THE

PRINCIPLES AND PRACTICE

OF

SURGERY,

FOUNDED ON THE MOST EXTENSIVE HOSPITAL AND PRIVATE PRACTICE DURING A PERIOD OF NEARLY FIFTY YEARS.

BY THE LATE

SIR ASTLEY COOPER, BART., F.R.S.,

SERGEANT-SURGEON TO THE KING,

FORMERLY LECTURER ON ANATOMY AND SURGERY AT GUY'S AND ST. THOMAS'S HOSPITALS, AND LATE CONSULTING SURGEON TO GUY'S.

Edited by

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PREFACE.

Events, over which mortals have no control, must plead as an apology for the delay of this Third Volume of our work. In January, 1841, circumstances of a private domestic nature occurred in the publisher's family, which materially retarded its progress; and on February 12th, 1841, the following month, we had the melancholy task to record the loss of our illustrious author, Sir Astley Cooper, in the 73rd year of his age, as deeply lamented as he was universally respected, leaving a space in the surgical world that will not be soon replaced—to his friends and relatives never. A brief memoir of his public life may not be unacceptable to the reader, which I have extracted from the address of his eminent cotemporary Sir Benj. Brodie, at a meeting of the Royal Medical and Surgical Society, soon after his demise. Sir Benjamin thus proceeds:

"There were none present who would not know that he alluded to the late Sir Astley Cooper, whose loss would not only be felt among his own immediate friends, but throughout society in general.

"Sir Astley had long occupied a distinguished station, and while he (Sir B. Brodie) was yet a student, had attained to great notice and distinction, and he advanced in reputation to the last; for although very much for many years in general practice, he never ceased to work for the good of the profession, and always with new claims to its respect and gratitude."
"Sir Astley was the fourth son of Dr. Cooper, a clergyman of independent fortune at Yarmouth, who acted as private tutor to his sons; but the subject of this memoir did not early exhibit any traits of industry or talent, but was rather distinguished as a spirited and enterprising lad; but an accident which occurred when he was sixteen years of age determined his future career. A boy (his foster brother) fell from a waggon and wounded his femoral artery: all his companions ran away, frightened by the effusion of blood, with the exception of young Cooper, who had presence of mind enough to tie his pocket-handkerchief round the limb, and this commanded the haemorrhage till a surgeon arrived. The applause he obtained for this act determined him on becoming a surgeon, and his father sent him to London under the care of his uncle, then surgeon to Guy's Hospital, but he was turned over as a private pupil to Mr. Cline; he had sufficient cause to regret this afterwards, as it necessarily abbreviated his preliminary studies at an age which might have been more profitably employed.

"It would appear, however, that Mr. Cline saw something uncommon in his idle pupil, and prognosticated that he would turn out well; for he told him at this period that he should teach anatomy in Guy's Hospital school, if he qualified himself for that duty. From this moment his careless and indolent habits were changed to those of unceasing industry and perseverance. In 1796, when twenty-eight years of age, he first began to deliver a course of lectures on surgery, having previously attended the lectures of John Hunter. But his first attempts at lecturing failed, owing to his endeavour to accomplish too much, and his class diminished. He then commenced a new system; he took notes of cases in the hospital and collected facts. His lectures then were pregnant with important practical knowledge, and he became an influential and popular lecturer.

"At the death of his uncle, Mr. Cooper, he was elected surgeon to Guy's Hospital in 1800; he was now placed in a position to rise to eminence. His career as a hospital surgeon was so
generally well known, that it would be unnecessary to dwell upon it: neither would he take up their time in enumerating his contributions to surgical literature, all of which were so familiar to the profession.

"In reviewing the history of Sir Astley Cooper, the first thing that attracts our notice is the perfect devotion with which he followed the science of his profession from the very beginning to the very end of his career. No other pursuit stood in competition with it; and we cannot doubt that his zeal was genuine, that he loved it for its own sake, without reference to it as an instrument for amassing a fortune, or acquiring distinction and importance in the world. Some years ago, when his health was impaired from severe mental and bodily exertions, continued during a long series of years, he retired, to lead the life of a country gentleman, on his own estate in Hertfordshire; but the experiment failed; and in less than a year he returned to resume his wonted employments. No alteration took place in this respect as he advanced in years; and the additions which he made to his anatomical museum, and his work on the structure of the female breast, bear honourable testimony to the zeal and activity of the latest period of his life. Even up to the time of his last illness, he was in the habit of rising at half-past six o'clock in the morning, and was generally engaged in some anatomical and pathological dissections for two or three hours, before he began what others would call the first business of the day.

"He was never without occupation, and having no desultory habits, he persevered steadily in any investigation that he had begun, until he had completed it as far as it was in his power to do so. It may be said of Sir A. Cooper, that he had but little indication of that inventive and discursive faculty which analyzes, combines, and abstracts, and which perceives and realizes remote relations and analogies; and to which we must attribute the great exploits of genius, whether it be in poetry or science. It may be said, also, that for the most part, he thought too rapidly for strict philosophical induction; that he was apt to draw a general con-
clusion from few facts, which nothing but an abundant evidence could justify. Such was the constitution of his mind, that it was better fitted to deal with facts, than with principles or theories; but in the former respect I have never known his equal.

'His museum was his study—nature was his book.'

"He was a minute and accurate observer, and his perception of facts was so vivid, and the attention which he bestowed on them so great, that almost every thing of any importance which he had ever seen, remained indelibly impressed on his memory. We all remember with what facility, when a remarkable case was presented to him, he could draw from the fund of his vast experience, similar or dissimilar cases, which he had seen years before, or differing in some respects only. He was scrupulously exact in his statements; no one could be more candid in the admission of his unsuccessful cases, and none could be more free from that weakness, to which even honest persons are liable, who make themselves believe, that facts are not facts, if they do not comport with their preconceived notions.

"At one period, Sir Astley was very much engaged in operative surgery, and an opinion had prevailed with many out of the profession, that skill in performing surgical operations was the greatest talent which he possessed. Some of the most absurd, vulgar, and for the most part, unfounded anecdotes, which have been published since his death, are calculated to give countenance to this opinion. Such calumnies as these carry their own refutation. I need not tell the Fellows of this Society, how great an injustice this is to the memory of our late Associate: perhaps the time is not far distant, when it will be a question, whether he was or was not an expert operator: but this we do know, that his published works will be studied as long as surgery is cultivated, and for this very reason, because they are replete with important facts, and containing the clearest rules of diagnosis, they will transmit his name to posterity with those of Sydenham and Hunter, as a great benefactor of the human race.
"Sir Astley Cooper enjoyed an unusual degree of popularity for a long series of years, especially among the members of his own profession. He owed much of this to the moral excellencies of his character. He was very considerate towards other practitioners: always ready to communicate whatever information he possessed, in a simple and familiar manner; he never attempted to obtain credit for himself at the expense of a fellow labourer. In his intercourse with others he was essentially kind-hearted, and possessed that degree of cheerfulness which made him acceptable to every one whom he met, without which it is impossible to obtain an influence over the minds of other men. He possessed another great advantage, in having no small degree of practical knowledge of human nature; by this, I mean, a clear and ready insight into the whole of the human character, and a knowledge of the qualities of the mind generally,—of the motives by which the actions of mankind are regulated. There is another point in Sir Astley's character, which I am induced to notice before I quit the subject, and I do so, because it gives me an opportunity of contradicting some unfounded statements which have been put forth respecting it. Although he derived from his practice a larger income than was ever obtained, either in the medical profession or in any other, he never exhibited any thing approaching to the vice of avarice. He was in the greatest degree liberal, and apparently careless as to the remuneration which he received. I say this with the utmost confidence, having never known nor heard of a single instance to the contrary, during my long acquaintance with him."

This may be the last opportunity which the Editor will have of adding a tribute of gratitude, in his own person, to that of Sir B. Brodie, for the many acts of kindness and liberality which he received from Sir Astley Cooper during the space of nearly thirty years; which is only adduced as one of thousands of a similar kind. Sir Astley was "essentially" kind-hearted, and the improvident or unfortunate student never applied to him in vain; he
was not only an eminent surgeon, but he was in the very best sense of the word a truly good man. "Satius, si ita tulisset fors, perire bene meritis referentem gratiam quam ingratum vivere."

The estimation in which he was held by the public was sufficiently displayed during his last illness by the daily anxiety which extended to every class concerning his recovery; but such was the nature of his disease, that no hopes could be entertained of him even from the first onset. The slightest exertion produced the most distressing dyspnoea, which was soon succeeded by livid spots on the lower extremities, which baffled all the skill of his able physicians, Drs. Bright and Chambers, and about one o'clock on February 12th, 1841, he breathed his last.

Thus terminated the existence of a man whose life had been spent in relieving others, and to whom those lines of the Roman orator may well apply: "Hominis ad Deos in nulla re proprius accedunt, quam salutem hominibus dando."

His funeral, although intended to have been strictly private, was attended by a vast concourse of respectable persons, whose deportment on that mournful occasion must have been very gratifying to his friends and relatives. According to his request, his remains were conveyed to Guy's Hospital, and deposited in a vault under the chapel.

By his will he bequeathes £4000 three per cent. consolidated Bank Annuities in trust to the Physicians and Surgeons of Guy's Hospital, the interest accruing therefrom, £300, to be awarded triennially for the best original Essay or Treatise on a given subject on Anatomy, Physiology, or Surgery—entitled the

Astley Cooper Prize.

A colossal statue of him is about to be placed in St. Paul's cathedral.

I cannot close this brief memoir of my friend and benefactor better, than by giving a few of his practical maxims, extracted from the life of Sir Astley, by his nephew, B. Cooper, Esq.
"My principle in practice was, never to suffer any one who consulted me to depart without giving them satisfaction on the nature and proper treatment of their case.

"Be kind to every one, and active to oblige.

"Bend the force of your mind to some useful object, and be not multifarious and vacillating in your pursuits.

"Deep science to the man of fortune—useful science to the physician and surgeon.

"Let your zeal be without limit in the pursuit of professional knowledge; these are the only secrets of my own success—do your duty, God will do the rest."

With respect to the contents of this third volume, I have endeavoured to render it worthy of that reception which the two preceding volumes have obtained. The treatment of syphilis has been brought down to the latest period, and, if I may allude (which I do with all due modesty) to the new treatment of gonorrhoea, I hope it will be found highly advantageous.

I have to offer my sincere acknowledgments to Dr. Copland, Messrs. Lawrence, Travers, Key, S. Cooper, Parker, and the Editors of the British and Foreign Review, for the use I have made of their works,—especially to L. Parker, Esq., for the selection of prescriptions from his excellent little work;—also to my son Alexander, for his share in the Anatomy and Physiology of the Eye;—and, in conclusion, I hope that all my errors, whether of omission or commission, may be taken, in extenuation, with a due consideration of the task which I had to execute.

A. LEE.

March 30th, 1843.
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THE PRINCIPLES AND PRACTICE

of

SURGERY.

THE VENEREAL DISEASE,

ITS ORIGIN AND HISTORY.

To trace the origin of any disease; to investigate the causes, remote or proximate, which first brought it into existence; to follow its subsequent course; to assign the causes which have operated during its progress either to aggravate or alleviate its virulence, must be a matter of some interest, at least; but at the same time it must be obvious to every one who has considered the subject in this light, that such an investigation is beset with difficulties of no ordinary character, involved as it is in more than Cimmerian obscurity.

Of all the "ills which flesh is heir to," few demand more serious attention than Syphilis, operating, as it does, in restraining the sensual passions of mankind morally, and physically as a punishment on those who violate the immutable and salutary laws of nature, inflicting an equitable portion of retributive justice on those votaries of Venus who break through Diana's pales.

Although it may not be a matter of much practical importance to the medical practitioner to enquire into the history and origin of Syphilis, and to examine how far the commonly received opinion may be correct; yet, as a subject of literary research, it is surely not undeserving of some consideration at our hands, and the more
especially, since it has occupied the attention of the first rate medical writers, and has been the cause of much controversy among medical men throughout Europe for nearly the last four centuries.

It would be as well to give some definition of this malady before we proceed in the investigation, in order that we may the more clearly understand the various terms which we shall have to make use of in the following remarks: for instance, under the general term of Venereal Disease, it is usual to include all that group of diseases which affect the male and female organs of generation, resulting from the indiscriminate intercourse of the sexes, and communicable by contact only. This forms, and is necessarily divided into two grand classes, namely:—Gonorrhoea, which according to its Greek derivation signifies a flux of semen literally; being compounded of two Greek words, γόνα, (goné,) semen, and ῥεῖν, (rheo,) to flow, therefore Πυρῷρεα, Puorrhcea, fluxus puris, vel suppuratio, would be a more correct term. The other division is termed Syphilis, from σπυρλαξ, filthy; or Lues Venerea. The first is strictly a local affection of the mucous membrane, the other is at first local, but afterwards constitutional.

Did this disease exist under any of those forms among the ancients? Let us first test the sacred records, and on referring to the Latin translation of the Bible by Tremellius and Beza, we find in the 14th chapter of Leviticus a minute and clear account of the manner in which the Jews treated persons affected with leprosy, which disease was prevalent in the Holy Land, and not to be confounded with another disease described in the 15th and next chapter, headed as follows:

Lex de immunditia viri gonorrhoea laborantis, de eo qui proprio semine se inficit, de muliere ordinarium vel extra ordinem fluxum patiente, et de ratione purgationis illorum.

The law of uncleanness of men labouring under gonorrhoea, having an issue of their semen—of women having an ordinary or extraordinary discharge, and the mode of purgation.

Ver. 2, cap. xv.—Alloquimini filios Israēlis, edicentes eis, unus-
VENEREAL DISEASE.

quisque quum est gonorrhœa affectus à carne sua, profluvio suo immundus est.

Speak unto the children of Israel and say unto them, when any man hath a running issue from his flesh, (gonorrhœa,) on account of his running he is unclean.

Ver. 3, cap. xv.—Haec autem esto immunditia ejus in profluvio ejus: si salvaverit caro ejus profluvium ejus, aut obstruxerit se caro ejus à profluvio ejus, immunditia ejus est.

And this shall be his uncleanness in his issue; whether his flesh run from him with his issue, or his flesh be obstructed by his issue, it is his uncleanness.

Ver. 4, cap. xv.—Omne cubile cui incubuerit gonorrhœa affectus, immundum esto: et omne instrumentum cui insederit, immundum esto.

Every bed whereon he lieth that hath a gonorrhœa is unclean, and every thing whereon he sitteth shall be held unclean.

Ver. 5, cap. xv.—Et quisquis tetigerit cubile ejus, ablutis vestimentis suis lavabitur aqua, &c.

Ver. 6, cap. xv.—Item qui insederit instrumento ulli cui insedit gonorrhœa affectus, ablutis vestimentis suis lavabitur aqua.

Ver. 7, cap. xv.—Item qui tetigerit carnem gonorrhœa affecti, ablutis vestimentis suis, &c.

Ver. 8, cap. xv.—Item quum exspuerit gonorrhœa affectus in aliquem mundum, is ablutis vestimentis suis lavabitur aqua.

Ver. 9, cap. xv.—Item omne sedile, cui insidens vehetur gonorrhœa affectus, immundum esto.

Verses 10, 11, and 12, contain similar injunctions, but varied according to circumstances. The 13th verse has the following passage, which every practical man must be familiar with, as it distinctly cautions the patient against a return of the discharge, which is not unfrequently the case.

Quum autem mundabitur affectus gonorrhœa à profluvio suo, primum numerabit sibi septem dies ad purgationem sui, et abluet vestimenta sua, deinde lavabit carnem suam aqua viva, ut sit mundus.
But when he that hath had a gonorrhoea shall be cleansed of his issue, let him first number to himself seven days for his purification, and wash his clothes and bathe his flesh in a running stream, that he may be clean.

That these discharges may not be confounded with nocturnal emissions, or the act of coition, let me adduce the following.

Ver. 16, cap. xv.—Item quisque quum exibit ex eo concubitus semen, is lavabit aqua totam carnem suam, et immundus erit usque ad vesperam.

And if any man's seed of copulation escape from him, then he shall wash all his clothes, and be unclean until the even.

That there were two distinct discharges is very clear, as they had to make two distinct offerings. Ver. 15, cap. xv.—Sacerdos parabit quorum, unum in peccatum et alterum in holocaustum: sic expiationem faciet pro eo Sacerdos coram Jehova à profluvio ejus.

And the priest shall offer two turtle-doves or two young pigeons; the one for an expiation of his sins committed in the flesh, that is for a sin-offering, and the other as a religious rite or burnt-offering.

These ordinances of Moses are summarily concluded by the 32d verse of the same chapter.

Ista est lex affecti gonorrhoea, ejusque ex quo exit concubitus semen quo fit immundus.

This is the law applicable to one who has a gonorrhoea, and also of that person who has an issue of semen.

There are some writers who have not hesitated to maintain the opinion, that the diseases which affected David and Job were nothing more nor less than syphilis; but however zealous I may be to prove the antiquity of the disease, I will never support such an hypothesis on such slender evidence.

From the sacred records we come next to the fons et origo of the healing art. Hippocrates, the father of medicine, ex lib. 3. Epidem. sect. 3, has certain passages which are quoted by some authors as descriptive of the venereal disease, since the various symptoms are mentioned there which usually attend the malady.

It should be admitted that Hippocrates is describing an unhealthy
season, and that those symptoms do apply to other diseases as well as to syphilis: which might be aggravated by an epidemic. Here is the passage alluded to as translated by Fœsius.

"Ante ver autem una cum frigoribus consecutis ignes sacri primiti, partim quidem aliqua de causa, partim sine ea contingebant, atque hi maligni quidem multos sustulerunt. Multi ex faucibus laborabant, vozes vitiatæ erant, serpentia ulcera oris, tubercula pudendorum, carbunculi,—urinae turbulentes, multæ, malæ reddibantur.—Atqui hi quidem morbi populariter vulgabantur. Ex enumeratorem autem generum unoquoque laborabant multi et moriebantur plurimi, eorumque singulis hunc in modum accedit.


Now this description given by Hippocrates is not incompatible with the venereal disease when first noticed by Europeans; since each physician gave to it whatever name he pleased.

Hence arises that almost infinite variety of words made use of to denote the venereal disease, varying according to the different origins from whence they sprung.

Vigo, an eminent Spanish surgeon, named it Las Bubas, Buvas, Buas or Boas; by the Genoese, Le male de le Tavelle; by the Tuscons, Il malo delle Bolle; the Lombards, Lo malo de le Brosule; the
French, *La Verole*, all of which signify pustules of different colours from the appearance it assumed about the latter end of the 15th century.

The Germans named it after certain saints, by whose assistance patients affected with it, had hopes of being cured: therefore they named it the disease of *St. Mevius* or *Tripper*; the Valentians and Aragonese, the disease of *St. Sementus*, the disease of *St. Job*, *St. Regina*, *St. Evagrius*, *St. Roche*, &c. The Italians call it the French disease, *Mal Francese*; while the French term it the *Neapolitan* or *Mal de Naple*; and the English the French Pox. Thus each nation brands its next neighbours with it, alleging that it was first introduced among them, either by the nation bordering next to them, or by one peculiarly connected in commerce.

Such a variety of terms for the same disease, caused much perplexity among physicians, as they were loath to designate it by any term that would be an opprobrium to other nations; which was the cause of some calling it *Pudenagra*, *Mentulagra*, till at last *Fracastorius* denominated this malady *Syphilis* in a poem which he wrote, wherein he derives its origin from the shepherd *Syphilis*, who was first afflicted with it for having offended the gods.

"Syphilidemque ab eo labem dixisse Colonos."

At last *Fernelius*, in order to remove all national reproaches, termed it the *Venereal Disease*, which should not convey any reflection upon any particular country, since it designated a disease contracted by venery. This example was soon followed by all other European physicians, so that for many years past it has gone by no other name than the *Venereal Disease*. By this it would appear, that each country had some peculiar name by which it was designated. In England, long before its irruption in the south, it was known by the *Brenning of the P—ntle*, and the vulgar denomination of those quacks who set up their pretensions to cure this disease were called *P—tle-Smiths*. The same malady was termed by the Scotch the *Sibbens* or *Sivvens*, and in some of the West Indian islands it was called the *Yans*. But for this digression on
its multiplicity of names, I hope the reader will pardon me; and I will now direct his attention to Celsus, where we shall find the evidence of its antiquity much more conclusive.

CELSUS DE MEDICINA.

LIB. VI. CAP. XVIII.

DE OBSCENARUM PARTIUM VITIS.


TRANSLATION.

DISEASES OF THE GENITALS.

1. We come now to the diseases of the private parts; the nomenclature of which among the Greeks is not only tolerable, but now fully sanctioned by practice; for they are freely employed in almost every volume, work, or treatise of the physicians: but with us Romans, these terms are certainly filthy, and never employed by any one who has a proper regard for modesty in language: therefore it is evident from this explanation, that there is no small difficulty in maintaining at the same time a delicacy of expression while delivering the precepts of the art.

Not that this circumstance ought to deter me from treating on them: first, because it is my intention to comprehend every thing in this work which I have
2. Igitur si ex inflammatione coles intumuit, reducique summa cutis, aut rursus induci non potest, multa calida aqua fovendus locus est: ubi verò glans contecta est, oriculario quoque clystere inter eam cutemque aqua calida inserenda est. Si mollita sic et extenuata cutis ducenti paruit, expeditior reliqua curatio est: si tumor vicit, imponenda est vel lenticula, vel marrubium, &c. —sursumque coles ad ventrem deligandus est, quod in omni curatione ejus necessarium est:isque homo continere se, et abstinere à cibo debet, et potione aquae tantum à siti vindicari.

Postero die rursus adhibendum iisdem rationibus aquæ fomentum est, et cum vi quo-
que experientium, an cutis sequatur: eaque, si non parebit, leviter summa scalpello concindenda erit: nam, cum sanies profluxerit, extenuabitur is locus, et facilius cutis ducetur.

Sive autem hoc modo victa erit, sive nunquam repugnaverit; ulcer vel in cutis uliioare parte, vel in glande, ultravem in cole reperiuntur: quæ necesse est, aut pura siccaque sint, aut humida et purulenta. Si sicca sunt, primum aqua calida fovenda sunt, deinde imponendum lycium ex vino est, &c.

Si levis iis humor inest, vino eluenda sunt: et seq.

Aut Erasistrati compositio, aut Cratonis, recte super purulenta naturalia imponitur.

Illud perpetuum est, post curationem, dum inflammatio manet, quale suprapositum est, cataplasma super dare, et quotidie ulcera eadem ratione curare.
HISTORY OF THE

Celsius.

Quod si pus et multum, et cum malo odore cœpit pro-
fluere, elui cremores lenticulae debet, sic, &c. Aut compo-
sitio Andronis, &c.

Si vero ulcus atque altius serpit, eodem modo elui 
debet: imponi vero, aut ëur- 
go, aut, &c.

Solet etiam interdum ad ner-
vos ulcus descendere; proflu-
itque pituita multa, sanies te-
nuis malique odoris, non coac-
ta, at aquæ similis, in qua caro 
recens lota est; doloreseque is 
locus, et punctiones habet. Id 
genus quamvis inter 
puerulenta est, tamen lenibus 
medicamentis curandum est; 
quaë est 
emplastrum tetraaphæræxæn 
ex 
rosa liquatum, &c.

Interdum autem per ipsa ul-
ceræ colae sub cuti exesus est, 
sic, ut glans excidat. Sub quo 
casu cutis ipsa circumcidenda 
est. Perpetuumque est, quot-
ties glans, aut ex cole aliquid, 
vel excidit, vel absconditur, 
hanc non esse servandam, ne 
considat, ulcerique agglutine-
tur, ac neque reduci possit 
the ulcers daily in the same man-
ner.

But if the pus have commenced 
to flow copiously, and its odour 
be offensive, it ought to be wash-
ed out with the cream of lentils, 
or with the composition of An-
dro. But if the ulcer extend in 
breadth and depth, it ought to be 
wasbed in the same manner, and 
either to apply verdigris, or, 
&c.

Sometimes these ulcers pene-
trate to the nerves, and a great 
discharge takes place, of a thin 
sanies, and foetid odour, of no 
consistence, but more like water 
in which fresh meat has been 
ashed; and that it is attended 
with pain and pricking. Now 
although this is among the puru-
lent kind of ulcers, yet it must 
be treated with mild applications, 
such as the Tetrapharmacum plas-
ter dissolved in rose-oil.

Not unfrequently has the pe-
nis been destroyed to that de-
gree under the prepuce, by these 
very ulcers, that the glans has 
fallen off. In this case the pre-
puce itself must be removed by 
circumcision. Therefore it is 
an invariable rule, whenever the 
glans, or any part of the penis, 
has sloughed off, or has been cut
VENEREAL DISEASE.

postea, et fortasse fistulam quoque urinæ claudat.

Tubercula etiam, quæ φιματα Græci vocant, circa glandem oriuntur: quæ vel medicamentis, vel ferro aduruntur; et cum crustæ exciderunt, squama æris inspertiur, ne quid ibi rursus increscat.

3. Hæc citra cancrum sunt; qui cum in reliquis partibus, tum in his quoque vel præcipue ulcerata infestat.

Incipit à nigritia: quæ si cutem occupavit, protinus specillum subjiciendum, eaque incidenda est; deinde oræ vulsella prehendendæ, tum, quidquid corruptum est, excidendum, sic, ut ex integro quoque paulum dematur, idque adurendum. Quoties quid ustum est, id quoque sequitur, ut imponenda lenticula sit; deinde, ubi crustæ exciderunt, ulcera sicut alia currentur.

away, the surrounding portion of the prepuce is not to be retained, lest it come in contact with the ulcer, and there become united to it, so that its reflection would become impracticable afterwards, or it might even close the urinary canal.

Tubercles, or warts, also, which the Greeks call phymata, arise about the glans: these are to be burnt, either by caustics or the actual cautery: and when the eschars have fallen off, copper-rust is to be sprinkled on to prevent their reproduction.

3. In the preceding ulcers, I have said nothing of chancres; to which all parts of the body are liable, but more particularly ulcers of the genitals. The disease begins with a blackness; and if this seize the prepuce, a probe must be passed immediately under it, and an incision made; afterwards, the edges are to be seized by the forceps, and then, whatever is diseased must be cut away, so that even a small portion of the sound part may be taken, and the part cauterized. Whenever a part is burnt, it follows as a matter of course that lentils are to be applied; afterward, when the eschars have
At si cancer ipsum colem occupavit, inspergenda aliqua sunt ex adurentibus, maxime-que id, quod ex calce, &c.—Si medicamenta vincuntur, hic quoque scalpello, quidquid corruptum est, sic, ut aliquid etiam integri trahat, praecidi debet. Illud quoque perpetuum est; exciso cancro, vulnus esse adurendum. Sed sive medicamentis, sive ex ferro crustae occaluerunt, magnum periculum est, ne his decidentibus, ex cole profusio sanguinis insequatur.

4. Nonnunquam etiam id genus ibi cancri, quod Ψαγιδάνα à Græcis nominatur, oriri sol-let. In quo minime differendum, sed protinus iisdem medicamentis, et, si parum valent, ferro adurendum. Quaedam etiam nigrities est, quæ non sentitur, sed serpit, ac, si sustinuimus, usque ad vesicam tendit; neque succurri postea potest. Si id in summa glande circa fistulam urinæ est, prius in eam tenue specillum demittendum est, ne claudatur; de-

fallen off, they may be dressed as other ulcers.

But if a chancre have taken place on the penis itself, some of the caustics are to be sprinkled on, and especially that which is composed of lime, &c. If the applications are unavailing, here also whatever is diseased ought to be cut away, even to a portion of the healthy part. This is also an invariable rule, that when a chancre is excised, the wound must be cauterized. But if these eschars have become indurated, either by the application of caustics, or by the cautery, there will be great danger of hæmorrhage from the penis, after they have sloughed off.

4. There is also a species of ulcer formed there sometimes, which the Greeks call Phagedena. Here no time must be lost, but the same caustic remedies must be immediately applied, and if they avail not, the part must be burnt by the actual cautery.

There is also a certain blackness, destitute of sensation, but which creeps onward, and if we do not arrest it, extends to the bladder, when it becomes incurable afterwards. If this take place on the glans near the ure-
inde id ferro adurendum; si vero alte penetravit, quidquid occupatum est, præcidendum est. Cetera eadem, quæ in aliis cancris, facienda sunt.

5. Occallescit etiam in cole interdum aliquid; idque omni pene sensu caret: quod ipsum quoque excidi debet, &c.

8. Condyloma autem est tuberculum, quod ex quadam inflammatione nasci solet. Sed si vetus condyloma jam induruit, neque sub his curationibus desidit, aduri medica- mento potest, quod ex his constat, &c.

11. Fungo quoque simile ulcus in eadem sede nasci so- let, &c.

Having drawn so largely from Celsus in support of the antiquity of the disease, induces me to pass over those antecedent to him, and just give a cursory glance at those of a later date previous to its irruption in Italy.

We find in Pliny, book 6, epist. 24, that a married man had been long ill of putrid ulcers about the private parts; his wife desired to examine them, looking on herself as the most proper judge whether it was possible to cure them or not. She saw them, and despaired of curing them, and consoled him to meet his approach-

Celsus.
ing death; nay, she attended him at his death, encouraged him to resign his life, set him the example, and even forced him to it, for she tied herself to him, and threw herself into the Lacus Larius with him.

Galen also, lib. vi. De locis affectis, cap. 6, mentions cancerous sores on the genitals.

Flavius Josephus, the Jewish historian, relates the case of one Apion who was afflicted with an ulcer on the penis, of which, after several incisions to no purpose, he died in exquisite torments, the genitals having sloughed off.

Again, in lib. xvii. cap. 8, he says, that Herod king of the Jews died of this disease, his private parts being eaten up.

Eusebius, Bishop of Cesarea, lib. viii. cap. 16, says Galerius Maximus died a miserable death from an ulcer in the private parts, the disease proving incurable, and the parts affected abounding with worms, and emitting an intolerable stench.

Lucretius, lib. vi. De rerum Natura.

"Profluvium porro qui tetri sanguinis acre
Exierat, tamen in nervos hinc morbus et artus
Ibat, et in partes genitales corporis ipsas:
Et graviter partim metuentes limina lethi
Vivebant, ferro privati parte virili."

There was also a severe discharge of corrupted blood; the disease, however, invaded the sinews, the joints, and very genitals of the body itself; and some dragged on a miserable existence, fearing the near approach of death, deprived as they were of their virility by the knife.

In the first book of Herodotus entitled Clio, he relates, that the Scythians, who made war upon Palestine and desecrated the temple of Venus Urania, at Ascalon, upon which the goddess inflicted a disease on those who plundered and violated her temple, and their posterity, entitled βρελειαν τοῦτον, a feminine disease, and all persons labouring under this distemper, were called by the Scythians ἰναγίας or ἰναγίας, execrable. All the commentators say that this was a gonorrhoea.
Suetonius says of Augustus Caesar, "Corpore traditur maculoso, dispersis per pectus atque alvum genitivis notis, in modum et ordinem ac numerum stellarum coelestis ursæ; sed et callis quibusdam, ex prurigine corporis assiduoque et vehementi strigilis usu plurifariam concretis, ad impetiginis formam." That his body was spotted all over with natural marks on the breast and belly, resembling the constellation Ursa Major, also certain callosities like impetigo, with violent itching from the constant and vehement use of the flesh brush.

Tacitus, speaking of Tiberius, says that he retired in consequence of the loathsome appearance of his head and face, being full of pustules and besmeared with ointments.

It is well known that the Emperor Tiberius was infamous for his debaucheries in his old age.

Palladius, Bishop of Helenopolis, mentions a certain person named Ero or Hieron, who being both glutton and drunkard, and much addicted to venery, formed an improper connexion with an actress while at Alexandria, was visited by the just judgment of heaven with a carbuncle on the glans penis, which made such rapid ravages, that in a fortnight's time the whole of his genitals were destroyed; from which it appears he recovered, and afterwards became a miracle of penitence and piety.

There are certain passages in Horace quoted to support the antiquity of the disease. Such as,

"Contaminato cum grege turpium
Morbo virorum."—Lib. I. Od. 37.

And again,—

"Fœda cicatrix
Setosam lævi frontem turpaverat oris."—Lib. I. Sat. 5. v. 61.

Astruc, although the most uncompromising and industrious advocate for the modern theory, furnishes abundant testimonies in support of its antiquity; amongst others are the following.

Domnus Augustine Calmet, a Benedictine Friar, in his learned Commentaries on the Bible, inquiring into Job's disease, he thence takes occasion to speak of the venereal disease, which he imagines to be the same with that of Job. Hence he affirms, that the
venereal disease must be of very ancient date; and to strengthen this opinion, he introduces a passage from Lucian's *Pseudo-Logista*, where he speaks *De Morbo Lesbio*, which he is ashamed to translate; so am I; but he says, "lest I be blamed for being too scrupulously delicate, I shall set them down in their own words as follows:—

"Quod etiam miror te cum Apophradem audisti, ægere tulisse; nihil vero ad illa Nomina indignari. Nam in Syria *Rhododaphne* vocatus es; sed quamobrem? Ita me Minerva amet, pudet discere: quare quantum in me est, obscurum illud maneat. In Palestina vero *Sepes*, ob barbæ spinositatem opinor, quoniam inter opus pungere soletabat, nam adhunc radebas. In *Egypto* vero *Aegina*, quod *per se* manifestum est. Nam aiunt te fere suffocatum esse, cum in nautam ex iis, qui naves tribus velis instructas ducunt, incidisti, qui cum in te irruisset, os tibi obturavit—cum igitur talibus tantisque nominibus sis locupletatus, pudet te *Apophradis*. Per Deos itaque dic mihi quomodo afficeris, cum illa quoque dicunt plerique *λεοβίδας* et *φομίλες*. Num et hæc, perinde ac *Apophradem*, ignoras, et te ab ipsis laudari putas."

Another equally indelicate from Ausonius Epigrammate 71. in *Crispam*, impudicam Mulierem, where he mentions the *Nolanus Luxus*.

"Præter legitiimi genitalia federa coetūs,
Repperit obscenas veneres vitiosa libido;
Herculis hæredi quam Lemnia suasit egestas,
Quam toga facundī scenis agitavit Afrani,
Et quam Nolanis capitalis luxus inussit.
Crispa tamen cunctas exercet corpore in uno,
Deghibit, fellat, molitur per utramque Cavernam,
Ne quid inexpertum frustra moritura relinquit."

Another quotation from Suetonius runs thus. "Verum tantam infirmitatem corporis magnà curâ tuebatur Augustus, in primis lavandi raritate. Ungebatur etiam *sæpius et sudabat* ad flammam, deinde perfundebatur egelidā aquā, vel sole multo calefacta."

Now it is the opinion of Friar Calmet, that the *Morbus Lesbius*...
of Lucian, and the Nol anus Luxus of Ausonius, is nothing more nor less than the venereal disease, and that the anointing and sweating of Augustus before the fire, was only in strict accordance with our own practice of rubbing-in.

At an early part of this sketch I alluded to the gonorrhoea of the Jews, or primary form of the disease; now I will direct the inquisitive student to some other passages in the Sacred Records descriptive of lepra, but by many modern writers of good authority said to be the sequelæ of syphilis, and in support of this argument they adduce the incontrovertible fact, that from the period when the secondary symptoms of syphilis began to be described, lepra began to disappear.

In the 12th chapter of Leviticus, Moses describes the lepra common among the Jews by the name of Tsaharoth; and which was common enough in Judæa, even in the time of our Saviour, as the Evangelists mention several lepers who were perfectly cured by him; and in support of this opinion the following passages are cited.

Levit. chap. xii. ver. 2.—When a man shall have in the skin and flesh a rising, a scab, or bright spot, and it be in the skin like the plague of leprosy; then he shall be brought unto Aaron the priest, or to one of his sons. Ver. 3. Then the priest shall look on the plague in the skin, and if the hair in the plague be turned white, and the plague in sight be deeper than the skin and the neighbouring flesh, it is the plague of leprosy; and the priest shall pronounce him unclean. See also verses 9, 10, 11, 44, 45, and 46.

Similar accounts may be obtained in the works of the Greek physicians who lived after Celsus, such as Galen, Oribasius, Paulinus, Aetius, and Actuarius; also the Arabians, as Avicenna, Hali, and Rhazes, who mentions an ulcer of the penis produced by the accensionem mulieris supra virum; and Avicenna also mentions a case of an ulcer on the penis with ardor urinæ, as by no means uncommon, which he ascribes to be contracted by coitus with a leprous woman.
The complaints of Job, who was covered with sores from the soles of his feet to the crown of his head, were ascribed to Satan by divine permission, and by some supposed to be identical with syphilis.

In chap. vii. ver. 5. My flesh is covered with putrid sores.—Chap. xxx. ver. 17. My bones are pierced with pains in the night time, and my destroyers take no rest, et seq.

The royal psalmist David, too, comes in to aid the antiquity of the disease.

Psalm xxxviii. ver. 4.—Non est integritas in carne mea, propter detestationem tuam, non est pax in ossibus meis, propter pecatum meum.

There is no soundness in my flesh because of thine anger; there is no rest for my bones, on account of my transgressions.

Ver. 6.—Putruerunt, contabuerunt tumices mei, propter stultitiam meam.

My wounds or sores stink and are corrupt, because of my folly.

Ver. 8.—Quia ilia mea plena sunt vilitate, adeo ut non sit ulla integritas in carne mea.

For my loins are filled with a loathsome disease, so that there is no soundness in my flesh.

There is another passage in the 19th chapter of Ecclesiast. to the same effect, viz.

Ver. 3.—Whosoever joineth himself to whoremongers and adulterers, shall become impudent. Rottenness and vermin shall have him as a heritage.

Solomon in his Proverbs, chap. v. ver. 8, &c., admonishes his son to remove his ways far from a strange woman, and come not nigh the door of her house, lest thou give thine honour unto others, and thy youthful years unto the lewd, lest strangers be filled with thy wealth, and thy labours be in the house of a stranger, and thou mourn at last, when thy flesh and thy bones are consumed.

The Acta Sanctorum, which was collected in the year 1010, furnishes two cases of the venereal disease, clearly proving that
it was known nearly five hundred years previous to the siege of Naples. It is there related, tom. iii. p. 90, that some persons were grievously afflicted with this disease, and having made a vow, (voto facto,) they implored the aid of St. Benno, whereby they were entirely cured. The other will be found in tom. v. p. 361, in the life of St. Columba, where it is said that a certain youth named Vincentius, was so afflicted with this disease that he fell into despair, but being brought into the chamber of St. Columba by his friends, was freed from his disease.

These two cases are adduced merely as miracles of those saints, nor is the reader called upon to attach more implicit credence to them than I do: that is not much.

We come now to the writers of the 13th century.

Guillelmus de Saliceto, a physician of Placenza, lib. i. cap. 42. De Apostemate in Inguinibus. He says this disease is called a bubo, dragoncelli, or impostume of the groin; sometimes it arises from a foulness of the penis, contracted by lying with a dirty woman, or from some other cause. Again, cap. 43, concerning the white or red pustules, miliary eruptions, fissures, and gangrenes, or the like, which take place on the penis, or about the prepuce, after coition with a foul woman, or a common prostitute, or from any other cause.

I cannot part with William De Saliceto without making another extract, which every young practitioner would do well to have stereotyped on some tablet of his brain. It is thus: "Ne delectetur familiaritas Laicorum. Nimia autem familiaritas contemptum parit, et etiam per nimiam familiaritatatem non sic audacter et securè petitur. remuneratio operationis condcenter. Et scias hoc unum, quod bona remuneratio de labore, et salarium optimum redit medi-cum authorisabilem, et confortatur fides infirmi super ipsum."

Bernard Gordon, Prof. of Med. in the University of Montpelier, in his work De Passionibus Virgæ, published in 1305. The diseases of the yard, says he, are numerous, such as impostume, ulcerations, cancers, inflation, pain, and itching. The causes of these are either external or internal. External, as falls, blows,
and lying with a woman whose womb is foul, full of putrid sanies, virulence or flatulence, and the like.

About the same date, that is, 1320, flourished Dr. John of Gaddesden, of Merton College, Oxford, author of the famous Rosa Anglica, wherein, Cap. De Cura Ulcerum Virgæ, ulcers of the penis, he says, happen either from coition with a maid, or with a woman whose menses are upon her—or from the retention of the urine or semen.

According to Dr. Freind, this said John of Gaddesden was the first English physician who was admitted to attend on royalty, Edward the Second, for a brenning of the pintle, for which he ordered a woman's milk, who was suckling a first-born male child, for an injection into the urethra.

Dr. Freind, in his History of Medicine, places Lanfranc in Paris in the year 1296, and in his Practicæ seu Artis complectae Chirurgiae, cap. 11, he states that there frequently happens an impostume in the groin from ulcers on the penis, &c. And a chancre is produced on the penis in the same manner as we have related in other parts of the body. Ulcers are produced from hot pustules growing on the penis, which afterwards burst; or from coition with a foul woman, who has had lately to do with a man whose penis was ulcerated.

Our next authority is Guido of Guienne, Professor of Surgery at Montpelier in 1363. In Chirurg. Mag. Tract. cap. 7. sect. 9, he treats of foulness of the penis by lying with a foul woman. Fallopius compared him to Hippocrates.

Next in order is John Arden, who removed from Newark to London in 1370, as Freind says, a surgeon of no mean figure in those days. He imparts to us several methods of treating ardor urinae or chaude pisse of the French, and he frequently mentions abscesses and scirrhous tumours, and particularly those which come on the penis.

In 1396, Valescus de Taranta, Professor at Montpelier, in his work Philonii, lib. vi. cap. 6, De Ulceribus et Pustulis Virgæ, says the causes may be either primitive, antecedent, or conjunct.
Primitive, as a wound, friction, or coition with a foul, nasty, or cancrinous woman. Again he says, pustules break out upon the penis, from coition with a woman who has an ulcer in the matrix or vagina, which infects the penis with its contagion, and occasions an ulcer upon it. And lastly,

Peter de Argelata, of Bologna, Tract. 30, cap. 3. De pustulis quæ adveniunt virgæ propter conversationem cum fœdâ muliere, quæ albæ vel rubæ sunt. After having prescribed lotions and styptics, he insists particularly on purgatives, for, as he says, the matter being retained in the system, a bubo is generated, and frequently suppurates. Therefore the patient ought to be thoroughly purged. But your unskilful physicians, either from being too sanguine in their hopes, or from neglect, do not purge at all, whereby they become doubly gainers, both by gonorrhœa and bubo.

Again, those persons, instead of discussing the bubo, as they ought to do, bring it to a suppuration, in order to gain the more by it, which ought never to be done by an honest physician or one who understands his profession.

I have now adduced many authorities in favour of the antiquity of the venereal disease to a period approaching the grand climacteric in Naples; and the practical reader may say satis est; I am inclined to think with Mr. Bacot, who has written an excellent treatise on this disease,—but touching its origin we are diametrically opposed to each other.

Respecting the history of syphilis, he says, "two questions have particularly attracted the attention of authors—the first relates to the antiquity of the disease—the second to its origin. It may be thought, perhaps, by some, that this discussion is superfluous, and that it can have no other result than that of affording an opportunity of heaping quotation upon quotation, and obtaining the reputation of a little reading at the expense of a great deal of time; but I trust that it will be admitted, upon reflection, that this enquiry is one of absolute necessity, tending to complete the character of the liberal-minded and well-informed practitioner, to
whom no species of knowledge should be wanting—who should never be content, until he is enabled to give a satisfactory solution to all the suggestions or doubts that may arise in his mind upon this or any other subject on which he may be engaged. It is by means of this knowledge, that he will be enabled to obviate objections and surmount difficulties; or to avoid the imputation of plagiarism, by fancying he is suggesting something new, when, in fact, he is only relating or reviving what has been said or done a thousand times before.”

That this disease was known and recognised by statute legislation long before the siege of Naples, is sufficiently apparent by the appointment and regulations of

THE PUBLICK BROTHELS ESTABLISHED AT AVIGNON IN 1347.

I. On the 8th of August, in the year 1347, our good Queen Jane gave leave that a public brothel should be set up at Avignon, and ordered that the wenches who plied there should not walk the streets, but keep themselves confined within the brothel, and by way of distinction wear a red knot on their left shoulders.

II. Item, If any girl has thus offended, and persists in her offence, that then the claviger, or chief of the beadle, shall lead her through the city by beat of drum, a red knot hanging at her shoulder, back to the brothel, and shall prohibit her from walking abroad any more, under penalty of being lashed privately for the first offence, and of being whipped publickly and turned out of the house for the second.

III. Our good Queen orders that this brothel shall be erected in Broken Bridge Street, near the convent of the Augustine friars, as far as to St. Peter’s gate; and that the entrance shall be towards the street, and the door locked, that no youth may have admittance to the wenches without leave from the abbess or governess, who is to be chosen every year by the directors. The abbess is to keep the key, and advise the young men she admits to make no disturbances, nor frighten the wenches, and to let
them know that in case of misdemeanour they will not be suffered to go off securely, but be laid under confinement by the beadle.

IV. The Queen commands that on every Saturday the women in the house be singly examined by the abbess and a surgeon appointed by the directors, and if any of them has contracted any illness by their whoring, that they be separated from the rest, and not suffered to prostitute themselves, for fear the youth who have to do with them should catch their distempers, &c.

In this document we have the most conclusive evidence of the existence of the venereal disease at least one hundred years previous to the discovery of America or the siege of Naples, which is of itself sufficient to refute the arguments of those who contend for its modern origin; and without any further comment I will adduce the opinion of one of the most profound medical philosophers of the present age.

In the published lectures of Wm. Lawrence, F.R.S., Senior Surgeon and Lecturer on Surgery at Bartholomew's Hospital, speaking of syphilis in his introduction he says:

"It has long been considered that syphilis was unknown to the ancients; at all events, there is no clear description given of the disease, prior to the end of the fifteenth century. There are scattered notices of ulcerations occurring on the genitals, both in the older medical writers, and in various other authors who flourished before the time I have mentioned; but we do not find in any of them a description of the disease at all according with the view now taken of it by ourselves, and in particular, there is not an account of what we call secondary or constitutional symptoms in any one instance prior to the very end of the fifteenth century.

"Now about that period two remarkable events took place. The first of these was the discovery of what was called the New World by Columbus, who returned from the island of St. Domingo to Spain in 1493, after discovering the West Indian islands; the other event to which I have alluded was the invasion and conquest of Naples by Charles VIII., king of France, who entered
that city in the year 1495. Now the origin of syphilis has been pertinaciously referred to one or other of these two events.

"Many have believed that syphilis was a disease originally epidemic in the West Indies, in the part that was first discovered by Columbus—the Island of Hayti; that it was brought to Europe by the companions and followers of that navigator, and was thence disseminated over this part of the world. For my part, I can see no evidence to establish that opinion—in fact there is no evidence at all of the disease having existed in the island at the time Columbus discovered it: certainly there is no account of such affection given in the original narrative of the expedition of Columbus, nor in the earliest accounts published of what was seen and observed there: and the idea of the origin of venereal disease in the West Indies, in the way that I have mentioned, is first suggested by writers who went to St. Domingo at least twenty years after it was visited by Columbus.

"Farther—we find, on examining the historical evidence upon this subject, that there are unequivocal traces of the existence of the venereal disease in Europe some years prior to the discovery of Hayti by Columbus. We meet with passages in the writings of authors who lived eight or ten years before that time, which show that the venereal disease was then not unknown. There is, in particular, a passage from a letter from Peter Martyr, who filled an important situation in Spain, dated 1488, (before the time that Columbus made the discovery,) which affords unequivocal proof that the venereal disease was known at that time. If the venereal disease had been found by Columbus and his crew in St. Domingo—if they contracted it and brought it back to Europe, we should expect to find that it had first existed in Spain, and that it had extended from Spain over the rest of Europe. Now we do not find that such was the case. If we consider that the venereal disease first originated at the time alluded to, it appears that it had broken out in Italy or France, not in Spain; and the name by which the disease was known in the first in-
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stance, points out this circumstance clearly. The name that was first given to the venereal disease, and which, in fact, it has retained up to the present day, is morbus Gallicus—the French disease. It was called by the Germans the French pox; that was the familiar expression in this country, and is known up to the present time. The French do not seem to have liked this name, and they called it the Neapolitan disease. But at all events, it was known by one or other of these names—nobody thought of calling it the Spanish, or the Haytian disease—they gave it no name that denoted its origin to have been either in Spain or in the West Indies.

"I conceive, therefore, that we may reject entirely the idea of the venereal disease being originally epidemic in the West Indies, and being imported by Columbus and his crew into Europe. If we reject the hypothesis of the West Indian origin of the disease, we may next inquire whether there is any clear proof that the disease broke out at Naples or Italy at the invasion of that country by the French, and whether it was conveyed by the military who accompanied Charles VIII. to France and the northern parts of Europe? I cannot say that it seems probable that the disease should have occurred at that era of the world: we cannot trace out any peculiar circumstances in the state of those countries at the time, that would throw light on the origin of this strange affection. Hence we cannot be surprised that many of those who have examined the historical evidence upon this subject, have come to the conclusion that syphilis existed before either of these events. The circumstance of its not being accurately described may have arisen from persons not having observed it with great attention—not having taken cognizance of its symptoms, not sufficiently understood those which we now know to be connected with each other. At this distance of time it is difficult for us to arrive at satisfactory evidence upon the subject, and it is not important that we should—it is only a question of curiosity. For my own part, I cannot help entertaining the opinion that the venereal disease existed long before the events that I have now al-
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Lawrence.

cluded to; in fact, that it is just as old as the promiscuous intercourse of the sexes, which we now find to be constantly connected with it. There is no instance that we know of in which promiscuous intercourse takes place, that the venereal disease does not exist; at all events, this shows itself clearly as an important circumstance in aggravating and extending the disease. The greatest difficulty in the way of this belief is the silence of the old writers on a subject which to us appears so extremely important: we must consider, however, that both in the writings of the ancients, and of the more modern authors who wrote shortly before the end of the fifteenth century, we find various passages in which ulceration is mentioned as existing on the generative organs of both sexes. We find mention made of buboes, and we find clear evidence that a belief existed that such appearances could be communicated from one individual to another by sexual intercourse.

"There is a curious document published by Astruc, who is the author of a work in which he collected together all that was known respecting the venereal disease at the time he wrote. He gives a curious document, which shews that at a period long anterior to the discovery of the West Indies, or the invasion of Naples, the possibility of communicating the disease in this way was recognised, and even made the basis of legal provisions. The document I allude to is an ordinance published by Johanna, Countess of Provence, and Queen of the Two Sicilies, in 1347. She seems to have exercised a very maternal kind of care over the subjects committed to her charge, for this ordinance establishes a public brothel, and lays down regulations for its conduct and management. It seems strange that a young queen should undertake a business of this kind; but the truth is, in foreign countries there were various similar establishments recognised by law; and in this moral town itself, about the same time that Queen Johanna granted this privilege, there was a public brothel in Southwark, under the care of the Bishop of Winchester, and the regulations and laws relating to it are still extant. Now the document of Queen Johanna sets out with ordering that all the girls who re-
sorted to the establishment should wear a red epaulette or shoulder-knot on the left shoulder; she then points out in what part of the town it should be situated, and what is singular, she directed that it should be placed near the convent of the Augustine friars—a situation that she perhaps thought would be convenient for the inmates of both establishments. But the important regulation is the fourth: she there directs that every Saturday a barber, deputed by the consul of the town, should examine all the girls in the establishment, and if it was found that any of them had contracted illness "by fornication," that they should be set apart from the rest, and not allowed to exercise their calling, lest the young men should contract the disease. It thus clearly appears that a knowledge existed that this particular kind of disease could be communicated from one person to another previous to the period that has generally been supposed to be the epoch of its origin. This document is dated 1347—you will find it in the work of Astruc; and I may say, generally, that if you feel a curiosity in investigating minutely this part of the history of syphilis, you will find a collection of all the documents regarding it in that work.

"I do not lay so great a stress upon the silence of the older writers, as some of those do who have considered the subject. It does not appear to me very extraordinary that they should not have given a clear description of the venereal disease: they may not have understood the nature of it, they may not have understood the various relations in which the different symptoms are to be viewed. Supposing we saw a person with a certain eruption, we should not know (unless previously informed) that the eruption arose from a sore the patient had had weeks or months before. It may be then, that a long time may have elapsed before the relation of the symptoms to each other was comprehended. We find many instances in the history of our art, where things, that appear to us most obvious, must have been overlooked for a long time. Although a knowledge of the small-pox existed for centuries, yet people were ignorant that that disease was contagious; this is only
a circumstance of modern knowledge. The small-pox, measles, and scarlet fever, were confounded together for centuries, and no distinction was made between these three affections till a comparatively recent time; indeed, between the measles and scarlet fever, no distinction was made till about the middle of the last century. That the mere silence of persons who have written on a subject respecting some parts of its history, does not prove that what they omitted to notice did not exist, we have clear evidence from other considerations. Now Mr. Hunter, who must be deemed to have been a man of great knowledge, took much pains in investigating the venereal disease: the late Mr. John Pearson was a man of extensive learning, and he also laboured in the examination of the subject, but neither of those gentlemen was acquainted with gonorrhœal ophthalmia, or syphilitic affections of the eyes, in which organs the disease has always been strongly marked. Now if persons, two or three hundred years hence, were to argue that such diseases did not exist now, because these gentlemen had not mentioned them, they would come to a very wrong conclusion. In the same way, I apprehend, we should adopt an erroneous supposition, if we imagined that the venereal disease did not exist in ancient times, because the medical writers of those times have not given a clear description of it."

The following regulations will be found in the History of Saint Saviour's Southwark, which has been alluded to in a previous part of this sketch concerning

THE STEWS OF SOUTHWARK.

Near the Bear Garden, on the Bankside, was formerly the Bordellow, or Stews, so called from several licensed houses for the entertainment of lewd persons of both sexes. These were subject to several laws and regulations, and their manner of life and privileges received many confirmations from the crown. The distance of time precludes our attempting to ascertain, with any degree of certainty, the foundation of these places, since, in the
reign of King Henry the Second, and in the year 1162, we find in a parliament held at Westminster, an act passed for confirming several ordinances, statutes, and old customs, observed in that place. From the word 'old,' it is a reasonable conjecture, that they were then of some antiquity, and that the parliament at that time gave a legal sanction to those regulations which custom had previously established, some of which are inserted from Stowe's Survey of London, viz.:

"That no stew-holder, or his wife, should let or stay any single woman to go and come freely at times, when they listed.

"No stew-holder to keep any woman to board abroad at her pleasure.

"To take no more for the woman's chamber, the week, than fourteen pence.

"Not to keep open his doors upon holy dayes.

"Not to keep any single woman in his house on the holy dayes, but the bayliffe to see them voided out of the lordship.

"No single woman to be kept against her will, that would have her sinne.

"No stew-holder to receive any woman of religion, or any man's wife.

"No single woman to take mony to lye with any man except she lye with him all night till the morrow.

"No man to be drawn or enticed into any stew-house.

"No stew-holder to keepe any woman, that hath the perillous infirmity of burning; nor to sell bread, ale, flesh, wood, coale, or any victuals, &c."

Upon a short review of their subsequent protection, it appears that, in the year 1345, King Edward the Third confirmed to them the privileges they then enjoyed, and, as some say, directed a badge or dress of distinction to be worn by the women inhabiting that place; that in the year 1381, the stew-houses were the property of William Walworth, the then Lord Mayor of London, by whom they were let out to Flemish women, or, as they are by some termed, the froes of Flanders. In the fifth year of the reign of
Richard the Second, a discontent arose among the people on account of the heavy taxation with which they thought themselves grieved; and a collector of the poll-tax at Dartford, in Kent, having, under pretence of strict attention to his duty, offered an insult to the daughter of one Walter Tyler, it so exasperated the father, that by a single blow with the weapon he then held in his hand the collector was killed, the tax being obnoxious, and the collector's behaviour intolerable, (having in addition to the insult offered the daughter, used both ill language, and first struck the father,) the people became strongly attached to Wat Tyler, who took upon himself to be their leader; and after increasing their number in various parts of Kent, they marched with him to London. Among other objects of their fury, (William Walworth, the mayor, having shut the city gates,) they determined to destroy the stews, probably not so much from a principle of reform, as from a passion of revenge, which Wat Tyler concluded could not be more effectually done than by cutting off so large a branch of his lordship's revenue. It is pretty well known that Wat Tyler finished his career in Smithfield, and that William Walworth dispatched him, and with as little ceremony as Tyler had formerly done the collector at Dartford. This act is by some writers attributed to Walworth's revenge for the loss of the stews, but his situation at the time, his being the lord mayor of London, with the occasion and the dignity of his office, justify a more liberal interpretation of his motive: be this as it may, the service he did the state procured him the honour of knighthood, and the more solid respect of a pension of £100 per annum, a considerable sum in those days; and in respect to the city of London, whose chief officer so distinguished himself, it is said the dagger was added to their arms.

The destruction of stew-houses by Wat Tyler was not essential, for they were afterwards again permitted in the reign of Henry the Sixth; they were for some time shut up by Henry the Seventh; they were then eighteen, but they were shortly after again licensed and reduced to twelve; from this number no alteration took place till their final suppression by the public proclamation and sound of
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trumpet, in the year 1546, by his majesty king Henry the Eighth, a prince who, though he defied the authority of the Pope, and gave no very great example of reformation in his own person, yet by grace or caprice thought proper to destroy an establishment which must have been a less disgrace to his reign than most of the acts of his own life; thus tenderness of conscience for the welfare of others was no more conspicuous than his exemplary contempt for lewdness. But even in the days which tolerated these receptacles of profligacy they were maintained from policy alone, as appears by the conduct of the churchmen of those times; the inmates or single women were excommunicated, not suffered to enter the church while living, and refused Christian burial after death, and were interred in a piece of ground called the single woman's churchyard, set apart for the purpose. The houses were distinguished by several signs painted on the fronts, as a Boar's Head, the Crane, the Cardinal's Cap, the Swan, the Bell, the Castle, the Cross Keys, and the Gun; and though sanctioned by legal authority, yet in such a light of disrepute were the keepers of them held, that by an act passed in the eleventh year of the reign of Henry the Sixth, they were prohibited from serving or being impannelled upon any jury, or keeping any tavern or public house of entertainment. Long previous to this act, and after the death of Sir William Walworth, to whom, as before observed, the stews belonged, the whole profit of licensing the stews came into the hands of the bishop, but John Northampton, who succeeded Walworth, either piqued at the bishop's invading his right, or out of real reforming principle, commenced a severe persecution. He had his spies and constables in every street to apprehend strollers, and such women as were neither handsome nor rich enough to bribe his officers were carried through the streets in great pomp, with their hair shorn, and trumpets and pipes playing before them. This was contrary to the bishop's express commands, who had several bickerings with him on the occasion. That bishops who are covered with the sacred garb of religion, should in any age have so prostituted the very name of holiness, is a melancholy instance of human
depravity; and that any part of the revenue for the support of these holy fathers should be drained from such sinks of wretchedness, taints their character with a rank hypocrisy, unknown, we hope, to the prelates of our day. We have still errors for which some sober brow will furnish a text, but the days of superstitious reverence to the tricks of priestcraft are, we hope, gone for ever.

There is a very respectable treatise on syphilis lately brought out by John Bacot, Esq., late of the Foot Guards, who has most religiously followed in the wake of Astruc in support of its modern origin, although he admits: "that beyond a gonorrhoeal discharge, and ulcers or pustules on the parts of generation, no other evil consequences were to be dreaded from impure connexion." These are Mr. Bacot's words, and such are most of the arguments produced by those who have taken up the modern origin and contracted notions of syphilis.

"Quodcumque ostendis mihi sic, incredulus odi.
Opinionum commenta delet dies
Sed tempus confirmat Naturæ judicia."

Let us now examine the writings of Mr. William Beckett, who set a worthy example

"Of tracing Nature up to Nature's Fount,"

in two very able papers on the antiquity of the disease published in the 30th and 31st vol. of the Philos. Trans. of London, 1718. The chief authorities he adduces in support of his opinions are the following. The first is from John Arden, an Englishman, who lived at Newark in the year 1349, and afterwards removed to London.

Among other things relating to this subject, it would appear that he mentions a disease called arsura, which consisted of an internal heat, with an excoriation of the urethra; but this is only a repetition of what is to be found in the Arabian writers. Mr. Beckett's second argument is drawn from the ordinances of the Bishop of Winchester's stews in Southwark, where the disease of brenning, or burning, is recognised as the product of impure con-
nexion, and many regulations are detailed to prevent the spreading of the disease.

Another source of argument might also be derived from the statute published by Joan, Queen of the Two Sicilies and Countess of Provence, in the year 1347, the fourth article of which is to the following purport: the queen commands, that on each Saturday, "the bayless of the brothel, and a barber deputed by the consuls, do visit all the strumpets who shall be lodged in the brothel; and if any one be found who has contracted any disease by fornication, such woman shall be separated and lodged apart, in order to prevent the communication of disease to the young men."

So far Mr. Beckett successfully proves that gonorrhoea was a common disease long before the siege of Naples. He next proceeds to relate some cases, in which the leprosy was communicated by intercourse between the sexes,—a truth, the possibility of which no one could deny; but leprosy was well known in those days, acknowledged universally to be contagious, and, moreover, new symptoms are recorded, and no astonishment is expressed by the relators of these cases as to such an occurrence. Mr. Beckett next quotes Theodoric, originally a Franciscan friar, and afterwards Bishop of Cervia, who wrote in the twelfth century.

This author is remarkable on several accounts: first, as describing the same disease, the arsura, as arising from impure connexion with a leprous woman; and secondly, as having been the first who introduced the use of mercurial preparations into practice. The effect of mercurial inunction upon the mouth seems to have been well known to him; and this knowledge he plainly appears to have derived from the Arabians, among whom several formulae for the preparation of these remedies are to be met with; and which, as I before observed, they applied to the cure of many cutaneous diseases.

Theodoric is copied largely by our countrymen Gilbertus Anglicanus, and John of Gaddesden, the latter of whom recommends the following extraordinary mode of cure to the female patient, who is directed "to leap backwards down stairs." Such are the principal
facts adduced by Mr. Beckett in his first paper. Two years afterwards he published a second, in which he brings forward two additional testimonies in support of his former opinions. The one is a manuscript in Lincoln College, Oxford; wherein it is asserted, that Thomas Gascoigne, Doctor of Theology, the author of the manuscript, was acquainted with several persons who had died of the putrefaction of their genitals and of their whole body, in consequence of illicit connexion; adding, that John of Gaunt died of this same disease; although from the context it would appear plainly, that no particular disease was alluded to in this instance at least, but that the death of that prince was owing to "frequentationem mulierum, magnus enim fornicator fuit." The other testimony is that of John Arden, spoken of above, to which there is therefore no occasion to revert.

I might have extended these evidences in support of its antiquity by the most enlightened writers of France, Italy, Germany, and our own country; but I think I have adduced quite enough to prove,—

1st. That primary symptoms of the disease were not unknown to the ancients.

2d. And in the subsequent remarks, I will make it evident, that it did not originate with the crew of Columbus, nor at the siege of Naples.

The first authority on record who mentions this new disease, as it was then supposed to be, was Peter Martyr, who was physician to the King of Spain, and actually at Barcelona when Columbus first returned from the West Indies, at which place he remained some time; but there is not the slightest mention made of this disease in his account of the crew who returned in a sickly state: indeed it would have been very inconsistent if he had, for the said physician, Peter Martyr, had given a description of this malady at least five years before the siege of Naples or the return of Columbus, in a letter addressed to Arius Lusitanus, Professor of Greek at Salamanca. This letter is dated April 1488, and contains the following passage:—In peculiarem te nostræ tempestatis morbum, qui appellatio

\[\text{Beckett’s Oxford papers.}\]

\[\text{That it is ancient, and not modern.}\]

\[\text{Peter Martyr.}\]
corum Elephantiasin alii, alii aliter appellant,) incidisse precipitem, libero me scribes pede. Lugubri autem elego calamitatem ærum-nasque gemis tuas, articulorum impedimentum, internodiorum hebitudinem, junctorarum omnium dolores proclamas, ulcerum et oris fœditatem superaddis. Dr. Titley rejects this evidence, on the ground that Greek was not taught at Salamanca for several years afterwards, but this is no proof against the authenticity of the said document.

From the mass of conflicting testimonies on this subject, we find Fracastorius states it to have broke out in 1490; Fulgosi in 1492; Petronius, Torrella, Haschard, Ulrich, and Borgarutius place its occurrence in Italy in 1493. Vigo, Massa, Cataneus, Hock, and Fallopius place it in 1494.

Ant. Musa Brasavolus fixes it in 1495, and Montesaurus, Phrissius, Mainard, Benivenius, and Montanus refer it to 1496.

Now is it not a most extraordinary circumstance, that this extraordinary malady did not receive more faithful chroniclers? Is there any just grounds for its West Indian origin? Certainly not; and as for its Neapolitan origin, it rests on no better foundation.

Then, from whence had this disease its origin?

Mr. Bacot, after exculpating its West Indian source, very candidly calls it "a more difficult task— in fact, a Gordian knot, which, not being able to untie, I must endeavour to cut;" but he does not forget to tell us that other medical writers, as well as himself, were glad "to escape from this dilemma by the same short route."

No wonder that those writers cut the Gordian knot, since Mr. Bacot himself admits, if I mistake not, that he entered on the investigation of this subject with a mind prejudiced in favour of its modern origin, by hearing Mr. Pearson's lectures.

Now Astruc was the great champion who fought the battle and cut the Gordian knot for the modern hypothesis; a man of the most extensive erudition, of indefatigable industry, and the most consummate tactician, in making the most of every circumstance in support of his own opinions; but equally perverse and obdurate in
all things that did not accord with his modern theory of the disease; forming in himself the most striking parallel to a celebrated Old Bailey barrister, who defended the midnight assassin of ——— in a torrent of unprecedented eloquence, torturing the prosecutor’s witnesses with the most savage ferocity, while he had at the very same time the culprit’s confession in his pocket.

Amongst the multiplicity of causes assigned for giving origin to this disease, the Medical Astrologers of that age, with their Sidereal Influxes and Planetary Conjunctions, are equally entitled to as much credit as those who differed from them; and if the following extracts do not convey instruction, they may at least afford some amusement.

Thus, in the year 1497, Coradinus Gilinus, in his Treatise De Morbo Gallico, has asserted, that the origin of this disease was owing to—“Conjunctioni Saturni et Martis, quae fuit 16 Januarii, 1496, circa meridiem, quae significabat corporum humanorum mortalitates; aut conjunctioni Jovis et Martis, quae fuit 17 Novembris, 1494, in signo calido et humido, vapores a terrâ et aquâ elevando, quas Mars calidus et siccus inflammât et ignit, quibus postea aër immutatur et corruptur, humoresque corruptos et adustos generans harum ægritudinum causa est.”

So in the year 1500, Gaspar Torella, in his Treatise De Pudentagra, has maintained that this disease arose from—“A constellatione corporum superiorum, eo quod affectus universalis in causas universales resolvi debat; et hoc propter Saturnum existentem in Ariete; nam in Ariete et Piscibus sunt quaedam stellae habentes virtutes generandi monstra.”

So did Wendelinus, who refers the disease to the year 1483, because,—“Quo eo anno mense Octobris fuerunt quatuor planetae, videlicet, Jupiter, Mars, Sol, et Mercurius, in domo ægritudinis, et significat ægritudinem ex corruptione sanguinis et cholerae: et fuit ibi combustus Jupiter eo signo: fuitque ibidem conjunctio Jovis et Martis et Mercurii: et Martis et Veneris, Jovis et Mercurii, et Jovis et Veneris de mense Octobris die primâ Novembris. Fuit praeterea bis eclipsata Luna eo anno, tam in Scorpione in domo ægri-
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dinis, quam in ejus opposito. Fuit præterea in eodem Scorpione in ipsâ domo ægritudinis combustus Saturnus et Mercurius, conjunctus Saturnus et Venus, fuitque conjunctus Saturnus et Mars in ultimâ Novembris, et sic significaverunt corruptionem sanguinis et cholerae, et conjunctiones omnium humorum, et abundantiam humoris melancholici tam in viris, quam in mulieribus."

And lastly, Laurence Phrisius was of opinion,—"Sciendum L. Phrisius esse ad causæ morbi primitivae evidentiam, quod in anno Christi, 1483, fuerunt nonnullæ planetarum congressiones, die viz. 15 mensis Octobris hora secunda post meridiem. Ut autem clarius intelligas, scito tempore Jovem, Martem, Solem, et Mercurium simul coisse in Librâ, in octavâ domo quæ ægritudinis et significativa. Fuit quoque humanæ naturæ amicus Jupiter combustus."

Now these reveries of the astrologers are too contemptible to require one moment's consideration, as all naturalists are of one accord, that the planets have no influence over our bodies, so as to affect the animal economy in any way whatever; but if I might venture to offer my humble opinion here, they would have made a nearer approach to the true cause of this disease, had they assigned the conjunctions of Rem in Re instead of Mars and Venus; the siege of Mons Veneris, not of Naples.

After the Astrologers come the Divines, who at once ascribe the visitation of this disease to the just retribution of an offended Deity, for the violation of his laws, and to restrain the sensual gratifications of our unruly passions, or as a scourge to correct them, as Cicero has it in his Tuscul. Quest. l. 4. Neque sine magna utilitate constitutum esse videtur, ut homines castigationibus affici se in delictis dolerent.

May we not conclude from this sublime sentence of the Roman legislator, and those divine institutions of the Jewish legislator, that mankind have been the same in all ages and in all countries, modified in some degree by climate, mode of living, &c., with similar passions, similar desires, and similar diseases, all arising
from natural and immutable laws, which, however they may be thwarted,

"Naturam expellas furca, tamen usque recurret,
Et mala perrumpet furtim fastidia victrix." Hor.

You may oppose Nature by violence, yet she will assuredly return and be avenged on you for the infraction of her laws.

Among many other fabulous stories concerning the origin of this disease, Leonicenus and others ascribed it to a rainy season. Maynard of Ferrara, said it was disseminated by a leprous knight having intercourse with a common prostitute.

Even Fallopius promulgated an opinion, that the Spanish soldiers poisoned the wells and bribed the Italian bakers to mix lime with the flour intended for bread.

Andrew Cæsalpinus, of Aretum, physician to Pope Clement VIII., in his Book Artis Medicæ, lib. 4, cap. 3, makes a boast of being able to tell a better story of its origin; and what was this, but that the Spaniards tainted the wine with blood drawn from the patients in the lazarettos, or hospital of St. Lazarus. But to enumerate one half of the idle tales recording the origin of this disease would be futile and vexatious. I will now advert to a series of periods, at which this disease broke out with remarkable violence.

1st. At the siege of Naples, in the year 1494, when the troops of three different nations commingled pell-mell together, this disease assumed an aggravated form, no doubt from a very natural cause or causes, which gradually became milder, during the space of twenty years, when it had nearly ceased.

2d Period commenced in 1516, and lasted about ten years. The disease now was more correctly described, with the addition of two new symptoms noticed—exostosis and warts.

3d Period was noticed in the year 1526 to 1540, during which time buboes and alopecia were first noticed.

4th Period is noticed from the year 1540 to 1550, and was
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remarkable for the disappearance of some of the former symptoms, such as the Gunmata; but in addition there was virulent Gonor-rhoea.

5th Period was from 1560 to 1610, during which time Tinnitus Aurium was added to the former catalogue of human misery.

6th Period from 1610, brings us acquainted with another feature of this disease, termed the Chrystalines, which is nothing but a clear serous effusion into the cellular tissue of the prepuce, producing phymosis or paraphymosis.

In addition to those periodical observations of Fallopius, there is one not less remarkable than any of the above, which happened in the 12th century, when the troops of all nations, in their holy zeal, congregated under the banners of the cross to fight the infidels with such persuasive weapons as fire and sword. Need we be surprised at the result, when the few that returned were dreadfully afflicted by a disease in all respects similar to that which broke out at the siege of Naples.

We come now a little nearer our own times, when we can view such events with a clearer light, and examine them without prejudice or planetary influence. The circumstance I allude to will be found in Baron Larrey's report of the state of the French army in Berlin after the battle of Jena, wherein he says, "that the most destructive malady they had to contend with, was the venereal disease, which affected a vast number of the troops, and presented the most rebellious character."

The next and last circumstance that we have recorded of this kind, will be found in the introduction to a very excellent treatise on syphilis by Herbert Mayo, F.R.S., Senior Surgeon of the Middlesex Hospital, quoted from Dr. Ferguson's paper in the Med. Chir. Trans., who served in the Peninsular war, thus:

"In the British army, in 1812, more men have been mutilated by primary venereal sores, during the four years that it has been in Portugal, than the registers of all the hospitals in England could produce for the last century; while venereal ulceration has not only been more unyielding to the operation of mercury, than

Holy war.

Baron Larrey, after the battle of Jena, in 1812.

Dr. Ferguson's account from Portugal, in 1812.
under similar circumstances at home, but the constitution, while fully under the influence of the remedy, has become affected with the secondary symptoms in a proportion that could not be expected.” Dr. Ferguson attributed the destructive effects of the venereal virus, when transmitted from the natives of Portugal to the British soldiers, partly to its being in some measure new—a branch of the virus which had become modified by passing for several centuries through a stock of different habits, constitutions, climate;—and partly to the state of health of the parties who received the infection.”

It is not less remarkable in this report of Dr. Ferguson, that the Portuguese, who communicated the disease to our men in this malignant form, experienced it themselves in the mildest degree, for which they never take mercury. Dr. Ferguson gives the following case.

“A British officer applied to me four days after having connexion with an opera dancer at Lisbon, with the whole penis enormously swelled, of a deep red colour; there were chancres on different parts of the prepuce, and two on the glans penis, the appearance of which could be compared to nothing but the holes made in a piece of mahogany or log-wood.

“The person who communicated the infection continued on the stage for many months afterwards, apparently in perfect health, but occasionally infecting others in a similar manner.”

From what has been already advanced on the antiquity of this disease, and the various periodical exacerbations it has developed, may we not reasonably conclude, that the disease has existed from the earliest period of society, when the indiscriminate intercourse of the sexes prevailed; and that the aggravated form it assumed after the siege of Naples, the battle of Jena, and with our own troops in Spain and Portugal, are all in perfect accordance with pathological principles, which we may see verified by examining the venereal wards of the various metropolitan hospitals? For instance, the London Hospital, in Mile End, is favourably situated, by its proximity to the docks, for the reception of virulent gonorrhoea,
VENEREAL DISEASE.

sloughing chancrest, &c. The Borough hospitals shall present also virulent gonorrhoea, sloughing chancrest, and phagedenic bubo, &c. Should you be inquisitive about the topography of those cases, you will in all probability find the London Hospital supplied from the Jews' brothels in Ratcliffe Highway, frequented by sailors, lascars, and foreigners; and according to Mr. Travers, Swan Alley, Tooley Street, is quite sufficient in itself to supply St. Thomas's Hospital with cases of the worst description.

Now go to the west end hospitals, St. George's, the Middlesex, the North London. Will you find phagedenic, sloughing, venereal ulcers there? certainly, but in a relative proportion of one to fifty.

Now what is the cause of the same disease presenting a series of symptoms comparatively mild in the west end hospitals, while those of the east end have such a disproportion of worse cases? I should say from a combination of at least two causes; first, the more filthy habits of the prostitutes at the east end, and the indiscriminate intermixture of foreign sailors, &c. Why then should we be surprised at the virulence of this disease at the siege of Naples, or why should we derive its origin from the West Indies, opposed as it is by such unphilosophical and flimsy evidence as Astruc, in his party zeal, brings in support of his notions? Nay, the most positive proofs that could be produced of its antiquity among the Chinese would not convince him, as the following extract from his own work will show.

"John Astruc was born in France, studied medicine at Montpellier, at which place he became one of the professors. In 1729 he was chosen physician to the King of Poland, but did not remain long; he returned to Paris and was made consulting physician to the King, and Professor of Medicine to the Faculty, where he attained deservedly great celebrity. By his official appointment he had great facilities of communicating with foreign nations, and in his ardour to furnish additional evidence to support his opinions, (evidently dissatisfied with what he had already pro-
duced as insufficient,) he constructed a series of interrogatories, in the year 1737, to be sent to a Jesuit priest at Pekin, the capital of the Chinese empire, concerning the existence of this disease, its antiquity, the name by which it was known, the mode of treatment, and a minute description of the primary and secondary symptoms, &c.—These queries formed eleven distinct propositions, and in the year 1739 he received the answers to each query from the said Jesuit priest, which he had obtained from the principal native physicians resident there.

The first question proposed was—"Are the venereal pox, and other diseases of that kind, frequent amongst the Chinese?"

Answer.—"Yes, venereal diseases are frequent in the empire of China, the same as in Europe."

Question 2d.—"By what name do they designate this disease; and whether that name be deduced from the Chinese language itself, or derived from any other foreign tongue, or nation?"

Answer.—"By many and various names; such as, 1. Yang-Mei-Tchouang, which signifies a fruit wound or an ulcer in general. 2. Tien-Pao-Tchouang: signifies an air-bubble-ulcer, or bubble of Heaven, which is a punishment from avenging Heaven. 3. Mien-Hoa-Tchouang, or the cotton ulcer, because when the disease becomes inveterate it sticks to one like the fine down of cotton*. 4. Kouang-Tong-Tchouang, the Canton-ulcer, from its being communicated from Canton to the other parts of the Chinese empire, but at what time is unknown. 5. Chi-Tchouang—the ulcer of time, because it has existed here in all ages, and attacks at all times and seasons, either winter or summer. All these names are derived by analogy from the Chinese language itself; nor have they any other name from a different source."

Question 3d.—"Are these diseases recognized by the Chinese physicians to have been generated in China, and known there in all ages, or are they new, and imported from some other country?"

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* The Glue is a well-known term for it in London.
Ans.—"The Chinese physicians are of opinion, that the venereal disease has been known in the empire of China in all ages: and indeed the medical codices, written in the Chinese language, are acknowledged to be very old, and are quite silent as to the first appearance of that disease, nay, it is mentioned in them as being very ancient at the time when those books were written. Therefore, it is neither known to have been imported from any other country, nor is it probable. Certainly it can by no means be inferred from the names which it goes by in China, and which we have treated of in the first answer."

Quest.—"What remedies do they employ in China for the cure of this disease?"

Ans.—"For curing the venereal disease they generally employ not only plants, which naturally grow in the country, but also quicksilver."

These are the principal questions and their answers, which Astruc himself has given as he received them from China, and which we might reasonably conclude would have been amply sufficient to have convinced him of the existence of the venereal disease from the most remote ages of society. But was he not convinced? No, as you shall presently see by his own Jesuitical twisting comments on those answers.

"Observations upon the Theory of the Venereal Disease amongst the Chinese.

"1. That the Chinese unanimously assert that the venereal disease, and those complaints which arise from it, have been known in all ages in China. But many reasons concur, to convince me that they are deceived. 1. The venereal disease is called by so many, and such various names by the Chinese. Now what occasion is there for so many names for one and the same disease, unless there was no certain appellation fixed for it well known? Therefore, it is certain that a general name would have been given to it, if it had been known from all ages in the Chinese empire, as it is in other countries."—Astruc, p. 295.
Is it possible to conceive any thing so frivolous, so perversely absurd? He sent a special commission to inquire whether the venereal disease existed in China, and they assert unequivocally in the affirmative. But he does not believe them, for he tells them with unblushing effrontery, that they are deceived, and how does he prove this? Oh! they have so many names for it, "consequently it must be new amongst them." Again he observes, "That the Chinese deny that the venereal disease was imported to them from any other country, and will have it endemic and originally produced in the Chinese empire, which they (foolishly) think is proved by those very names of the disease. But I am persuaded that those names prove it to be derived from the southern provinces, from its resemblance to a certain fruit produced there called Yang mei Tchouang, the fruit ulcer, as the Jesuit interprets it: and if I might be allowed to stretch my conjectures a little farther, (how modest!) I durst venture to affirm, not only that the venereal disease was new in the Chinese empire; but also, that it was brought there by the Portuguese in the year 1517." This is too contemptible to waste arguments in refutation of it.

The next comment he makes, is a specimen of his etymological talents upon a word in a language of which he admits he knows nothing; thus, "That amongst the Chinese names of the venereal disease, there is one occurs which seems evidently enough to show the novelty of it; viz. Chi-Tchouang, (see Ans. 2. No. 5,) that is the ulcer of time. In vain does the Chinese interpreter allege that the venereal disease is so called, because it had existed time out of mind in the Chinese empire; or because it attacks at all seasons of the year. These are mere comments of the Rev. Father Perennin, invented on purpose to give the origin of an unknown word. But if I might be allowed to offer a conjecture concerning a word in a language of which I am perfectly ignorant, I should say, that Chi-Tchouang, the ulcer of time, meant the ulcer of the present time, as we might say by the same idiotism, the disease of the time." p. 296.

Admirable commentator! Only think of his consummate har-
Astruc accuses
the Jesuit of
misinterpreta-
tion.

Reflections on
Astruc's evi-
dence.

diesse in accusing Father Perennin of misinterpretation, who resided thirty years in China, and had those medical terms explained to him by the Chinese physicians, in order that he might not commit a technical error; but because it tended to prove the antiquity of the disease, a fig for Father Perennin's comment, "'tis a mere invention, I will give the derivation of the word, although I am perfectly ignorant of the language."

Now I could not offer my reader such a gross insult to his powers of ratiocination as a comment on the foregoing extract, as it carries "the bane and antidote" with it: but "quodcunque ostendis mihi sic, incredulus odi." It would be easier "esuri-ente Leone ex ore exculpere prædam," than to force a conviction on him. Contrast this infidelity on the Jesuit at Pekin, with the story told him by the Jesuit Benedict Victorius of Florence, who says, "That he knew some very honest and strictly religious nuns, who were guarded in the closest manner, unfortunately contract the venereal disease from a peculiar state of the air." Now Astruc could believe in the immaculate virginity of those very honest, religious, and strictly guarded nuns, labouring under the venereal disease; "and also the story of the Surrentine nuns, who caught the disease by kissing a child who was suckled by a foul nurse," because it comported with his theory, while he rejected the unanimous opinion of a whole nation who happened to dissent from him.

I must now close my account with Astruc, with some observations on the first paragraph in his book.

He there says, "'tis our duty to shew an awful respect and submission to the judgments of God, when they are plain and evident." To the first member of this sentence I have no objection, but "when they are plain and evident" he would appear to throw dust in our eyes, by mystifying the "judgments of God," which are always so evident, that he who runs may read. In continuation, he adds, "but to be too inquisitive in searching into his secret decrees, or, which is worse, to attempt to confine the providence of God within the narrow limits of our own reason, or measure his
infinite wisdom by the rules of human understanding, *is impious* and profane." By a similar anathema poor Galileo was sent to a dungeon in his old age, by an infamous Jesuitical inquisition, for "*searching into his secret decrees.*"

"Nature and Nature's laws lay hid in night—
God said 'Let Newton be,' and all was light."

Newton would have shared the same fate for being "*too inquisitive;*" and Franklin would have been reduced to a cinder, "*quia eripuit ceelo fulmen.*"

Is not man Nature's high priest, and sole interpreter of her secrets; nor does she forbid him the office, although she prefers "*to do her business in the dark,*" in narrow by-alleys and unfrequented paths: true she is coy, and somewhat prudish, and very right too; she is not to be taken by assault and battery. She never lavishes her gifts on those who are indifferent to her charms, therefore the only condition by which her favours are to be obtained is—that you shall admire, adore, become her ardent lover, nay, her devoted slave. But the man who would so arrogantly presume to limit our "*researches into Nature's decrees,*" only merits our contempt, or recrimination, by hurling back such an impudent injunction on him from whence it came, as the more "*impious and profane.*"

Away with such mawkish tight-laced philosophy. Hear what Bacon says, "*Homo, Naturæ minister et interpres, tantum facit et intelliget quantum de Naturæ ordine re vel mente observaverit: nec amplius scit, aut potest.*"—Nov. Org. Astruc could believe in the purity of nuns labouring under the venereal disease, and in stellar influence. He could search heaven and earth, east and west, for materials to bolster up his modern theory, which is now fast giving way,

"*And like the baseless fabric of a vision
Leave not a wreck behind.*"

I will now close with Astruc, but not in wrath, for I scorn to "*kick the dead lion.*" His work on the venereal disease, consider-
ing the time in which he lived, is, in a practical point of view, beyond my praise or blame; I only dissent from him on its *origin* for the following reasons.

1. Because we have very strong presumptive evidence of its existence amongst the ancients.

2. Because it has been proved that it did not originate with the crew of Columbus, nor at the siege of Naples.

3. Because, if the human species are the same now as they were four thousand years ago, the same results would arise then as it does now, from the indiscriminate intercourse of the sexes.

4. It is unphilosophical, because it tends to limit our researches, which ought to extend to every available source.

5. It is unphysiological, because it is in opposition to those laws which regulate the human vital functions.

6. It is unpathological, because it is inconsistent with those phenomena usually attendant on this disease.
LECTURE I.

THE VENEREAL DISEASE.

The subject of this evening’s Lecture will be the Venereal Disease.

There are two poisons communicated by venereal intercourse: one the poison of gonorrhoea, which, falling upon a mucous surface, produces from that surface a discharge of matter which is infectious; the other, the poison of syphilis, which, when applied to the surface of the skin, or as far as is known at present to any surface, produces inflammation and ulceration, forming a primary sore which is called chancre; which, being received into the absorbent glands, occasions bubo, and which being conveyed into the circulation, produces inflammation and ulceration in the throat, on the skin, the periosteum, and the bones.

When gonorrhoeal matter is applied to the urethra, the following symptoms generally arise in three or four days after its application: the patient first experiences a sense of titillation in the urethra, as if a drop of urine were contained in it. This directs his attention to the part, and he finds that the lips of the urethra are red, and that there is a slight mucous discharge.

The next circumstances which take place are these: the urethra begins to be affected with considerable heat, and he experiences pain in discharging his urine; this state is called ardor urinae. The pain increases till it becomes in many cases excessively severe; there is an appearance of threads mixed with the urine, which arises from the adhesive inflammation in the lacunæ of the urethra.

The next effect is a considerable diminution in the stream, the swollen state of the urethra contracting the size of the canal. The urine is often discharged in two, three, or more streams, in
The discharge muco-purulent.

Becomes chronic.

Phymosis.

Inguinal glands affected.

consequence of the contracted and irregular state of the urethra. At first the discharge from the urethra is mucous, but after a little time it assumes a purulent appearance. The matter becomes yellow, and if the inflammation be very considerable, green; and it is often intermixed with blood, so as to give a sanious appearance to the discharge. You are enabled, therefore, from the colour and appearance of the matter, to judge of the degree of inflammation in the urethra.

These are the circumstances which occur with respect to the appearance of the matter. I should observe to you, that although the appearance of this fluid is purulent, it has not really the character of common pus. If you examine the discharge by the aid of a magnifying power, you will find that, though there may be some few globules of pus, the greater part of the discharge is mucous. The time this matter will continue to discharge is quite indefinite. It is said that gonorrhœa will wear itself out, but it will sooner wear out the patience of the patient. I have known it continue for months, and I shall have occasion to mention a case in which it continued to be infectious during all that time.

It sometimes continues for so long a time, notwithstanding all the means which may be employed for its cure, as to be an opprobrium to our art. In no case, however, ought you to rely on the efforts of nature for its cure, for in general you may very much expedite the cure by adopting a judicious method of treatment. Besides these external effects on the urethra, gonorrhœa takes also an internal course. It does not confine itself in its external effects to the beginning of the urethra, but often produces an erysipelatous inflammation of the glands and fraenum, occasioning effusion into the prepuce and phymosis. The absorbent vessels on the dorsum penis often become enlarged and hard, and produce little abscesses, which go on to suppuration. The glands of the groin are sympathetically affected, and in a first gonorrhœa seldom fail to become enlarged and painful. Where this effect takes place from gonorrhœa, several glands of the groin are affected at the same time, whereas in the absorption of the poison of syphilis a
single gland only is enlarged on each side. Abscesses are very rarely occasioned by a sympathetic enlargement of the glands of the groin from gonorrhoea; they may almost always be prevented by proper attention on the part of the surgeon. When I say the glands of the groin are sympathetically affected, I am aware that this is not a strictly proper term for this species of irritation, because the swelling undoubtedly arises in consequence of the gonorrhoeal inflammation running along the course of the absorbent glands; it is a continuation of the inflammation along the course of the absorbent vessels.

With respect to the internal course of gonorrhoea, the effusion in the urethra often proceeds further than the original seat of the inflammation. Swelling and suppuration often take place in the mouths of the lacunæ; matter is very commonly accumulated in the lacunæ, and especially in the lacuna magna, which may be known by a swelling and fluctuation on the sides of the frænum. Irritation and inflammation also take place in the corpora spongiosæ, producing that painful state of the parts termed chordée, in which the penis feels as if it were bound down, so as to prevent a complete extension. The penis is sometimes curved and sometimes turned considerably to one side. The next effect of gonorrhoea is the production of stricture, which is generally seated near the bulb of the urethra, and arises from the diminished diameter of the canal, in consequence of the thickening of the part from inflammation; another effect is an inflammatory state of the muscles of the perineum, accompanied with great irritation and violent spasmodic contractions.

The inflammation sometimes extends itself to the spot where the vasa deferentia open at the veru-montanum*, producing a swelling which was absurdly called hernia humoralis. When it extends to the prostatic part of the urethra, there is great irritation at the neck of the bladder; the patient is often under the necessity of pressing on the perineum when he makes water, and soon after inflammation.

* Veru-montanum is a small oblong eminence situated within the prostate, at the under part of the urethra.
The effect on old men.

The effect on old men. Whenever an old man gets a gonorrhoea it is generally accompanied with an enlarged state of the prostate gland, and he rarely escapes without experiencing the most excruciating suffering from this cause. It rarely happens that an old man gets this disease without having bitter reason to repent of his folly. The bladder becomes affected, in consequence of the gonorrhoeal inflammation, it becomes highly irritable, and the patient experiences a constant inclination to make water. Thus gonorrhoea produces various effects, not only in its external, but in its internal course, such as abscesses in the lacunæ, stricture, inflammation of the prostate gland, and irritability of the bladder. It is not so simple a disease, therefore, as you might at first be disposed to imagine.

There is no comparison as to the difficulty of getting rid of syphilis and gonorrhoea; syphilis is a disease which a child may generally cure; gonorrhoea is a disease which very often baffles the longest experience, and the greatest professional skill. Having described to you the symptoms of gonorrhoea, I shall make a few general observations on the disease, before I proceed to speak of the treatment of it.

In the first place, what is the time in which it appears after connexion? The usual limit is from four to seven days; it is seldom under four, and very rarely exceeds seven days. I have known it, however, occur within twenty-four hours after connexion, and sometimes a fortnight, or a longer time will elapse before it appears. I have known an instance in which it was delayed for fourteen weeks, in consequence, I believe, of the general indisposition of the patient. The cause of gonorrhoea is undoubtedly inflammation of the lacunæ of the urethrae, and particularly the lacuna magna. You will have an opportunity of seeing the state of the lacunæ under this inflammation, in the injected urethra *, in two different preparations. The inflammation is of the erysipelatous kind, but there is no appearance of ulceration. If ulceration were produced, the membrane of the urethra would

* In St. Thomas's Hospital.
soon give way. It is merely a secretion from the mouths of the vessels; ulceration does occasionally take place in the lacunæ, but not in the urethra itself. When the inflammation runs high, it extends down to the bulb of the urethra. Many years ago, I had an opportunity of examining the urethra of a man who was executed, and who had gonorrhœa at the time of his execution. The inflammation had extended down to the bulb of the urethra; for an inch or an inch and a half down the urethra was exceeding red, and there was some effusion of matter on the internal surface; the urethra was red at the bulb, but not of so deep a colour. The inflammation, therefore, is not confined to an inch or an inch and a half down the urethra, but often extends over the bulb of the urethra, and in this way produces strictures. In the case to which I allude, the gonorrhœal inflammation had extended at least seven inches down the urethra. In general, on examination of a subject who has died under gonorrhœa, you will find a small quantity of purulent matter at the extremity of the penis, and inflammation extending about an inch and a half down the urethra, which, if exposed to the air for twenty-four hours, assumes a florid redness. With respect to the manner in which this disease is contracted, I have heard some very curious and laughable disquisitions on this subject, by persons who prefer entering into such speculations, to making observations for themselves. There can be no doubt that the disease is produced by the direct application of the poison to the lips of the urethra, for you will find that the first symptom which takes place is a pouring state of the lips of the urethra, arising from inflammation. The lips are first attacked, and the inflammation gradually extends itself to the internal surface of the urethra; the disease begins from without, and extends itself to the internal surface. So much for the manner in which the poison is received.

We find that the discharge from gonorrhœa is very much affected by constitutional causes. A man shall have an abundant discharge from the urethra, considerable pain, and even chordæe, and if he should get a fever, the discharge disappears, the pain ceases, and he will be entirely free from all symptoms of the disease for a period.
Discharge suspended by fever.

of from seventeen to twenty days. As soon, however, as he begins to recover from his fever, the discharge of matter will be resumed, the pain and chordee will return, and a long time may elapse before the disease can be removed. These constitutional causes suspend the action of gonorrhœa, but the symptoms will return as soon as the constitutional irritation ceases. You will generally find the cure of gonorrhœa difficult, in proportion as the constitution of the patient is disposed to strumous affections. If a patient has pimples in his face, enlargement of the glands of the neck, a thin, delicate skin, and irritable fibre, you may expect to have great difficulty in curing him of gonorrhœa.

The treatment of gonorrhœa is founded on two principles; the disease may be either treated simply by diminishing inflammation, or it may be treated by producing a change in the action of the part, by which the disease is removed in a short period. These are the two principles on which surgeons act in the treatment of gonorrhœa. In the first place, gentlemen, let me observe to you, that no greater folly, and indeed cruelty, can be committed, than that of giving mercury to patients for the cure of this disease. A man who gives mercury in gonorrhœa really deserves to be flogged out of his profession, because he must be quite ignorant of the principles on which this disease is to be cured. To give mercury to a young and irritable person, who is probably constantly exposed to vicissitudes of temperature, for a disease which does not require it, thus exposing the health and even the life of the patient to danger, is, in the present state of our knowledge, perfectly unpardonable. It is lamentable to reflect on the number of lives which must have been destroyed by phthisis and otherwise, in consequence of the imprudent exhibition of mercury for a disease which did not require it, which prevailed among the older surgeons. At the present time, however, a surgeon must be either grossly ignorant, or shamefully negligent of the duty which he owes to the character of his profession, and to the common dictates of humanity, if he persists in giving mercury for this disease. Let those persons who suppose that gonorrhœa can be cured by mercury, go round our wards.
and see whether mercury has any effect on that disease. Look, gentlemen, at one hundred patients in our foul wards, many of whom come into the hospital with syphilis and gonorrhoea, and many, I am sorry to say, who have only gonorrhoea, but who are invariably carried to these wards. What is the miserable treatment of these patients? You are aware, gentlemen, that I scarcely ever enter the foul wards of the other hospital;—when a particular case demands my attention, I have the patient removed to a clean ward. I will tell you why I do not enter these wards, gentlemen. I abstain from entering them, because patients under gonorrhoea are compelled to undergo so infamous a system of treatment, that I cannot bear to witness it. To compel an unfortunate patient to undergo a course of mercury, for a disease which does not require it, is a proceeding which reflects disgrace and dishonour on the character of a medical institution. No consideration shall induce me to repress my feelings on this subject—no authority shall restrain me from giving full expression to those feelings. As long as I continue a surgeon of Guy's Hospital, I will endeavour to do my duty; but I care not whether I continue a surgeon of that Hospital another day. I do say, that the present treatment of patients under gonorrhoea in these Hospitals, by putting them unnecessarily under a course of mercury for five or six weeks, is infamous and disgraceful. The health of a patient is perhaps irremediably destroyed by this treatment, and after all, not the slightest effect is produced by it on the disease. If he be cured of his gonorrhoea at all, he must be cured by other means. If you go to a patient for gonorrhoea in the foul wards, at the end of his course, and ask him how many times he has rubbed in, he will generally answer, "twenty-eight times." If you ask whether he is salivated, he will tell you that he spits three pints a day; but ask him whether his gonorrhoea is cured, and he will reply "No, I have my clap still upon me." His disease is not in the slightest degree affected by the mercurial course to which he has been so unpardonably subjected, and it will soon after be necessary to cure him by injections or other
means. When so infamous a practice prevails, I cannot satisfy my own feelings by resorting to milk and water language; every man of common feeling and honesty, is bound to speak out on such an occasion. It is wholly unnecessary to give mercury in any form for this disease. When a patient applies to you for a first clap, it seldom happens that he can be cured by the same means which may be successfully employed in subsequent claps. The first clap is generally much more difficult to cure than those which subsequently occur. I shall proceed to state to you, the result of the experience which I have had in the cure of this disease for thirty-three or thirty-four years.

If I have not yet learnt the best mode of treating it, I have no hope that I can know any thing more on the subject.—I will state to you the plan which I have found to answer better than any other, without meaning, however, to say that this plan is better than those which may have been adopted by others. When the patient applies to you for his first clap, there will be generally a great deal of inflammation, and I advise you to give the sulphate of magnesia with the infusion of senna. An ounce of the sulphate of magnesia may be mixed with six ounces of the infusion of senna, and three table-spoonfuls given two or three times a-day, so as to purge the patient very actively. You may afterwards give the submurias hydrargyri with extract of colocynth, but merely as a purge, for if it were to act as a mercurial, I would not give it at all. There is no necessity for giving calomel, unless you wish it to act on the liver, as well as on the intestinal canal. Having purged the patient very freely, you will direct him to take diluting drinks, of which he can hardly take too much. Two drachms of the carbonate of potash, or the subcarbonate of soda, should be taken in a quart of some diluting drink in the course of a day: capillaire, or tea, will answer this purpose very well; some advise the gum of acacia, but whether it does any good or not I do not know. I have found the liquor calcis a very excellent diluent in this disease. Soda water is often useful, but it must be ascertained whether it produces irritability of the bladder; for in some per-
sons it increases instead of diminishing irritability. If it increase very much the inclination to make water, it should not be persisted in; if not, it will be a very excellent diluent.

The penis should be suffered to hang for a considerable time in warm water, which will relieve the inflammation, and produce nearly all the good of a warm bath. When the ardor urinæ and pain from chordee is very severe, twenty drops of the liquor potassæ, with from three to five grains of the extraction of conium, in the mistura camphorata, may be given with considerable advantage.

This is the plan which you should pursue during the first week. You may then apply lint dipped in the liquor plumbi subacetatis, to the part. Do not use an injection in the first instance, but pursue the plan I have pointed out to you during the first ten days. At the end of this time, when the inflammation has in a great degree subsided, you may begin by giving the patient the balsamum copaibae. An ounce of the balsam may be mixed with an ounce of the mucilage of acacia and four ounces of the mistura camphorata, and a table spoonful given morning and evening. Having given this mixture for two days, the discharge will be very considerably diminished, and you may then order an injection of the liquor plumbi subacetatis dilutus. This is the mode, gentlemen, in which gonorrhoea, as far as I know, is to be cured in the safest and most expeditious manner. In the third week I continue to give the balsamum copaibæ: and the best injection which can then be employed is the liquor plumbi subacetatis dilutus, with the sulphate of zinc.

R: Sulphatis Zinci, gr. vi.

By this plan you will generally succeed in curing a gonorrhoea safely and expeditiously. If, instead of using an injection, you suffer the discharge to run on, week after week, you will be almost sure to lay the foundation of stricture.

If a patient apply to you for a second or third clap, you will not proceed in this way, but give him the balsam of copaiva immediately, which will in general put a speedy stop to the discharge. The inflammation of a second clap is comparatively slight, and in
general it will only be necessary to give the balsam copaibæ for a
week, and then begin with the injection of the liquor plumbi suba-
cetatis dilutus, and the sulphate of zinc. In a first clap it is better
to begin with the liquor plumbi subacetatis dilutus in the first
instance, because this is less irritating, and afterwards to use it in
combination with the sulphate of zinc. The treatment which is
necessary to subdue inflammation in a first clap is in general en-
tirely unnecessary in subsequent claps.

Various other injections are employed in the treatment of gonor-
rhoea; half a grain of the sulphate of copper in an ounce of rose
water is a powerful injection; a solution of the oxymuriate of mercury
makes a very irritating injection, if of any strength, and should not
be resorted to in the first instance; it is used in the proportion of one
grain to twelve ounces of distilled water. You should feel your way
in the use of irritating injections; if they produce much inflamma-
tion, you should suspend the use of them; and if, on the other hand,
they excite no pain at all, you may gradually increase their strength.
Do not continue the use of the same injection, if it does not
answer the purpose very quickly; for you will otherwise be only
laying the foundation of stricture. It is much better to vary
your injection, than to persist in the use of the same injection, if
it does not very speedily put a stop to the discharge. It will
often happen that a patient will continue for a length of time under
the hands of his surgeon without getting rid of the discharge.

If a patient should come to you under these circumstances, what
I recommend to you to do is to begin immediately the use of
bougies with injections. The use of bougies will increase the
discharge for a time; but being combined afterwards with the
use of an injection of the sulphate of zinc, will generally succeed
in effecting a cure. With respect to the number of times the
patient should inject, three or four times a day will be quite suffi-
cient. As to the strength of the injection, it should be increased
so as to produce a slight degree of irritation; but it is better to
vary the injection, than to increase its strength in any great degree.

There are other means of curing gonorrhoea, by producing a
change in the action of the urethra, as, for instance, by the use of
cubebs. I remember the time when this remedy was much ridiculed, but there is now no surgeon of the least experience who does not acknowledge that it is a very powerful remedy in this disease. The value of this remedy may be known by applying to any merchant with respect to it. A short time ago it was introduced into this country in very small quantities; but now, such is its acknowledged efficacy, that whole ship-loads of it are annually brought into the port of London. I do not say that it would be advisable to employ this remedy at once for a first gonorrhoea, where the symptoms of inflammation run very high in a young and irritable person; it is better not to begin with the use of it until a week or ten days have elapsed, and the inflammation is considerably reduced.

I will tell you how I first learnt the value of this remedy: a gentleman from Java, who had lived for some time in Batavia, entered my room, and unbuttoning his clothes, immediately shewed me the part about which his mind was uneasy, and asked me whether I thought a sore upon it was venereal. I said certainly not. He said he was glad to hear it, for if it had been a chancre, he should have supposed that it had been produced by his curing a gonorrhoea very suddenly. He was running away very hastily, when I requested him to tell me how he had cured his gonorrhoea so suddenly. Why, he said, by cubebs. Cubebs, said I, what is that? for I had really at that time never heard of such a thing. Why, said he, it is a species of Java pepper, and if you like I will send you a bottle of it. I said I should be obliged to him; he accordingly sent me a small bottle of it, which I put into my desk, where it remained, without my thinking any thing more of the circumstance. Two or three months after, he came to me again, and said that as he had a severe gonorrhoea, he should be obliged to me, if I had any of the cubebs left, to let him have a little of it. This was on Thursday; I gave him the bottle, and after examining the state of his gonorrhoea, which was very severe, I requested him to let me see him on the following Monday. He came to me on that day, and the discharge was quite gone. This
excited my attention, and I began to think that it must be a medicine of great power. Very soon after, a gentleman came to me, and said that as he was going to give a very large dinner party, and should be obliged to drink a great deal of wine, he wished to be cured of a clap immediately. I told him I could not promise to do any such thing, but if he liked, I would give him a remedy, which a gentleman from Java had used with great success, and I then related to him the circumstance which I have just mentioned. The gentleman said he would try it, and he should prefer it to the balsam of copaiba; of which the people in his house knew the smell. He began taking two drachms three times a day on a Tuesday, and on Wednesday week after, the discharge not having entirely disappeared, he called on me to know whether he might take wine the next day, when he was to give his dinner-party. I told him I saw no objection to it, and the effect of the wine he drank on that day, added to the cubebs, completed his cure, for the discharge did not return afterwards.

Cubebs appears to produce a specific inflammation of its own on the urethra, which has the effect of superseding the gonorrhœal inflammation. They who have tried cubebs, and do not acknowledge its value, as a remedy for gonorrhœa, cannot have made any accurate observations on the subject. It is a remedy of a most admirable and useful kind, and may be given with advantage even in the inflammatory stages of gonorrhœa, provided the inflammation does not run excessively high. It is a most useful remedy also for the cure of gleet, as it is called, where gonorrhœa has continued for a great length of time. In the very early stages of gonorrhœa, when the inflammation is just beginning, it often succeeds in removing the disease in a very short space of time. I have one more observation to make with respect to this remedy, namely, that the greatest advantage may be derived from combining its use with that of the balsam of copaiba. An ounce of the balsam of copaiba, an ounce of the mucilage of acacia, and two drachms of cubebs, in four ounces of the mistura camphorata, make an admirable mixture when the balsam of copaiba alone is beginning
to lose its effect. Such, gentlemen, as it appears to me, is the mode of treating gonorrhœa which will best contribute to the maintenance of your own professional character, and to the welfare of your patients.

I shall now proceed to give you some of the consequences of Gonorrhœa, and first of Strictures of the Urethra.

These are of three kinds, the permanent, spasmodic, and inflammatory.

The permanent stricture is the result of a thickening of the urethra from chronic inflammation; the spasmodic arises either from a contraction of the muscles surrounding the urethra, or from the urethra itself; the inflammatory, in consequence of inflammation of the acute kind, which generally succeeds the acute gonorrhœa. This inflammation occasions an extravasation of adhesive matter between the corpus spongiosum and surface of the urethra.

At the commencement of the formation of every permanent stricture, you are made acquainted with the real nature of the complaint by the following symptoms:—the first is, the retention of a few drops of urine in the urethra, after the whole appears to have been discharged; so that when the penis has been returned into the small clothes, the linen becomes slightly wetted, and if you press on the under side of the urethra, a few drops more will be voided, which had collected between the neck of the bladder and that part of the urethra where the stricture is situated. The next circumstance you notice is an irritable state of the bladder; this is evinced by the person not being enabled to sleep so long as usual without discharging his urine. A man in health will sleep for seven, eight, or nine hours without being obliged to empty his bladder; but when he has stricture, he cannot continue for a longer period than four or five hours, and frequently much less even than this. The next circumstance observable is the division of the stream, the reason of which is, that the urethra is in an uneven state from the irregular swelling which surrounds it, and consequently the urine is thrown with an inequality of force against its different sides;
Symptoms of stricture.

sometimes the stream splits into two, becoming forked; sometimes it is spiral; at other times it forms, as it were, a thin sheath. Occasionally the stream rises perpendicularly, its long axis being at right angles to the long axis of the penis; thus, then, the retention of a few drops of urine after the whole appears to have been discharged, a more frequent propensity to make water than when in health, and the peculiar characters of the stream as just described to you, will be conclusive evidence of the existence of stricture.

In addition, there will sometimes be a discharge from the urethra, which renders the linen of a bluish white, similar to the appearances produced by nocturnal emissions; if the individual rides much on horseback, the urine will be high coloured, depending upon the degree of excitement existing in the urethra. The next thing which the patient notices is, that he discharges his urine by drops; and from the irritable state of the bladder, the water is constantly dropping or distilling away from the orifice of the urethra. An individual, then, having permanent stricture, first observes a few drops of water remain after the whole seemed to have been discharged—then notices a fine spiral, or divided stream—and, lastly, discharges his water by drops only; in this last state, for the purpose of facilitating the escape of the urine, and preventing its being retained by the lacunae of the urethra, he draws out the penis with considerable force, and thus endeavours to express it vi et armis.

Well, the next circumstance you observe, is the discharge of a considerable quantity of mucus along with the urine; this is owing to the inflammation having extended to the mucous membrane of the bladder; the urine, when discharged, is as transparent as usual; but when it has cooled, the mucus descends to the bottom, where it appears ropy and adheres to the vessel. As the inflammation of the membrane increases, the urine becomes yellow; but if heated, the yellowness is not seen: and when allowed to stand, as I before stated, the mucus will sink to the bottom. These facts will explain to you whether the urine contains mucus.
or pus. When the disease is of a very aggravated nature, the urine will become quite white, but in all the stages of the complaint, the colour of the water will be according to the degree of inflammatory excitement; and when very severe, it will be charged with a considerable quantity of pus.—When the urine is bloody, it is a proof that the ulcerative process has commenced: and if there be no blood, it is a proof that there are no ulcers.

In that state of stricture when the urine is filled with pus, the patient has frequent and severe rigors, or even below that state of inflammation the person will have frequent shivering fits, and upon going into his room you would suppose that he had an intermittent, and would order him bark. In these cases, however, this medicine has no effect, and you will find opium the remedy. I mention this that you may be upon your guard in those cases, as there are manifest rigors succeeded by severe heat, although they do not come on with that regularity that they do in intermittents, and at a different time of the day. In addition to these symptoms, piles will be sometimes produced, and occasionally direct inguinal hernia; this last complaint is the consequence of the extreme force that is employed to evacuate the urine.

Upon the dissection of those who die of stricture, (and I think persons not unfrequently die of this complaint, though not so many now as formerly,) the following circumstances are observed:—the seat of the stricture anterior to the bulb, just where it joins the corpus spongiosum; this part is naturally contracted and small, and it is here that you will be obstructed, if you attempt to pass a straight bougie. The next situation in which we find stricture, is in the membranous portion of the urethra, or that part between the bulb and prostate gland;—the next situation is in the prostate gland itself: there is no part of the urethra which is not liable to stricture, but most frequently it is found in the three situations I have described to you; first, just at the beginning of the bulb; second, at the membranous (or, as it ought more properly speaking to be called, the muscular) part; and, thirdly, in the prostate gland itself. Well, upon proceeding on our dissection, what we find to
result from stricture of the urethra is extraordinary dilatation of the urethra itself behind the stricture. There is a preparation in the museum where the stricture is one inch from the extremity of the penis, and the urethra has become so much enlarged, that it will receive the finger between the bulb and seat of stricture. The next circumstance we observe upon dissection, is an enormous thickening of the coats of the bladder; this arises from the increased action which the muscular fibres have to undergo, for the urine being frequently discharged, the muscular fibres contract to produce the expulsion, and thus increase in size in consequence of their increased action. Thus, then, recollect that in strictures the bladder is thickened and irritable.

Well, then, the next thing we observe is enlargement of the urethra, and this is owing to the urine collected in these tubes, from its not finding a ready passage into the bladder; therefore the ureters themselves become bladders. Proceeding in our dissection we often find the kidneys diseased, and their glandular structure entirely absorbed, and it not unfrequently happens that strictures will produce disease in the kidneys; which disease will prove destructive to life. In stricture, diseased kidneys prove advantageous in one point of view, which is the diminution of the secretion of urine; if this, however, continues for any length of time, the constitution will sink from the non-excretion of that fluid. One kidney is generally more affected than the other. I have just stated to you, that the glandular structure is sometimes entirely absorbed, and the kidney is occasionally, in cases of stricture, so distended with urine as almost to answer the purpose of a bladder. Well, such are the appearances found upon dissection of those who die of stricture.

Ever since I first began to lecture, I have always denominated that stricture of the urethra, which is produced as it were by a piece of cord tied round it,—the corded stricture. Another, that is produced as if by the tying of a broad band, the ribbon stricture; for it frequently extends a considerable distance, even the entire way from the bulb to the prostate. There is another species of
stricture occasioned by a membranous band running across the urethra.

[Preparations, shewing these varieties, may be seen in the Museum of St. Thomas's Hospital.]

The cause of permanent stricture of the urethra is inflammation of the chronic kind; this occasions a greater determination of blood to the part, and produces a deposition of adhesive matter on the outer side of the urethra; the urethra itself becomes thickened, which, together with being pressed upon by the adhesive matter collected in the interstitial spaces surrounding the urethra, produce the stricture in question.

As to the manner in which stricture is produced, I am opposed, on this point, to Mr. Hunter, one of the greatest surgical authorities that ever lived; and if asked what was the cause of stricture, I should say, in ninety-nine cases out of every hundred, it was the result of gonorrhœa. It is quite true that children, on whom not the slightest suspicion of their having gonorrhœa could fall, occasionally have stricture. I have lately met with a case of this description, and it was caused by the child having received an injury when on horseback; but still I would say, that in ninety-nine cases out of every hundred, stricture is the result of neglected gonorrhœa, riding or drinking hard, or any excess when the patient is labouring under that complaint.

There are three principal objects to be attended to; the first of which is, to cure the complaint by dilatation; the second, absorption; and the third, to destroy it altogether. The first is effected by mechanical means; the second, by the influence of medicines; and the third, burning it away by means of caustic. The first, or cure by dilatation, is accomplished by means of bougies; these are of various sizes, and made of either wax, elastic gum, catgut, or silver;—catheters are also sometimes employed, and answer the purpose tolerably well. Now, with respect to wax bougies, before introducing them into the urethra, you should always warm them by the fire for the purpose of rendering them soft, when, if they are introduced into the urethra, and pass through the stricture,
you will ascertain the distance at which it is situated from the orifice, and the form and size of the stricture will be modelled on the bougie. You then pass another bougie a little larger than the first, and directly that is withdrawn, another size still larger. On the following day you again introduce two bougies, that is, if there should be no existing inflammation to prevent it; the first bougie you then use is to be of the same size as the one with which you concluded on the previous day; after this has been withdrawn, you again pass another, a size larger than the first, thus using on every occasion two bougies always, beginning with one of the same size as that with which you had concluded on each preceding occasion. By adopting this plan, strictures may be cured in a quarter of the time that they usually are, and the strictured part of the urethra speedily made to regain its natural size. Bougies have been numbered from one to sixteen, so that surgeons may on each occasion know the size they are using and the size they last used; number sixteen is large enough for a walking stick, and evidently too big to be safely passed into any urethra; and number fourteen is of quite sufficient magnitude to establish the natural passage of any urethra. It is not necessary to let the bougie remain any length of time, for when the bougie has passed the stricture, the effect of dilatation has been produced.

Never attempt to pass a bougie in its straight state, for if you do, it will be obstructed in its passage, whether there be stricture or not; you should invariably give it, before its introduction, the curve of the catheter; with regard to elastic gum bougies, they are not now employed.

Every surgeon, I believe, has a mode of practice peculiar to himself; the bougie I use is made of silver, it is of the form of the catheter, but at the point, and running back for some distance towards the handle, it is conical; and the way I use it is this: I first pass down, in the manner described to you, a wax bougie, for the purpose of ascertaining the form, size, and distance of the stricture; having obtained a knowledge of these, I then introduce my conical silver bougie, the point of which, having entered the
stricture, the further it passes, the greater is the dilatation produced in consequence of the form of the instrument. This bougie I have found extremely serviceable, and is the best with which I am acquainted; when it is not at hand, I use a common silver catheter instead.

As to catgut bougies, they are now very rarely employed, except when the stricture is particularly small, and then they are sometimes required; there is another kind of bougie made of horse-skin, after it has been submitted to the action of lime to prepare it for tanning.

Fashion, I am sorry to say, in surgery as well as in medicine, frequently leads practitioners from the path of prudence; one remedy after another is blazoned forth to the world to delude merely for a day, and then to sink with its predecessors into "the tomb of all the Capulets." Surgery, however, is much less liable to these deceptions than the medical branch of our profession, because Surgery is a science requiring more solid information, and in which impositions are much more easy of detection. It often occurs that the exaggerated statements which accompany new remedies, lead surgeons to expect more advantages from their employment than the experience of the discoverer, if he had spoken truly, would have led them to anticipate; now in consequence of this, medicines often sink below that level where their intrinsic value would justly entitle them to remain. I make these remarks in reference to the use of caustic, for the cure of stricture, originally adopted by Mr. Hunter, afterwards improved upon by Sir Everard Home, and subsequently the mode of treatment was altered by another gentleman, now deceased, and since his time it has been falling into disrepute. The use of caustic has certainly been very much abused, and, in many instances, has produced the very worst consequences, and I would say, that it never ought to be employed, except where the stricture is accompanied with fistula in perinaeo, and that fistula behind the stricture, then there can be no apprehension of the caustic occasioning retention of urine, which it has done in many instances, when injudiciously employed. Caution is
required in the use of nitrate of silver to prevent its getting in contact with any other parts than where its presence is absolutely necessary; and let me advise you not to use the caustic alkali as a substitute for lunar caustic; it is much too soluble, and by running over an extended surface, is calculated to produce a great degree of inflammation. I have known eight applications of the lunar caustic completely succeed in curing stricture, when every other means had failed; in this case, there was a fistula in perinaeum, behind the stricture.

I have now to make two or three observations on the consequences of introducing bougies; there is a preparation in the museum in which you see the bougie forced out of the urethra into the scrotum, just by the bulb; there is another preparation in which the bougie was forced into the bulb itself. Now, whenever you suspect a laceration of the urethra in passing a bougie, immediately withdraw the instrument, and desire the patient, if possible, to retain his urine, that it may not irritate the wound, and also to prevent its escaping through the opening, and becoming extravasated in the surrounding cellular substance. In this way you give time for a clot of blood to form over the surface of the wound,—a slight degree of inflammation is excited, and it becomes healed by the adhesive process without any further mischief. Another circumstance I wish to mention to you is, that the passing of a bougie is sometimes attended with very considerable hemorrhage from the urethra. A practitioner once called upon me in a great hurry, but whose name I will not mention, for I do not wish to hurt him, although he is not at all calculated to practise surgery; well, this person called upon me and requested me to go immediately and see a patient of his, who had a profuse bleeding from the penis, occasioned by the introduction of a bougie; I went and found as he had stated; I pressed a roller upon the perinaeum, which instantly checked the flow of blood; a short time afterwards, I was sent for to the same patient from the hemorrhage having returned; this gentleman had been lounging before the fire, with a foot on each side of the chimney-piece; the warmth coming in contact with the perinaeum, had
brought on a renewal of the hemorrhage. I now made an incision upon the part, and divided the artery of the bulb; this operation completely succeeded, and the bleeding was permanently subdued.

After the violence of the gonorrhœal inflammation has subsided, you will frequently feel, along the under surface of the urethra, a number of small knotty tumours; these in the course of a short time successively discharge themselves into the urethra, and the swellings then subside. Sometimes these little abscesses break externally to the urethra, thus forming a double swelling; but the most frequent situation of abscesses of the urethra from gonorrhœa is in the lacuna magna, opposite to the frænum. These abscesses likewise form between the lacunæ and scrotum. When you feel an abscess moving about in the scrotum, and that abscess occurring after the inflammation attending gonorrhœa, you may be pretty sure that it has been formed in the lacunæ opposite the scrotum, and will prove troublesome to the practitioner and dangerous to the patient; for in this situation abscess after abscess will frequently form, until the patient sinks under the long continuance and severity of the disease.

The next situation in which we find abscesses that are produced by the same cause, is in the perinæum, giving rise to swellings there of considerable magnitude; the inflammation passes down the urethra, giving rise to great pain in making water, and still greater pain after having passed it; if the inflammation be not checked in its progress, it will give birth to these abscesses, which, if permitted to remain, will, at length, break through the integuments, and matter and urine will be discharged through the opening. The passage leading from the external wound to the internal, is exceedingly tortuous, so that upon introducing a probe, that probe will not directly enter the urethra; indeed, you will find some difficulty in getting it there, from the winding and irregular course of the canal which the matter has formed: the nature of the wound will at once shew you that the urine may easily become extravasated in the cellular membrane of the neighbouring
Retention of urine from abscess.

Parts. Abscesses of this description will sometimes give rise to retention of urine; a man thus circumstanced was brought into the other hospital; upon passing the catheter, I felt a something unusual while introducing it, which led me to examine the perinæum; I there found one of these abscesses, and upon opening it with a lancet gave the patient immediate relief; this then will prove one source of retention of urine, and it is caused by the pressure which the abscess makes upon the urethra.

The further extension of the inflammation will be the means of producing abscesses in the follicles of the prostate gland; these likewise will occasion retention of urine, and upon introducing a catheter to relieve this, it occasionally occurs that the catheter will enter an abscess, and a considerable quantity of matter will pass through it before any urine makes its escape; at length, after the whole of the matter has been evacuated, the cause of the retention having been removed, the urine can then be freely expelled from the bladder. It now and then occurs that the last two varieties of abscess I have mentioned, by being neglected, have led to the formation of fistula in ano; the true character of the fistula will be learnt by your observing a few drops of urine to run from it at different periods; this will of course convince you it is connected with the bladder.

Abscesses of the lacunæ of the urethra, arising from gonorrhœal inflammation, should be continually poulticed until the matter is discharged. After you are satisfied that it has once formed, it is not right to let the abscesses break of themselves. When, therefore, the hard knot that you feel in the urethra becomes converted into a fluctuating tumour, connected with the skin covering it, the sooner you open it the better. When the abscesses are situated in the lacunæ opposite to the scrotum, the treatment must be exceedingly prompt, for if it be not, you will endanger the life of your patient. Into these abscesses make early and free incisions; let your incisions be of considerable size, and a great deal larger externally than internally. I generally make these incisions in the middle of the septum at the anterior part of the scrotum. Now,
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when you are called to cases of abscess in perinæo, it is necessary that you should be particularly decisive in your management of these complaints for the purpose of guarding against that troublesome and dangerous disease, fistula in perinæo, for, owing to a variety of circumstances, it is exceedingly difficult to cure. When called to a case of abscess in perinæo, the best plan of treatment that you can pursue is immediately to introduce a catheter, made of elastic gum, (which is much less likely to injure the patient than a metallic one,) this will relieve the retention, and obviate much irritation; apply leeches and evaporating lotions to the swelling, and keep the bowels open by cooling laxatives. Well, if these measures should not succeed in dispelling the tumour, the moment that you can distinctly feel fluctuation, you should make such an opening with the lancet as will allow the matter to escape, to prevent its burrowing under the skin and producing additional mischief; it will save the patient much pain, and will probably lead to the speedy cure of the disease, which might otherwise prove not only protracted, but fatal. Remember, you are not only to open the abscess early, but keep introduced in the bladder a gum elastic catheter. An abscess of this description very much neglected, has been known to break into the rectum, and the urine to be afterwards discharged through that unnatural course. In the treatment of abscesses of the lacunæ of the urethra and perinæum, it is of the utmost importance that you should attend to the state of the patient's general health, for these abscesses often form in broken constitutions, and it is impossible that you can cure them while the system is in a depraved and debilitated state, you should therefore prescribe alterative, tonic medicines, nutritive diet, and country air; attention to the state of the constitution will sometimes cure these abscesses after every local remedy has failed.

Abscesses of the perinæum are often produced from the unskilful manner in which catheters and bougies are sometimes introduced, and by using bougies of too large or too small a size.

There are some cases of stricture so bad, so obstinate, that, use what instrument you will, and with all possible care, yet you will
not succeed in overcoming the resistance. There was a case in the other hospital lately, where I was under the necessity of cutting down upon a stricture, and immediately behind which was a urinary calculus; upon searching a little further I found a second, and then the catheter passed with ease into the bladder.

Well, I mentioned to you at another part of the lecture that urinary fistulae in ano sometimes exist, and that the introduction of a catheter into the bladder is not sufficient to cure them, as the urine will notwithstanding still continue to escape by the sinuous opening. Urinary fistula in ano, is fistula in perinæo and fistula in ano blended. The first case of the kind that I ever saw was in a gentleman from Kent; two surgeons attended him, one of whom was myself. The other surgeon injected the sinus; the patient was directed to introduce a catheter frequently: he came to town a short time afterwards, and told me that he continued to pass the catheter for six weeks, when, concluding that he was cured, he ceased to employ it. Thé urine, however, returned by its former course, and he again came to town for the purpose, if possible, of getting the unpleasant disease cured. What I did was to make the same incision in the perinæum, as is made by the lateral stone operation; my object was to divide the sinus into two; this succeeded in producing a complete cure.

The next subject to which I shall direct your attention is extravasation of urine from bursting of the urethra. This can never happen without the grossest neglect on the part of either the medical man or the patient, unless, indeed, the patient be in a situation where he cannot obtain surgical assistance; as individuals, for example, who are at sea on board ships that do not carry surgeons; it is a very dangerous complaint, and one that is always to be dreaded. I wish there were some legislative enactment to compel the commander of every vessel going a voyage of any distance to take a surgeon with him; if such a law were in force, we should see very few cases of this description, for the subjects of them are generally unfortunate sailors who have been so situated that they were incapable of procuring medical advice. You may see
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these poor fellows often brought into the hospital in the most horrid condition, from rupture of the urethra and the escape of the urine into the cellular membrane of the surrounding parts—the scrotum, in these cases, is of a purple colour, and extremely distended; you probably make an incision in the scrotum, for the purpose of discharging the urine; sometimes this will be successful, but at others the entire scrotum will slough, together with a considerable portion of the surrounding parts; nor is this always the worst that happens, for it frequently terminates in death. All these calamities might have been prevented by proper treatment; and when you see a case of this description, you should immediately make into the scrotum an incision, at least two inches in length—this incision should be in a direction upwards and backwards towards the nates; this opening will permit the urine to escape, and the irritation and inflammation which commonly take place would be, by this simple practice, completely obviated. This then is the method you are to adopt:—make a free incision for the purpose of allowing the extravasated urine to flow out; attend to the stricture, which was the cause of the accident, and your patient will stand a fair chance of recovery.

Where patients have surgical attendants, I again repeat that this accident ought never to occur.

I shall now say a few words to you respecting spasmodic and inflammatory strictures. The spasmodic stricture is usually, I believe, more or less connected with permanent stricture; and I am of opinion that the spasms commonly attack the muscular part of the urethra. Spasmodic stricture may arise from various causes, attacks individuals of all ages, and so recently as yesterday, I saw a little boy of only four years of age the subject of it. Common accidents, as fracture and dislocation, will sometimes give rise to spasmodic stricture; even an operation for aneurism will generate such a degree of irritation as to produce it.

Spasmodic stricture is generally unattended with pain. I mention this the more particularly, because the inflammatory stricture and the spasmodic have been confounded; whereas the one being
unaccompanied with pain, and the other having it distressingly severe, is surely sufficient to mark the diseases as completely distinct: even an irritated state of mind, or a mind deeply engaged in study, will occasionally influence the nervous system to such a degree as to produce spasmodic stricture of the urethra. This complaint usually comes on of a sudden, is unmixed with pain, and the first notice that a patient has of it is, that he experiences a difficulty in voiding his urine.

You should introduce a bougie, letting it steal gently along the urinary passage, and when it arrives at the strictured part, there let it rest for a short time; after this you should gradually push it forward, using only a very slight force, but continuing that force until you have succeeded in passing the stricture. Let the bougie rest for a minute or two in the strictured part, and then withdraw it; directly you do so, the person will be enabled freely to pass his urine. If you have not a bougie at hand, you may employ a catheter, and it will answer equally well; you must take great care, however, to use it gently, as I have just described. Other means are adopted, as the exhibition of calomel and opium; antimony has also been given, with a view of producing sickness and general relaxation; the warm bath has been also employed with the same view, as has the tobacco clyster. Mr. Cline employed the muriated tincture of iron, with decided advantage; he gave five or ten drops every two or three hours, and it succeeded when every other means had been unsuccessful. I have already mentioned to you that the warm bath is a remedy employed for this complaint. I now tell you that the cold bath has likewise been had recourse to, and with the most decided advantage. At this apparent contradiction you probably are surprised; however, such is the fact. Mr. Robert Pew, when studying at these hospitals, was attending a gentleman in Bishopsgate-street, who had spasmodic stricture. Mr. Pew, (and I mention it to his credit, for it shewed a reflecting mind,) recollecting that an immersion of his body in cold water always caused him to expel the contents of his bladder, recommended his patient to jump into
a cistern of cold water that was standing in the yard of his house. He did so, and the experiment completely succeeded; there was perfect retention before the immersion, but after it the urine was expelled with the utmost facility.

There are some very anomalous cases of spasmodic stricture. Mr. Western, a surgeon, was in a chemist's shop, into which a man came, and asked for half a pint of lime-water; this he immediately drank; upon being questioned as to what he took it for, he said that it was to relieve a retention of urine produced by stricture; the lime-water relieved him, for immediately after taking it, he passed his urine. Owing to constitutional peculiarities, medicines that will be successful with one patient, will fail in another. You must therefore have recourse to all, until the object be gained.

There is another equally quick in its approach, with the common spasmodic, but unlike it in being accompanied with excessive pain. A man will consult you with this complaint, and will tell you he has the most inordinate desire to make water, but cannot. After having prescribed for him, and he has left your house, he will return again in a few minutes, and say that he is in the most excruciating pain, and cannot bear it any longer; this kind of stricture is generally produced by the inflammation of gonorrhoea, but there is another mode by which it is caused, and that is the introduction of a bougie, for the passing of these, although done with care, will sometimes give rise to a violent inflammation of the urethra.

When a person comes to you having retention of urine, with dreadful pain in the urethra, you should immediately take blood from the arm, in such quantity as to produce syncope, administer purgatives, apply leeches to the perinæum, and put the patient into a warm bath; you will also, in this complaint, find antimony and opium in a state of combination particularly serviceable. It is highly improper to introduce either a bougie or catheter while the urethra is in the inflamed state just described; if used with
judgment and decision, the means I have stated will be sufficient to procure relief.

There sometimes exists an irritable state of the urethra; if attended with inflammation, it is of the chronic kind. Persons having this complaint have a frequent desire to make water; this disorder may be cured by giving, three times a day, an eighth part of a grain of the oxymuriate of mercury, and a drachm of the nitrous spirit of æther; these may be taken in any convenient vehicle—should be continued for a little time, and the complaint will disappear.

LECTURE II.

The first subject on which I shall this evening engage your attention is, enlargement of the prostate gland. There are three species of disease, exclusive of the formation of calculi, by which this gland is affected; now the one which I shall first describe to you is, acute inflammation of the prostate gland.

This complaint is not confined, like the chronic enlargement, to late periods of life, but attacks persons of any age, and generally terminates in suppuration. The most prominent symptom which characterises this complaint is violent pain immediately after discharging the urine, and in this respect the disease resembles stone. As the inflammation advances, the swelling of the prostate produces retention of urine; this may be relieved by a common catheter, it will answer the purpose well, and for this disorder the prostatic catheter will not be necessary. Well, having passed a catheter, matter comes away through it, and the person for a time will be relieved.

The medical treatment of acute inflammation of the prostate gland, consists in taking blood from the arm, and administering mild laxatives, together with antimonial medicines. Generally speaking, the disease is not so clearly manifested by the symptoms,
as to satisfy your mind of its true nature, until the matter escapes by the catheter; this, coupled with the other appearances, stamp its true character. Rigors do not attend the formation of this matter.

The next kind of enlarged prostate that I shall describe to you, may be called the chronic. It is the consequence of age and not disease. When this affection produces partial retention of urine, it should be considered as a salutary process, for it prevents incontinence of urine, which, in old people, would be almost constantly taking place, were it not for this preventive. It makes the urine pass slower than natural; but this may be excused when it is the means of preventing a continual wetting of the clothes. Well, then, the first circumstance by which you know that an old person has chronic enlargement of the prostate gland, is the length of time he requires for the purpose of voiding his urine. You all of you must have observed, that an old gentleman is twice as long, when engaged in this process, as a young one, and this is the first thing that attracts the patient’s attention. Well, the next thing noticed is, that the urine becomes of a particularly powerful smell; this arises from its being ammoniated, in consequence of some urine remaining in the bladder after each discharge; remember, therefore, that in this complaint, the whole of the water, each time it is attempted to be expelled, does not pass away. The next symptoms observable, are pain and numbness in the glans penis;—the prepuce not possessing its usual sensibility—sense of weight and uneasiness in the perineum, which are relieved with pressure by the finger; pain in the back of one or both thighs, in the loins, and at the origin of the sciatic nerve and course of the ureters; the faeces are flattened, the reason of which is, that pressure has been made upon the rectum by the swoln gland. Persons having enlarged prostate for any length of time, generally have likewise prolapsus ani and hemorrhoids; when the enlargement of the gland is considerable, the patient will kneel, resting upon his hands with his knees widely distended, and thus continue for a tedious time to pass only a few drops of urine, after the most persevering efforts, and in the most excruciating pain.
Besides, what I have already stated, the ammoniacal smell of the urine, as the disease advances, becomes highly offensive, and at length the urine itself becomes white or milky; this appearance shews that the inflammation has extended to the mucous membrane of the bladder. If the urine be retained much, it has the appearance of coffee, occasioned by an admixture of blood with it; this leads many practitioners to suppose for the moment that the case is one of stone; but if you question the patient for a few moments, your doubts on this point will be removed. If you desire him to stand up and jump firmly on the floor, he will do so; if you ask him whether he can ride over a rough road without much pain, he will tell you that he can. Such doings and replies as these you would not obtain from a patient with stone.

At length the enlargement of the prostate, in many cases, will proceed until it occasions complete retention of urine; this, however, may be the effect of retaining more urine in the bladder, and for a longer period than it ought, or it may have been the result of checked perspiration, either from cold weather, or from having imprudently laid aside some flannel covering; when the retention has been brought about by either of these latter mentioned causes, in conjunction with an enlarged prostate; exciting on such persons violent perspiration will often afford a means of relief.

When you introduce a catheter into the bladder of a patient having chronic enlargement of the prostate, you will find the urine of a very high colour, and of an exceedingly offensive smell. Well, then, such are the symptoms which accompany this kind of enlargement of the prostate gland; at least they are such as I witness.

Upon dissection of those who have died with this disease, (and without dissection we know nothing at all of the matter,) the prostate is found enlarged sometimes laterally, but most frequently the enlargement is in the posterior part, situated in the middle or third lobe. Well, as the prostate enlarges it becomes pushed forward, and in consequence of this the urethra becomes curved immediately before the apex of the prostate; indeed, the coming forward of the prostate causes the urethra almost to double upon itself. The curve thus formed is
situated at the symphysis pubis; it is in this situation that the difficulty is found on passing the catheter in diseased prostate. Well, tracing on the course of the urethra, that canal behind the curved part is seen much enlarged—the next thing we notice is that the urethra itself is considerably elongated, that is, from an inch and a half to two inches; this increase of length is behind the pubis, and it is owing to this circumstance that you are under the necessity of carrying on the catheter so great a distance after its point has passed the arch of the pubis. Well, then, as to the prostate itself, we find that it may increase to a most enormous size laterally without giving rise to retention of urine. But that enlargement which occurs posteriorly in the third lobe, frequently occasions retention of urine, for the enlargement is situated immediately behind the orifice of the urethra; thus the urine collects behind the swelling, presses it upon the mouth of the urethra, and forms a complete barrier to its passage. It is of great importance for you to understand this; indeed a correct knowledge of the morbid anatomy of the parts is altogether of consequence, because if you have not this information you would find the greatest difficulty in the introduction of the catheter, whereas if you possess it, there will be no difficulty at all, and the urine may be drawn off with the greatest facility. It was owing to the imperfect knowledge of the anatomy of these parts that retention of urine formerly proved so often fatal, which occurrence is now very rare; the reason is that within the last forty years frequent dissections have caused these diseases to be well understood, and an improved mode of treatment has been the result. Well, then, although the enlargement of the middle lobe of the prostate will give rise to retention of urine by plugging up the orifice of the urethra, yet the lateral enlargement, although of great magnitude, does not occasion any such effect. That you may be enabled perfectly to comprehend what I have been stating to you, I will send round for your inspection different specimens of the diseases which I have noticed.

Well, gentlemen, behind the prostate, we frequently find sacs formed in the coats of the bladder. These sacs are produced in
the following manner: the muscular fibres of the bladder give way, and between these fibres the mucous membrane protrudes; thus in reality the sacs are elongations of the mucous membrane.

We also find the bladder much enlarged in this disease; the ureters likewise, and also the pelvis of the kidneys*.

Well, then, when diseased prostate exists, how are you to know it? what are the diagnostic signs? Why, the enlargement laterally may be readily ascertained by introducing the finger into the rectum, but the enlargement of the middle lobe cannot be so learnt. Well, then, how? Why, by the introduction of a catheter or bougie, and the latter is the best; it will be found to stop suddenly. For the purpose of drawing off the water, you are then to introduce a catheter; the instrument will be resisted in its common course, and you must depress the handle exceedingly, with a view to tilt its point over the enlarged gland; thus the end of the instrument will be rising perpendicularly, as it were, behind the pubis.

These, then, are the means you are to employ to obtain a correct diagnosis. Now, with regard to the cause of retention of urine, in those cases of enlargement of the prostate where the disease exists in the third lobe, it generally arises from the urine having been allowed to remain in the bladder for too long a period, thus collecting in so large a quantity that the swollen lobe is pressed forward against the mouth of the urethra, and thus closes the entrance to that canal.

With regard to the causes of enlargement of the prostate, it is often the result of libidinous age; old people frequently feel a greater degree of excitement than the constitution is capable of supporting, and disease is the consequence; powerful excitement is by no means desirable for aged individuals.

I shall next proceed to consider the treatment of enlarged prostate. Very little can be effected here by medicine; it is a disease over which medicines have but very slight influence; you may, however,

*Treatment of enlarged prostate.

* Or Infundibulum.
give the bichloride of mercury in very small quantities, for I believe that I have seen it produce a beneficial result. But this is the treatment only for the enlargement of the gland; well, but when retention of urine takes place, what plan of treatment are you to adopt then? When no urine whatever can be passed, and when there is great pain at the neck of the bladder? Why you must take blood from the arm, apply leeches to the perineum, administer purgatives, and put the patient into a warm bath.

If these means should succeed in procuring relief, the best medicine that can afterwards be given for the purpose of preventing a return of the retention, and at the same time with a view of lessening the inconvenience which sometimes attends the complaint, is composed of fifteen drops of the liquor potassæ, five drops of the bals. copaib., and an ounce and a half of mist. camphor.: if you give fifteen, or twenty drops of the balsam, it then produces a stimulating effect, and does harm; administer it in the quantity that I have just mentioned to you, in conjunction with the other medicines, to which you may add 5ij. mucilag. gum. acac. I was attending, with Dr. Key, a gentleman from the country, having this disease, and in whom it proved a source of much annoyance; we at first gave him ten drops of the balsam, with the other medicines; this quantity, however, was found too stimulating; the dose was reduced to seven drops, and ultimately to five; after continuing it for a short time, we had the pleasure of sending this gentleman back to the country very much relieved. This medicine is by far the best remedy for this complaint, that I am acquainted with. Other medicines, as the carbonates of soda and magnesia, the liquor potassæ, and opium, are occasionally given, but as the latter produces costiveness, it is decidedly improper. I can assure you with much confidence, that the first medicine I described to you, will be found the best. It will afford considerable relief, which is all that you can expect, for you must not dream of obtaining a cure. When you are called upon to relieve retention of urine, from enlarged prostate, by the introduction of a catheter, the instrument should be fourteen inches in length, and a quarter of an inch in dia-
meter. In consequence of the pressure within, a broad instrument will answer better than a narrow one, for being bulbous at the end, it will readily ride over the enlargement. When introducing the catheter, you will meet with no difficulty until you reach the curve which the enlargement of the gland has produced in the urethra; the handle of the instrument is to be here slightly raised, for the purpose of insinuating the point through the curved part; having passed this, you are then to depress the handle completely between the thighs, so as to bring the point of the instrument immediately to rise perpendicularly above the pubis. Well then, that is the whole of the difficulty of introducing the catheter in this disease, more than is experienced under ordinary circumstances; recollect after having passed the curved part of the urethra, the situation of which I have already explained to you, you are then to depress the handle as much as you possibly can; this will cause the point to enter the bladder between the pubis and enlarged lobe.

If any gentleman within these walls should ever be under the necessity of puncturing the bladder for enlarged prostate, which I trust in God he will not, it must be done above the pubis, but it never need be attempted at all, if you can perform your duty. I have known enlarged prostate occasionally occur in very young people; an instance of this kind happened in St. Thomas's Hospital; a boy was admitted, having symptoms of stone; but before I say more of this, while I think of it, I want to add a few words on the treatment of diseased prostate. An elastic gum catheter is sometimes kept introduced into the bladder; in passing an elastic gum catheter, the removal of the stilette will sometimes cause it to enter with ease, when it would not previously pass at all. If it be deemed requisite to leave the catheter in the bladder, I should prefer one of pewter rather than elastic gum, for it can be curved down before the scrotum, and by plugging up the end, the patient may move about as he likes, and at any time he wishes can expel his urine; thus the instrument becomes productive of great comfort; let me observe to you, that if you employ a pewter catheter, it should be quite new, and not worn for a longer period than a fortnight, for the urine acts
upon the metal, renders it brittle, and will probably cause the instrument to snap if the time be extended beyond what I have stated. I just now mentioned to you, in reference to young persons having enlarged prostate, that a boy was admitted into the other hospital, having symptoms of stone, in consequence of which he was sounded, and the operation of lithotomy was going to be performed; the sounding, however, brought on inflammation of the bladder, which terminated in the boy’s death; upon dissection it was found that the symptoms for which he had been sounded were produced by an enlarged prostate gland. I have one other observation to make; persons will come to you for some supposed complaint in the bladder, and upon inquiry, they will tell you, that they can pass their urine; now, if the disease consists of enlarged prostate, some urine will still remain; desire them, therefore, to make water, and then introduce the catheter: if the case be one of enlarged prostate, you will be enabled to draw off from half a pint to a pint of urine, having a strong ammoniacal smell. A gentleman about six weeks since called upon me, whose case was similar to what I have just stated; upon inquiry as to whether he had passed his urine, he told me he had just done so; upon introducing the catheter, I drew from his bladder a pint of urine, having a highly offensive ammoniacal smell. You have only to teach a patient who is thus circumstanced, however, to introduce the catheter for himself, and his danger will be at an end.

The last circumstance connected with the prostate which I have to mention to you, is that you will sometimes find fungous polypi growing from its base. There is a preparation in Guy’s Hospital in which you have an opportunity of seeing the nature of the disease. This specimen was taken from a man who lived in the neighbourhood of the hospitals. A catheter was passed into the bladder of this man, in consequence of retention of urine. For nearly the whole of the day on which the instrument was introduced, he expelled nothing but blood; other attacks succeeded this, and at length he died. The preparation now before you was taken from his bladder. I am not aware of any plan of treatment
that is likely to be successful for the removal of this disease; it appears to be entirely out of our reach.

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LECTURE III.

The first subject of which I shall speak, is irritable bladder.

During the latter stages of gonorrhoea, it often happens that the patient is annoyed by a frequent desire to void his urine; this symptom at length becomes so urgent that the inclination to empty the bladder occurs as often as every ten minutes or quarter of an hour. The pain that the patient feels is in exact proportion to the quantity of urine contained in the bladder; the greater the quantity the more severe will be the pain. Sometimes in this complaint the urine will be mixed with blood; this appearance is calculated to deceive you and excite a suspicion of the existence of stone, and induce you to pass a sound for the purpose of satisfying your doubts. Now in this disease the introduction of an instrument into the bladder is highly improper, as it would produce additional irritation. The mode by which you can distinguish irritable bladder from stone is this: attend to the state of the bladder when the patient is in pain, and when he enjoys repose; if the case be one of irritable bladder, there will be no pain after the expulsion of the urine; on the other hand, if the case be stone after the expulsion of the water, then will the pain be felt; by attending to this you may readily distinguish one complaint from the other. In irritable bladder, therefore, the pain is felt when the bladder is full; in case of calculus, the pain tortures when nothing but the stone remains. Sometimes the disease goes on to produce ulceration of the bladder; the urine will then be mixed with blood, there will likewise be a discharge of bloody mucus, and the inclination to void the urine will be more frequent and exceedingly urgent. Cancer of the uterus is probably a more painful complaint than any other, but with the exception of that disorder, I am not acquainted
with a single one which tortures to such a degree as ulcerated bladder. Irritable bladder of itself is a dreadful disorder; the patient's life is a burthen to him, he is obliged to keep from society, and linger away his tedious hours in solitude; this disease, formidable as it is, may be brought on by very slight causes; even the retention of the urine, from motives of delicacy, beyond that period when there was a desire to discharge it, has been known to give birth to this horrible affliction. A young gentleman with a party of ladies was about to leave them for the purpose of making water, at the moment when the latter called their carriage; he thought that it would be indelicate to withdraw, and accordingly got into the carriage, having at the time a strong desire to pass his urine; in the greatest agony he rode twelve miles with his bladder full, at which time, having arrived at the end of their journey, he endeavoured to make water, when, to his utter astonishment, he could not void a drop; a surgeon was sent for, who took away the urine by means of a catheter; this afforded relief; but irritable bladder followed, then the suppurative process, and at last the sufferer died from exhaustion.

Upon dissection of those who die of irritable bladder, the mucous membrane has been found in a state of extreme vascularity; the quantity of blood in the vessels rendering it as florid as red velvet. A respectable surgeon of Finsbury Square, attended a patient for another disease, of which he died; the individual had however for a long period been the subject of irritable bladder, and on examination of the body, the disease had been so protracted, that ulcerated spots were seen in different parts, and the mucous membrane had nearly been removed; that part which remained was uncommonly vascular, and resembled the tunica conjunctiva when under the influence of acute inflammation. Well, then, I can state to you that irritable bladder is sometimes the result of gonorrhœal inflammation; at others is caused by retaining the urine too long.

Now then, as to the treatment required. Your first object should

Cancer uteri and irritable bladder.

Dissection.

Treatment.
be to keep the bladder in a state of rest; nothing can be done without it. Opium should be given in doses of from one to two grains, with a view of allaying the pain and irritation, and with the same object five or six grains should be introduced into the rectum in the form of suppositories. You may also administer opium in conjunction with the liquor potassæ; as the former, however, occasions costiveness, you had better combine the latter with some bitter tincture. A confined state of the bowels, is to be obviated by the exhibition of castor oil. After shaving off the hair, a blister should be applied over the region of the pubis, the counter-irritation thus produced will prove of infinite service; there is a foolish prejudice against the use of blisters in complaints of the bladder, from a belief that the cantharides become absorbed—this is false theory.

To keep the bladder in a state of rest, a short catheter should be kept introduced; the instrument should only just enter the bladder; you know that the length of the urethra scarcely ever varies from nine inches, consequently you have no difficulty in knowing the length of the instrument that you ought to pass; a flexible catheter is the one that you are to employ, and after sufficient has been introduced, the remainder may be cut off; it should be tied to a bandage carried between the thighs and round the loins. The instrument thus used will afford great ease and keep the bladder at rest, by allowing the urine to escape as fast as it streams from the ureters, thus keeping the bladder continually empty. If the bladder should be ulcerated, it ought not to prevent this method of treatment, on the contrary, it is the best that can be adopted, for, by keeping the bladder at rest, you afford the sores an opportunity of healing; this then is the treatment for irritable and ulcerated bladder.

Mucous disease of the bladder, or it might be denominated catarrh of the bladder, is known by the discharge, from the urethra, of an enormous quantity of ropy mucus; it is so thick that it will hang to the sides of the vessel, and is of a yellow
It is produced from the internal surface of the kidneys, ureters, and bladder. I this morning saw a gentleman having this complaint, and it had existed for two years.

The treatment is as follows:—introduce a short catheter as in the last case: let your medical treatment consist in the exhibition of oxymur. hydrarg. gr. $\frac{1}{3}$ ter die; and likewise three times a-day you should give $\frac{1}{2}$j spir. æther. nitrici in $\frac{3}{2}$iss mist. camphor. Persons having this disease should drink plentifully of soda water. But the best remedy that they can possibly take is the balsam of copaiba; no medicine so completely robs the urine of mucus as this. Eight or ten drops three times a-day will usually be found quite sufficient: it may be given in conjunction with the medicines before mentioned, or in $\frac{1}{2}$j mucilag. gum. acac. et $\frac{3}{2}$x aq. font.

Now and then a paralytic state of the bladder occurs. In early life a case of this kind for the moment very much surprised me; a man came to my house stating that he could not make water. I made him lie down on three chairs, and then without the least difficulty introduced a catheter; but to my astonishment not a drop of urine came away: and I was the more astonished, as I could distinctly feel the instrument above the pubis; I desired him to rise from the chairs and stand up: well, the moment he did so the urine directly began to flow in a full stream; this arose from the weight of the superincumbent viscera pressing on the bladder, and although the urine flowed freely while in the erect posture, yet when the body was horizontal not a drop would escape. He was cured by blistering the loins, and by giving him a pill twice a day composed of five grains of the Chio turpentine, and a quarter of a grain of powdered cantharides: by these means the voluntary power of the bladder became restored.

It occasionally happens that persons will be troubled by frequent bleedings from the kidneys. I knew a female who was annoyed in this way for more than three months.

In these cases you must order the recumbent posture to be rigidly adhered to, in order to give the vessels an opportunity of closing. The bals. copaib. should also be prescribed in small
doses. The diet should be low. Recollect there must be no change from the recumbent posture until some time after the bleedings have ceased, and deviations from this rule will frustrate your curative intentions.

The next disease to which I shall direct your attention is chordee. The name may make some of you smile, at least those of you who have not felt it. A chordee is a painful erection of the penis, and during the erection, the penis is drawn either violently back or to one side. The cause of the complaint is an inflammatory condition of the corpus spongiosum, and the pain is produced by the dilatation of the vessels, from the influx of blood to cause an erection. The disease is most troublesome at night, when the patient is warm in bed; and one ingenious gentleman, with a view to keep the parts cool, invented a tube to pass between the legs from the outside, for the purpose of admitting a current of cold air.

The treatment consists in the application of poultices, fomentations, and leeches. During the night the penis may be enveloped with linen, wetted with the lotio. plumb. subacet. Evaporating lotions may also be employed; the best medicine that you can give is thus formed:

\[ \text{R: Liquor. potass. m. xx.} \]
\[ \text{Extr. conii. gr. ii.} \]
\[ \text{Mist. camph. 3x.} \]
\[ \text{Ft. haust.} \]

It should be taken three times a day, and will be attended with the best effects. Calomel and opium may also be administered with much advantage. You may give a pill every night composed of a grain of calomel, a grain of opium, and two grains of camphor—this will be found to materially abate the pain, and will be productive of much soulagement. To get rid of the hardness which often remains after the painful erections have disappeared, you should rub the part with the ung. hydr. camphorat. and apply some of the same ointment spread on umbrella silk; by pursuing this plan of treatment the hardness will generally disappear.
There is a chronic chordee, of which I wish to say a few words. It is of this kind: sometimes after a person has had gonorrhoea very severely, the dorsum of the penis will become so extremely hard as upon examination to feel as if ossified. To remove this hardness you should direct the liniment, hydrarg., to be rubbed on the part night and morning; or you may order it to be kept covered by plasters of the cerat. saponis; this acts like a poultice, and when the complaint is recent, will answer very well; but when of long standing, you must have recourse to the liniment, hydrarg., and even this will often fail, owing to the extremely thickened state of the tendinous sheath of the dorsum.

We are sometimes called to persons having considerable hemorrhage from the urethra. It sometimes occurs from the rupture of a vessel during inflammation; at other times, and more frequently so, it is caused by the introduction of a catheter or bougie.

From whatever cause it proceeds, the treatment is very simple:—press the finger and thumb upon the urethra, deep in the perinæum, and observe if you command the bleeding; if you do not, bring your hand a little nearer towards you: proceeding carefully in this way, you will at last learn the precise spot from whence the blood flows, which you will generally find to be from that part of the urethra opposite the symphysis pubis. If you continue to press with your finger and thumb for a quarter of an hour or twenty minutes the bleeding will cease; but as this would be tedious and often inconvenient, a compress placed upon the part, and secured by a roller carried round the loins and brought up between the thighs, will answer equally well, and perhaps better, as it may be worn for an hour or two if deemed necessary. I have gone into a room and found a person soused all over with water in consequence of a bleeding of this description; such a practice is useless and absurd. You may give to the patient some aperient medicine, and to lessen the disposition to hemorrhage you may take blood from the arm.

The next subject to which I shall call your attention, is inflammation of the testicle and epididymis. This complaint, from an
error of pathology, used to be called hernia humoralis, in consequence of a belief that it arose from a fluxion of humours to the testicles. The inflammation of the testicles generally shews itself from within ten to fourteen days after the appearance of the gonorrhœal discharge. The first symptom indicative of inflammation of the testicles, is a sensation of a drop of urine in the perinæum; at this time the inflammation is proceeding down the urethra, and before it reaches the testicle, affects the prostate, verumontanum, vasa deferentia, proceeds up the cord to the abdominal ring, then attacks the epididymis, and finally the testicle itself; while the inflammation is confined to the epididymis the patient feels little or no pain, but when it has passed to the body of the testicle, then there will be felt excessive pain, in consequence of the unyielding nature of the tunica albuginea. The scrotum is sometimes reddened, arising from the degree of violence which characterizes the inflammation. The pain does not, generally speaking, correspond to the continued course of the inflammation just now described to you, and in fact the inflammation itself often appears less regular in its progress. The introduction of a bougie is a common cause of this complaint; and let me tell you, that when it gives much pain or excites inflammation, it should not be used for three or four days together, but rather at intervals of three or four days.

The treatment to be pursued is, first, to order the patient a suspensory bandage, (indeed if the gonorrhœa be at all violent, it is not right to attempt its cure without one; it will often prove a preventive to inflamed testicles.) Well, then, first order a suspensory bandage; give the patient two or three calomel and colocynth pills, and in the morning a dose of infusion of senna, with sulphate of magnesia. Apply to the testis a lotion composed of one ounce of spirits of wine and five ounces of water; or, muriate of ammonia and water and a small quantity of the spirit. These means usually succeed in overcoming the disease; if they should not, you must take blood from the scrotum, but not by the application of leeches, at least not in private practice, as the mess they produce would in
all probability lead to an exposure of your patient's malady; therefore, what I do is this, I direct the patient to stand before me, and making the skin of the scrotum tense, I open three or four of the veins with the point of the lancet; then, by fomenting the scrotum with a little warm water, or directing the patient to stand before a fire, in five or ten minutes you obtain as much blood as is requisite, and by then making the patient lie down, the bleeding will immediately cease; thus, by this method, in a few minutes you procure more blood than you would in double the time by the application of leeches, and without any exposure. The weight of poultices is an objection to their employment; but fomentations may be prescribed with advantage, as they unload the vessels, and act beneficially in the same manner as leeches. At the same time, purgative medicines should be freely administered. In some irritable constitutions, even all the remedies which I have named will not be successful, the pain and inflammation still continuing, and you are under the necessity of having recourse to opium; the best form in which it can be given is that of the compound ipecacuanha powder. I prescribe ten grains of this and two grains of calomel to be taken at night; sometimes I order them night and morning. Dover's powder and calomel thus combined, without exception, form the best remedy that I am acquainted with for subduing irritable inflammation, and after the operation of purgatives, you will find them of infinite service. Well, it sometimes happens that, notwithstanding all we can do, abscesses in the testicle will form; we must then apply poultices and fomentations for the purpose of bringing them to a speedy issue. After the discharge of the matter, should any sinuses remain, you must inject with a solution of sulphate of copper, in the proportion of two grains to an ounce of water; diluted sulphuric acid is occasionally used, but I give the preference to the former. The reason that there is so much difficulty in getting these sinuses to heal is, that the semen is a fluid which is constantly secreting day and night, consequently the adhesive inflammation is interrupted in its progress.
From these sinuses funguses frequently sprout out. The treatment consists in paring them off at their roots, or rather in the application of the nitras argenti either solid or in solution, and then bringing the edges of the external wound in contact. These funguses are not of a malignant nature; they resemble those that occasionally shoot from the brain.

Well, a few words more, and then I will conclude.

This sometimes takes place, and is produced by two causes—absorption and ulceration; here (shewing a preparation) is an example of this; when this effect is produced, it is generally in lads from fourteen to seventeen years of age. It is a curious circumstance, that if a boy of fifteen or sixteen gets a gonorrhœa, that it is often succeeded by a wasting of one or both testicles. This effect is not the result of gonorrhœa only, but any cause producing inflammation of the testis in very young persons will now and then lead to a similar misfortune. I have known it happen in consequence of blows from cricket bats and balls. The only treatment likely to prevent their entive decay is probably to employ them, to render them active, before the whole of the glandular structure has become destroyed. If, however, the inflammation of the testicle has been severe, that alone is sufficient to de-range the glandular structure in very young persons. I have known both testicles waste from the formation of scrofulous abscesses: such cases are truly deplorable.

LECTURE IV.

Gentlemen, having at a former time treated of chronic enlargement of the testicle, and irritable testicle, I shall proceed this evening to consider sympathetic bubo.

Sympathetic bubo is usually the result of inflammation of the glans of the penis. The inflammation extends on the outward surface of the glans, the absorbents of the dorsum of the penis
become enlarged, and if you rub your finger along the dorsum you feel them hardened like a knot or cord, and frequently connected with the glands near the pubis. A bubo of this kind rarely suppurates; now and then you will meet with one that suppurates, but only in very irritable constitutions. When the inflammation extends from the penis to the glands of the groin, these become inflamed also, and enlarged, and it is not at all surprising for a swelling after a gonorrhœa to come on in the groin; a patient under such circumstances is afraid of a bubo, and alarm is excited in his mind of its being syphilitic; you may, however, calm his fears, and tell him that it is a common concomitant of gonorrhœa, and that he need not be uneasy. The distinction between a sympathetic bubo and one from syphilis, consists in this circumstance:—in general, one gland only is enlarged in syphilis, but in a sympathetic bubo, you most frequently find a chain of glands affected; in the groin there are two sets of glands, one just above Poupart's ligament, and the other about two inches or an inch and a half below it. The lower tier is seldom enlarged from sympathy, the upper frequently. Whether the gland will suppurate or not depends greatly on the mode of treatment—if mercury be given, it will be hurried into a suppurative process, therefore it should not be used, so as to produce a mercurial action in the system; connected with aperients it is proper. The plan of treatment in sympathetic bubo is the same as that for inflammation in any other part of the body; you purge the patient, apply leeches and an evaporating lotion, and advise him to diminish his quantity of exercise. By this plan it soon gives way, and it is his own fault if it suppurates. The glans penis is covered with a plexus of absorbents, and by making a small puncture in the skin of the dead subject, and introducing some quicksilver under it, those of the dorsum receive the mercury, and by this means you inject the glands of the groin. Irritation by sympathy, or from the venereal virus, extends in this direction. The plexus on the glans becomes inflamed, the absorbents on the dorsum irritated, and then the glands of the groin enlarged;
they are enlarged by a continued sympathy rather than the symp-
athy by which one part becomes affected by another at a dis-
tance from it; it is by a continuation of the inflammation, which
commences at the mouth of the absorbents and terminates in the
gland.

The disease of which I shall now proceed to speak, is pro-
tracted in its length and difficult to cure; but first I have a few
words to say on the nature of gleet. Gleet is said to be that
stage of gonorrhœa when the discharge ceases to be infectious.
I doubt whether there is such a complaint as gleet accord-
ing to this definition, for I cannot help believing that a gonorrhœa never
ceases to be infectious. Gonorrhœa when neglected sinks into a
gleet, and is known by the change of the colour of the discharge,
and the pain attending the inflammatory stage ceasing. In this
state is the discharge infectious or not? I doubt myself whether
a gonorrhœa ever loses its power of causing infection as long as
any discharge from the urethra remains, and I will give you my
reasons for this opinion. A married gentleman went to Lisbon
from this country, and whilst at a distance from home, departed,
as too many do, from the path of virtue, and went astray. The
Portuguese lady with whom he cohabited took care to give him a
clap that he might not forget her; he returned to England, and
at the expiration of five months and three days after first observ-
ing the gonorrhœa, he called on me and asked whether he might
return home with safety to his wife? He said that he had a little
discharge, and wished to know if, after having had it five months
and three days, it were possible for it to be infectious? I replied
certainly not; you may go home, there is no danger of your
giving it to your wife. He went home, and unfortunately gave
his wife a severe clap. I attended both the parties afterwards,
and was extremely sorry for what I had done; but I thought, at
the time I gave the advice, that a gleet was not infectious. But
I think differently now, and believe that after a continuance of
several months, the discharge is infectious. A gentleman from
the north of England, and who had been recently married, came to
me and said that he had communicated a gonorrhœa to his wife. Shocked at such an occurrence, I said, how could you think of acting in such a manner? Why, sir, for fourteen months prior to my marriage, I had a gonorrhœa; I made various attempts to get rid of it, and had a variety of advice about it, but a yellow discharge always continued. I was told by every body that it was not infectious; and not till after such repeated assurances did I get married: the consequence however is, that my wife has a severe pain in making water, and a copious discharge. I visited her, and found her in this state; she was some time under treatment before she quite recovered. From what I have seen, I do hold that a medical man is not warranted in saying that a discharge of a gleety kind is not infectious. If the discharge is from a stricture, it does not produce infection. If the discharge is from an abscess in one of the lacunæ, it may be always known by its being absent for a week or more, and then flowing profusely: but not so in gonorrhœa; the discharge is generally suspended for some time, in an abscess of one of the lacunæ, and then returns, which is not the case in a clap; and the matter from an abscess of the lacunæ is not infectious, whilst the discharge which begins a gonorrhœa, and terminates in a gleet, never loses its power of producing infection. Women of the town, who frequently have a gleet on them, would not perhaps communicate a gonorrhœa to a debauchee; but let a man fresh from the country have intercourse with a woman under such circumstances, and he would immediately have a clap. I need not tell you what gleet is. The discharge is generally transparent at first, afterwards yellow, and if there be much excitements, green. If the excitement be very considerable, the discharge will be tinged with blood. Gleet is rendered purulent and bloody from excesses of different kinds. In this state, if you examine the urethra after death, you will find the following appearances:—inflammation extending for two or three inches down the urethra, and if the urethra be laid open for twenty-four hours, it will be quite
florid as far as the seat of the gleet, but pale in the other part. The discharge does not proceed from the vesiculæ seminales, or Cowper's gland, or the prostate, but from the lacunæ, and what you hear about seminal weakness is nothing but folly and absurdity; there is no truth at all in it. The discharge commonly called gleet proceeds from the lacunæ of the urethra. A discharge now and then comes from the vesiculæ seminales, through the urethra; when a person has a costive motion, a drop or two of mucus, or of a ropy fluid proceeds from the vesiculæ seminales, and is quite a different case from that called gleet; both are different as to their seat and origin; one may say with certainty, from the nature of the discharge, when it proceeds from the vesiculæ seminales. I was attending a gentleman once, for obstinate stricture, on whom I frequently used the caustic bougies; one day I called on him, and he said to me, "Well, sir, you have produced a considerable discharge from the urethra, and I have communicated it to my wife; she has considerable pain on making water; and whilst voiding her urine she is obliged, on account of the violence of the pain, to grasp the bed-post. I wish you would speak to her." I saw her, she had a yellow discharge, and great pain on making water; but a few doses of aperient medicine soon carried it off.

Now, gentlemen, as to the treatment of gleet, I would observe this, that the medical treatment consists in the exhibition of sweet spirits of nitre, and balsam of copaiba; from two to three drachms of the former, a drachm of the latter in four ounces of camphor mixture, combined with an ounce of mucilage, will form the best mixture I know of; a large spoonful must be taken twice or three times a day.

R. Spirit. æther. nitric. ʒiij.
Balsam. copaib. ʒij.
Mistur. camph. ʒiv.
Mucil. g. acac. ʒij.

Fiat mistura cujus capiat cochleare magnum bis vel ter die.
If this should not succeed, you must give cantharides together with the Chio turpentine made in a pill.

R. Lytt. pulv. gr. $\frac{1}{2}$
Terebinth. Chi. gr. v.
Fiat pilula ter die sumenda.

When the other fails, this is the medicine medical men usually employ. The local treatment consists of the use of bougies and injections; no treatment is so successful as this; every other is inferior to it. A bougie should be passed every other day, according to the irritability of the patient, making use of injection at the same time; there will be no danger of stricture from this, because the bougies will prevent it; this is the plan of treatment you will adopt. Some persons apply to the urethra the unguentum hydrargyri nitratīs; also the unguent. hydrarg. nitric. oxy. which should be diluted; a scruple to an ounce may be employed, and gradually increased to a drachm. The best injection is that with the oxymuriate of mercury; about a quarter of a grain to three ounces of water will be quite sufficient to begin with; it may be increased after a time to two grains to an ounce. If it should not, however, be productive of any good in the proportion of half a grain to an ounce of water, do not use it any stronger, for it is likely to produce considerable irritation; in general, it is an excellent injection. The sulphates of copper and zinc and cuprum ammoniatum have been recommended; each has had its advocates. The plan of treatment which I have laid down is the one I have found the most effectual myself; it is generally certain in its effect, and always safe to employ.

There are two diseases produced from gonorrhoea which may be called gonorrhoeal rheumatism and gonorrhoeal ophthalmia. The first of these affections is not an unfrequent disease. I will give you the history of the first case I ever met with; it made a strong impression on my mind. An American gentleman came to me with a gonorrhoea, and after he had told his story, I smiled, and said to him, do so and so, particularizing the treatment, and that he would soon be better; but the gentleman stopped me, and said,
Not so fast, Sir; a gonorrhoea with me is not to be made so light of, it is no trifle; for in a short time you will find me with inflammation in the eyes, and in a few days after, rheumatism in the joints. I do not say this from the experience of one gonorrhoea only, but from that of two, and on each occasion I was afflicted in the manner I have described. I begged him to be careful to prevent any gonorrhoeal matter coming in contact with the eye, which he said he would. Three days after this, I called on him, and he said, Now you may observe what I told you a day or two ago is true. He had a green shade on, and there was ophthalmia of each eye. I desired him to keep in a dark room, to take active aperients, and apply leeches to the temples, in order to reduce the inflammation. In three days more he sent for me rather earlier than usual for a pain in one of his knees, (the left,) it was stiff and inflamed; I ordered some applications, and soon after the right knee became affected in a similar manner. The ophthalmia was with great difficulty cured, and the rheumatism continued many weeks afterwards. This case struck me very forcibly, and I asked Mr. Cline, with whom I was in the habit of frequently coming in contact, whether he had ever seen rheumatism proceeding from gonorrhoea? and he replied, several times.

The next case did not surprise me so much; and now and then, ever since, I have met with similar ones. It is by no means an unfrequent occurrence for gonorrhoea to produce a rheumatic and painful affection of the joints. Whether it is by absorption of the poison, or the constant irritation produced by the inflammation of the urethra, I do not know; but certain it is, that gonorrhoea produces ophthalmia and rheumatism, and when not a single drop of matter has been applied to the eye*. The inflammation generally attacks both eyes, and is of long duration. It requires the same remedies as are used in gonorrhoea; balsam of copaiba or some form of turpentine will be found the best, and to these you add such local treatment as the state of the inflammation demands.

* I believe it is now generally admitted, that it is the balsam copaibae which produces those painful affections of the joints simulating rheumatism.—A. L.
But with regard to gonorrhœal rheumatism, some form of turpentine must be exhibited; either the spirit of turpentine, the balsam of copaiba, or olibanum. When you have practised a little you will find this to be true. I do not recollect to have met with a description of it in any surgical work, but whoever has practised at all, must have frequently met with it*

Gonorrhœa in females is rather less violent than in males. Its seat is in Cowper's glands, on each side of the urethra at the os externum. On each side of the os externum, there are two small openings, which will admit the head of a probe being introduced into them, and these are the seat of the gonorrhœa in females. There is a great degree of surrounding inflammation; the orifice of the meatus urinarius and the lacunæ discharge matter. There is pain in making water, and in some severe cases, it commonly happens that there is considerable irritation of the bladder, and the shortness of the urethra is the cause of this; the inflammation at the orifice extends down the meatus urinarius to the internal coat of the bladder. In this complaint the meatus urinarius, Cowper's glands, and the extremity of the vagina are red, and the carunculae myrtiformes swollen. I once had an opportunity of examining a woman from Magdalen-ward of this hospital, who died of gonorrhœa; it is the only female with this complaint I have ever opened. In addition to the circumstances I have just mentioned, I found the urethra very red, and red streaks proceeding from the termination of the meatus urinarius to the bladder, and the bladder itself inflamed.

There is a circumstance which I am exceedingly anxious to dwell on, I allude to a discharge from young females, and I hope that there is not one here this evening, but will be strongly impressed with the importance of the subject. Children from one year old, and even under, up to the age of puberty, are frequently the subject of a purulent discharge from the pudendum, chiefly originating beneath the preputium clitoridis; the nymphæ orifice

* When the balsam copaibæ produces those pains resembling rheumatism and ophthalmia, its further continuance is contraindicated.—A. L.
Gonorrhoea of female infants.

of the vagina and the meatus urinarius are in an inflamed state, and pour out a discharge. The bed linen and rest of the clothes are marked by it. It now and then happens to a nervous woman, to be alarmed at such an appearance, and she suspects her child of having acted in an improper manner; and perhaps not quite clear herself, she is more ready to suspect others, and says, Dear me, if she confesses, it is something like what I have had myself. She goes to a medical man, who may unfortunately not be aware of the nature of the complaint I am speaking of, and he says, Good God, your child has got a clap (a laugh). A mistake of this kind, gentlemen, is no laughing matter, and though I am glad to make you smile sometimes, and like to join you in your smiles, I cannot do it on the present occasion, for it is too serious a matter. I can assure you, a multitude of persons have been hanged by such a mistake. I will tell you exactly what takes place in such cases, the mother goes home and says to the child, Who is it that has been playing with you? who has taken you on his knee lately? The child innocently replies no one, mother, nobody has I declare to you. The mother then says, Oh don't tell me such stories, I will flog you if you do, and thus the child is driven to confess what never happened, in order to save herself from being chastised; at last she says such a one has taken me on his lap, the person is questioned, and firmly denies it, but the child owing to the mother's threats persists in what she has said, the man is brought into a court of justice, a surgeon who is ignorant of the nature of the discharge I am now speaking about, gives his evidence, and the man suffers for that which he never committed. The mother is persuaded if there be a slight ulceration on the parts, that violence has been used, and a rape committed. She immediately says, "What a horrid villain must he be for forcing a child to such an unnatural crime, and commun-
ON THE VENEREAL DISEASE.

and asked me to see a child with him, who had a gonorrhoea on her. I went and found that she had a free discharge from the preputium clitoridis. I said that there was nothing so common as this. There was considerable inflammation, and it had even proceeded to ulceration, which I told him would soon give way to the use of the liquor calcis with calomel. "Do you tell me so," he replied, "why suspicion has fallen on one of the servants, but he will not confess. If he had appeared at the Old Bailey, I should have given my evidence against him, for I was not aware of what you have just told me." I told him that if the man had been hanged by his evidence, he would have deserved to be hanged too. I am anxious that this complaint should be known by every one present, and that the remarks which I have made should be circulated throughout the kingdom. When a child has this discharge there is a heat of the parts, slight inflammation, and this sometimes increases and goes on to ulceration. This disease sometimes occurs in children at the time of cutting their teeth. The treatment you adopt is the lime water with calomel applied to the part; and give calomel and rhubarb combined with jalap.

As to the treatment of gonorrhoea in females, you must direct the patient to take diluents; we possess no medicine which has a specific influence over the discharge in females, you must depend on diluents, and appease any local inflammation by the use of such lotions, as the liquor plumbi, dilutus; a sponge dipped in these, should be introduced into the vagina, and be allowed to remain there; it should, however, be often removed and cleaned. It is necessary that the patient should take aperient medicines.

Of gleet in females, I observed, when speaking of gleet in males, that is was doubtful whether the discharge, as long as it continued, ever ceased to be infectious. The same observation applies to females. (The learned professor here related the experiment detailed by Mr. Hunter, in his work on syphilis, shewing the length of time the infection may be propagated by a female, after the appearance of the discharge.)
LECTURE V.

We shall speak in this evening's lecture of chancre.

There are two poisons, as I mentioned to you before, communicated by venereal intercourse; one the poison of gonorrhœa, which falling on a mucous surface, produces from that surface a discharge of matter which is infectious; the other, the poison of syphilis, which applied to the skin, or as far as is known at present, to any surface, produces inflammation and ulceration, forming a sore called chancre; which being received into the glands of the groin occasions bubo; and being conveyed into the system circulates with the blood, produces ulceration on different parts of the body, on the mucous membrane of the throat, the skin, the periosteum and bones.

The time at which the effect of the poison that produces chancre makes its appearance, is uncertain; the chancre, however, generally appears three or four days after connexion, and from four to seven days is the average time. The poison first produces inflammation, then ulceration; the inflammation is attended by a pimple arising from the surface affected, which is like a common pimple, excepting that it is of a deeper colour; instead of being quite florid, it is of a darker hue. The pimple is surrounded by a kind of erysipelatous inflammation; an ulcer forms in the centre, and then a pit forms in the body of the sore, which is often of considerable magnitude, and extends beneath the skin. The surrounding edges of the sore are hard and ragged, its surface is yellow, and the margin red; and if you were asked if a sore was a chancre or not, you would answer, I must feel it first, and not decide merely by looking at it. You would then lift up the part between your fingers, and if you found a hardness beneath, this would be a very good criterion of its being a syphilitic sore; for it is neither in the ulceration, nor in the yellowness of the surface, nor the raggedness of the edges, but in the colour and hardness of the sore that the characteristic marks of the chancre manifest...
themselves; from the presence of these you form an opinion, and are enabled to say positively if the sore be a chancre. But, gentlemen, if you ask me whether it is possible to determine, that a sore on the penis is not chancre, I should tell you that I believe it impossible for any man positively to say that it is not; chancre varies exceedingly in its appearance in different persons; also in the same person under different degrees of irritation, and as it is accompanied by more or less of inflammation; and every one who has seen any thing of practice in his profession, must know that secondary symptoms occasionally appear after sores, which at the time he was led to suppose were not syphilitic. I could say in an instant when a sore had a syphilitic action, but still a sore may not have the character of syphilis, and yet be so.

We shall now trace the varieties of chancre, and the causes which more frequently produce them. The first circumstance which gives rise to variety in the appearance of chancre is,—1st, when the chancre is produced by the application of the venereal virus to a surface that is broken. Now if the poison be applied to a sore or an excoriation, it produces ultimately a syphilitic action, as is witnessed afterwards in bubo and secondary symptoms; but it is a long time before the venereal action is excited, and in these cases you will find that the sore has neither a surrounding hardness, nor a livid colour. When chancre is produced by the application of the virus to an excoriation or laceration, you must be contented by judging of its character from other circumstances; it may have the appearance of being syphilitic, but you must hesitate before you give a positive opinion; it requires time to decide it, and you may say to the patient that there is considerable doubt as to the nature of the sore; it may be simply an excoriation, or, on the other hand, it may be a syphilitic sore; your best plan is, merely to apply simple applications to the part and wait, if it be syphilis, till secondary symptoms appear, when you must have recourse to mercury for the treatment of the complaint. This is one of the varieties caused by the application of the venereal poison to an excoriation or laceration, preventing you from forming an accurate
judgment on the first appearance of the sore. I tell you what I generally inquire of patients under these circumstances, viz. whether they observed the sore on the following day after connexion. If they say "yes," the probability is, that it is not syphilitic, but it is no infallible criterion; therefore treat the sore as you would any other, by common means at first, and wait the issue to see whether it is venereal or not. Another circumstance, producing a variety in the appearance, is its seat.

Chancre situated on the frenum is different to what has been described attacking the other parts; it generally happens that a chancre in this situation rapidly destroys the part, unless mercury be given early; it is more irregular in its appearance than chancres in other parts, and does not assume a character similar to those seated on the glans. If it happens to be on the edge of the prepuce, a good deal of effusion into the cellular membrane takes place, and phymosis is produced; when the sore is situated just where the skin doubles over the penis, it is exceedingly troublesome, there is considerable swelling, also a difficulty in drawing back the skin; in this situation it seldom fails to produce phymosis, from what cause it is scarcely necessary to explain to you, the inflammation leads to an effusion into the cellular tissue, and the result is phymosis. If the chancre be on the corona glandis, or between it and the frenum, you often find it extending deep, and producing sloughing of the part, and even of the glans itself, which is not at all an uncommon result of deep seated chancre at the corona glandis.

The next circumstance which gives rise to a variety in the appearance, is when it ulcerates deeply into the cellular tissue; a chancre on the surface of the skin is very slightly irritable, but if it passes the skin, and extends into the cellular tissue, it assumes a disposition to ulcerate and slough. A chancre on the skin heals under the use of medicines and external applications; but if once it enters beneath the skin and inflames the cellular tissue, it becomes irritable, sloughs, and is attended with danger, the danger arising when the chancre extends beneath the part on
which it began. When the chancre is on the surface of the skin, and does not ulcerate deep, it is a disease slow in its progress, and easy of cure; but if, on the other hand, it extends deep into the part, it proceeds with rapidity, and those acquainted with the disease dread it, as they know the extent of sloughing which will be produced. But, gentlemen, of all the causes of varieties of chancre, one of the most common is the habit and constitution of the patient. If each of you (which God forbid) had a chancre this evening, and you all used the same applications, in four or five days scarcely two of you would have the chancre of the same appearance. Go into the admission rooms of these hospitals on taking-in days, and you will not see two men with chancre alike. The variety is not only produced by the previous mode of living, and the constitutions of the patient, but any act of intemperance, excess of any kind, or any thing that hurries the circulation, will alter the action of the part. So, if two patients be attacked with chancre, the one not of an irritable habit, and the other being very irritable, you will find, in the first, that there would be scarcely any inflammation, whilst in the second it would be violent, and of an erysipelatous character; indeed, under these circumstances, if the part be not very carefully managed, it will be in considerable danger. So, a man with chancre to-day, which has a healthy appearance, shall to-night indulge in some act of debauchery, to-morrow he will have a bloody discharge from the sore, inflammation round the edges, and an irritable state of the parts, which you will soon find assuming a sloughing disposition. Thus, then, if the constitution be irritable naturally, from intemperate habits, or inattention to rest, the most serious state of chancre may arise. People pursuing a particular business, such as journeymen bakers, whose habits are of the most irregular kind, are frequently affected with chancre going into the sloughing process. See, for instance, how these people pass their lives, kneading dough during the greater part of the night, lying down only during short intervals to rest, frequently staying up all the night without any repose, and if they rest at all, only for a few hours to-
wards morning, and thus rendering their constitutions excessively irritable. When the chancre proceeds to a sloughing state, from any of the causes I have mentioned, the pulse will be generally from 120 to 130; you will also find a considerable erysipelasous inflammation extending round the chancre, and in a short time the sloughing process commences, by which the penis is lost. These varieties of chancre you have an opportunity every week of seeing for yourselves; and if you have not observed them, it shews a shameful neglect of your duty. The time at which chancre appears after connexion, is from four to seven days; but if there is a gonorrhoea also, it prevents the appearance of the chancre so early,—thus, if a person be affected with the two poisons, the one delays the appearance of the other. If the matter of a chancre be applied to the urethra, it will not produce a gonorrhœal discharge, but a sore; and that sore will pour out a serous fluid, mixed with the red particles of blood,—not at all purulent, but a bloody serum,—which is the matter from the chancre, and not in any respect gonorrhœal. The matter of gonorrhœa does not produce chancre, for if leeches be applied to the prepuce, and the gonorrhœal matter afterwards comes in contact with the leech-bites, a sore is produced, not of a chancrous character, and it heals by common means. The poison of chancre will not produce a gonorrhœa, nor the poison of a gonorrhœa induce a chancre.

Having thus endeavoured to explain the character of chancre, I shall now speak of the treatment it requires; and here let me remind you that I shall deliver no speculative opinions, nothing but what you may see every day exemplified in practice. The first point to be considered respecting the cure of chancre is, shall caustic be applied to it or not? He who uses caustic to chancre pursues a line of practice liable to be productive of much mischief. First, because the application irritates the part, and may in consequence produce bubo. 2d. If the action of the sore be altered by it, it will not prevent the constitution from being affected, because, if there be any ulceration, the process of ab-
sorption must have commenced, and the poison applied to the part will be taken into the constitution. I would ask the person who uses caustic for the cure of chancrees, how is chancre produced? We know that there can be no sore without the ulcerative or absorbent process, and the chancerous matter applied to a part, causing a sore in that part, must be absorbed and taken into the system. Caustic to chancrees is a very objectionable application; but it is the acme of folly to endeavour to cure a patient by means of it, without adopting a proper mercurial treatment to counteract the constitutional effects that will otherwise be produced by the absorption of the venereal virus. A young person with whom I was intimate whilst I lived with my old master, got a chancre which, to use his expression, he burned out by the application of caustic; I laughed at him for being so foolish; the caustic produced a slough, and cured the chancre, and I thought nothing more of the circumstance. Some time afterwards I visited him in the country, and I asked him how he was? "Very well now," he replied, "but I have been in a fine scrape; I was engaged, when I left town, to a young lady, the nuptials were to have been soon celebrated, and the business of life commenced." I involuntarily smiled, but he said, "Not quite so merry; when I got into the country I had what I conceived at the time was only a huskiness of the throat, which I had caught from a cold. My throat becoming more painful, I looked into the glass, and perceived that I had a large sore on the tonsils, decidedly syphilitic. You may conceive how I felt; I wrote to the lady that I was unwell, who, exceedingly hurt at such news, came and nursed me whilst I underwent a course of mercurial treatment, (she being perfectly unconscious of the cause of my complaint,) by which means I was quite restored, when the marriage ceremony was celebrated."* It was just a proper punishment for his folly. The application of caustic to a chancre does not render a person safe from its effects; for if the sore be a chancre, the syphilitic virus must have been admitted into the constitution. I will tell you

* The error was, in not using constitutional means, not the employment of caustic.—A. L.
what treatment you should pursue: as soon as a patient applies to you for this complaint, you should ask him if he wishes to be properly cured at once by a simple mercurial treatment, or have the chancre cured without it, and run the risk of having secondary symptoms occurring at a future period. His answer will be, "For God's sake, give me what is proper now for my cure, without submitting me to the chance of being laid up a second time with this complaint;" and you then order him to take five grains of blue pill and a quarter of a grain of opium night and morning; if you exceed this quantity, let him take an additional pill at bed time. Now, gentlemen, this medicine continued for three weeks will be quite sufficient for the cure of the disease. It may be asked, why do you combine opium with the mercury? If you were not to do it, the result would be, that the mercury by itself would irritate the chancre; but if the mercury be combined with opium, it rarely produces this effect; the way therefore to prevent irritation and a sloughing state of the chancre, is to give the mercury in conjunction with opium. The patient will ask you how he should live whilst he is undergoing this treatment; you may tell him that he may follow his business or occupation just the same as before; that he should not take any species of food which is likely to disorder his bowels, as it is desirable to prevent the mercury acting on the intestinal canal; but his mode of living should be as usual; he should avoid acids, because they would purge him, and for this reason he should not take vegetables which contain much acescent matter; there is no necessity for him to change his food. Two or three glasses of wine a day would not prevent the action of the mercury; taken so as to hurry the circulation will oppose it, but if taken moderately it will do no harm. With respect to the quantity of mercury given, the treatment of the syphilitic disease is greatly improved, for all that you want is just to keep up the mercurial action on the constitution for a short time, instead of making the patient spit at the mouth for weeks and months, as used to be done. One point has also been ascertained, that chancre for which no mercury has been taken, are not always followed by secondary symptoms.
With the exception that less quantities of mercury are given, I should say that within the last twenty-five years the treatment of the venereal disease has gone back rather than improved; secondary symptoms are now more frequently met with than formerly, owing to the neglect of a mercurial treatment on the first appearance of the complaint. A person hardly knows now when he is cured; a half practice has been substituted for one that was perfectly efficient, and the result is that at present a person is scarcely ever cured. Day after day we see persons with pains in their limbs, sores on their body, and affections of the throat, and do not know whether they are syphilitic or not. You ask the patient if he has had chancres; says he, No. Have you had no sore nor excoriation? you then inquire; when he will often tell you, yes, I had several excoriations; and thus you do not know whether the eruption is syphilitic or not; but more of this when speaking of the use and abuse of mercury.

The local application I make use of is the liquor calcis with calomel; and I will tell you why I always make use of local means. The local application lessens the irritation of the sore, and prevents its attacking the neighbouring parts. If any of you had chancre, in addition to the local means you would, if the sore healed, continue taking medicine; do not think, because the sore is healed that you must stop the mercury; no, it must be continued during the time I have mentioned before. To prevent the recurrence of secondary symptoms, it will be proper to heal the sore as quickly as you can, but you must protect the constitution against the effects of the venereal virus by mercurial treatment; this is the best possible treatment, and which you will pursue if you deal honestly with your patient. If you wish to see the effect of any new project, or try any experiment, this is all well, but you should try them on yourselves. If patients, however, come to you for advice, they place themselves under your care, and confide in your skill; therefore it is the duty of every surgeon to adopt the most certain and effectual means for their relief. With respect to local applications, I think the sulphate of copper too irritating; sub-
muriate of mercury sprinkled on the sore is sometimes beneficial, but it is generally too irritating also. The Unguentum Hydrargyri Nitrici Oxydi I have seen of considerable use after a time, but it should not be applied at the beginning of the complaint. The Unguentum Hydrargyri is a bad application, it is too irritating. Sometimes it appears that the chancre goes into an indolent state, then it will be advisable to use the nitrate of silver, not with a view to destroy the part, but for the purpose of cleaning the surface, and thickening the edges of the wound; the skin surrounding the part is thin, and by the application of the nitrate of silver you thicken it, and thus enable it to carry a greater number of vessels to produce cicatization.

It not unfrequently happens that phymosis is the result of chancre. It is hardly necessary for me to say what phymosis is; it sometimes arises from slight inflammation of the cellular tissue, and effusion of serous matter into it. Here I will observe that, should you find, during a mercurial treatment, considerable inflammation produced round the chancre, lay aside the use of mercury. The great secret, in the treatment of this disease, is knowing when to discontinue the use of mercury; you should always suspend it when the inflammation is increased during its employment; for if you persevere in the use of mercury, you will only add to the irritation, which will end in a sloughing process and destruction of the part. If I were to give to a patient mercury for chancre on the Saturday, and on the Monday following I perceived swelling and inflammation round the sore, I should immediately lay aside the mercury, give active purges, order poppy fomentations, and the part to be suspended. The black wash should be applied to the sore, injecting it under the skin, unless it should increase the irritability of the part. After the purges, administer opium in considerable quantities, and when you have reduced the inflammation, have recourse to the mercury again; but if you had gone on with this medicine in the irritable state of the part, the result would be sloughing of the penis. When there is phymosis, together with sloughing, of the penis,
stop the mercury, order the patient the recumbent posture, and the part to be well supported, use fomentations and poultices of a slightly stimulating kind: you support a gently stimulating action in the part, in order to produce a secretion sufficient to support the powers of the part; if you stimulate it too much, the part will be destroyed; and if you omit to do it in a slight degree, there will be no separation of the slough. The poultices we generally employ are made with stale beer grounds; carrot poultice is stimulating to the part; this poultice stimulates rather too much, unless the carrots have been boiled for a long time. The medicines we give are musk and ammonia, five grains of the ammonia with ten of musk two or three times a day. The nitric acid lotion is a common application used in these hospitals, and we find none produce so much good; the proportions are about forty drops of undiluted acid to a quart of water.

When phymosis remains after the inflammatory state has passed away, it will be necessary to perform an operation for its cure. The operation is exceedingly simple; it consists in introducing a director beneath the skin along the glans till it reaches the corona glandis; this is the extent to which it should be introduced, so that the point should rest against the inside of the prepuce; this being done, a sharp-pointed bistoury is to be passed along the director to its extremity, then pushed through the skin opposite to the corona glandis, and drawn out. But when you have done this, you will find that the internal part of the prepuce is not divided as much as the external, which you are obliged to divide a second time. The next thing you do is to apply a piece of lint round the prepuce, which is to be supported on the penis by tape; a roller should be applied so as to make gentle pressure, for the purpose of preventing a secretion from the blood-vessels. You let the patient remain as long as he can without making water, in order not to disturb the dressings. When you see him on the following day, you soak the penis in warm water, remove the lint, and draw the prepuce gently over the glans. This you should do daily, taking care that the edges of the divided surfaces do not unite. When the part is
quite healed, a small aperture only is left in the upper part of the prepuce, which is of very trifling importance.

LECTURE VI.

We spoke, gentlemen, at the conclusion of the last lecture, of phymosis*, we shall now proceed to paraphymosis†.

Paraphymosis is not an uncommon consequence of chancre. When there is tightness of the prepuce from inflammation, it frequently happens that after the skin has been pulled back, it cannot again be drawn over the penis, on account of the skin of the prepuce forming a tight ligature round the penis, just beyond the corona glandis, strangulating it in the same way as the intestine is in hernia. The object in your treatment should be to reduce the strangulated part as quickly as possible, all other means are improper; the application of cold is absurd, you merely lose time by employing it—it is a vain and useless mode of procedure. The proper plan for you to pursue is this: you see the penis greatly distended with blood; therefore take hold of the glans between your fingers, and endeavour to empty the vessels by means of gentle pressure. When you have done this for a few minutes, you endeavour to reduce it by pushing the glans back, and at the same time taking hold of the skin of the penis and drawing it forwards. By this plan will you generally succeed, if you see the case a short time after it has happened; but if the paraphymosis has existed for some days, it will be wrong to attempt reduction by pressure on the glans. You should then divide the stricture with a bistoury. This you do by separating the skin on each side as much as you can from the stricture; you then insert a director under it, and with a sharp-pointed bistoury divide the

* Phymosis.—When the fore-skin cannot be reflected backwards over the head of the penis.—A. L.
† Paraphymosis.—When the fore-skin cannot be brought over the head of the penis.—A. L.
stricture, which will allow the skin readily to be drawn over the penis. After the paraphymosis has been reduced, poultices must be applied to the part. It is sometimes necessary to remove a portion of the prepuce by circumcision: in cases of phymosis, where the prepuce is naturally long, and only a small division of the skin is required to allow it being drawn back; this operation is preferable to the one which I before described.

Having spoken of the common consequences of chancre, I shall now treat of the irritable and sloughing chancre.

Every now and then a chancre becomes irritable from causes already pointed out. When you see a chancre assume an irritable character, desist from the use of mercury. To know when to stop the mercury, is the great secret in the treatment of the venereal disease. It is in consequence of mercury being given in this state to the patient that it does so much harm, producing those sloughing chancres that not unfrequently destroy life. Thus, when a sore becomes irritable under the use of mercury, and the inflammation extends, lay it aside and have recourse to simple applications, such as poppy fomentations and poultices, to lessen the irritation. After you have purged the patient, give opium combined with saline mixture; as good a medicine as you can employ under these circumstances is the liquor ammoniae acetatis. In this way you will diminish the irritation; and when the surrounding inflammation is got rid of, return to the mercury, taking care to discontinue it if the irritability should return.—Some advise the compound decoction of sarsaparilla, and I believe that it has the power of diminishing to a considerable degree the irritability of constitution from which many persons suffer during an attack of syphilis; with this view give it by all means; but as to its curing syphilis, I do not believe a word of it. You may suspend the syphilitic symptoms for a time, but they will soon reappear, and a person who trusts to this alone will be a martyr to a disease, which might have been easily cured. But more of this when making some general remarks on syphilis. If a person with irritable chancre, be guilty of intemperance, addict himself to any...
Treatment of irritable chancre.

excess, or be careless of his health, the sore will slough, and often end in the destruction of the penis. Do not think that it is a rare occurrence for the penis to be destroyed by syphilis; no, a chancre that has remained weeks in a healthy state shall become irritable, and by maltreatment, by the injudicious and improper use of mercury, shall slough, and end in the destruction of the penis; this is not a rare case, and is attributed to the venereal disease, which is an effect of the injudicious use of mercury. This is a true history of the case. When you see a sore take on the sloughing appearance, the treatment must be changed, the employment of mercury suspended: gently stimulate the part by the nitric acid lotion; there is no better application in this stage of the disease than this, and those who have attended to the practice of the hospital need not be told of this by me. From 30 to 50 drops of acid to a quart of water is the proportion in which you should use the acid. Fomentations and poultices must sometimes be employed, but in general they are not good, as they soften and weaken the parts rather too much; heat and moisture do not agree in these cases. Warm spirits of turpentine may sometimes be employed with benefit. You will be obliged to have recourse to a great number of applications, and frequently to change them before any relief can be obtained. We had a girl in Lydia's ward of St. Thomas's hospital, who had sloughing of the pudendum; seventeen or eighteen different applications were employed, but the same application seldom agreed with the sore for five days in succession, it was obliged to be changed, and some other used—the girl however ultimately recovered. If the patient be very irritable, opium and the compound decoction of sarsaparilla should be exhibited; in this way you will diminish the irritability of the part. When the sloughing extends, the ammonia combined with opium will be found of considerable benefit; five grains of ammonia and one grain of opium three times a day. We are in the habit of giving in these hospitals ammonia and musk, ten grains of musk and five grains of ammonia three times a day in the form of a bolus, and on the whole we
find that they exercise a considerable influence in sloughing chancre. At the same time, you must support the patient’s strength by a nutritious diet, and give stimulants to assist the digestive powers, and the power of the circulation; wine and porter must be allowed; porter, if the patient be of an irritable constitution, and if not, wine; they must be given so as to keep up a vigorous action, but not to excite a feverish heat. By these means you will generally put a stop to the sloughing, and establish the patient’s health. If the chancre slough early, you should not make use of mercury immediately after the healing process has taken place, but wait for the secondary symptoms. If the sloughing come on early, the patient will be safer from future attacks, and I therefore generally wait to see the result.

It occasionally happens that an opening in the urethra is formed to a considerable extent. When there is an opening, there are three plans of treatment to be adopted:—1st. If the opening be small, a bougie should be passed until you have established a considerable diameter of the urethra, just anterior to the opening, to allow the water to pass freely, when the aperture will soon close. 2dly. If the opening be large, caustic should be applied round the edges of the aperture, a little nitric acid will do, which produces a slough of the cuticle and cutis; when the healing process commences, it should be continued once a week until a cicatrix form and draw the parts together, and entirely cure the patient. 3dly. The next mode adopted, is the Taliacotian operation; it consists in bringing a piece of the living skin over the aperture. Some pare the edges of the opening and apply the twisted suture, but it never succeeds, as the urine soon bursts it open; but the other operation has been performed with success. I had a patient once with this complaint, in whom I separated a small piece of skin from the scrotum, and applied its raw surface to the edges of the wound; this I kept in its situation by three sutures. Adhesive plaster was put over the whole, and a gum elastic catheter kept in the urethra.—This case completely succeeded. Mr. Earle has since performed an operation on a
similar principle and with perfect success. I think it an operation which you ought to perform; it may be done in any part of the urethra.

These are the modes of treatment in the sloughing urethra. If there be a cicatrix at the mouth of the urethra, or the orifice be small, you cannot cure such a stricture in the usual mode. You must cut off a piece of bougie, and regularly wear it in the urethra, withdrawing it twice or thrice in the course of the day to allow the urine to pass off. The object is to excite a suppurative inflammation, and thus remove the stricture. For when the suppurative inflammation has been excited, the urethra has not the same disposition to contract as before. Sometimes the extremity of the urethra is closed; after making water in a stream about the size of a bristle, the opening suddenly closes, and the patient cannot make a drop. If called to such a case, what you do is not to open the bladder, but you put the point of a lancet into the glans, just at the commencement of the urethra. The urine gushes out by the side of the lancet, and then a bougie must be inserted to keep the orifice open. Such is the treatment of obstruction of the urethra at its end.

Chancres in women are often worse than in men. They attack the external labia, not unfrequently the inside of the nymphæ and the os externum vaginae. Sometimes a great number of these exist at the same time in one female, and are accompanied with but little irritation; she scarcely knows that she has them, till she feels the urine smart as it touches the skin; this engages her attention, when she perceives that she has several pimples, which soon ulcerate. If this occur in a bad constitution, and extend into the cellular tissue, inflammation and sloughing of the part take place. Sometimes the labia and nymphæ slough away, and in this way it is so many lose their lives. I visited one day the St. Giles's workhouse, and in a small ward belonging to the medical establishment, I saw seven cases of sloughing chancre, and of these seven, five died. It is almost impossible for them to recover when there is such a destruction of parts. If you in-
quire into the history of the case, you find that it first began by a few pimples; the unfortunate female will also tell you that she continued to walk the streets, night after night, exposed to the vicissitudes of temperature,—that she indulged in the use of spirituous liquors, in order to support her declining strength; the disease thus occurring in a constitution destroyed by irregularity of habits, the patient often has but a slight chance of recovery. If one of these miserable cases could be but depicted from the pulpit as an illustration of the evil effects of a vicious and intemperate course of life, it would, I think, strike the mind with more terror, than all the preaching in the world. The irritable state of the patient in which the disease occurs, leads to the destruction of life, and thus it is that such a great number perish. If I said that I saw twenty of these cases in a year I should not exaggerate. Neglected chancres, and injured constitutions, lead to this most frightful disease. The treatment is the same as for males.

Warts were formerly considered as syphilitic, but you are to learn that they are nothing but a local disease, requiring nothing but local means for their cure. Yet, when I say local, I must observe, that they frequently secrete a matter, which is able to produce a similar disease in others; I have known two instances of this. The one occurred in a Mr. Guller, dresser to Mr. Chandler. Mr. Chandler removed some warts which were of a very large size, from a patient in this hospital, and as he was returning the knife, this gentleman put his hand forwards, and it entered just under the thumb nail. He left town for the south-western part of England; in a little time he had an irritation about the nail, and a wart grew out from the spot where the puncture had been made. Being in practice, this was a very disagreeable circumstance; it was frequently destroyed, but at each time it grew again. Afterwards he came to town, when he called on me and told me the circumstances. I advised him to put on a blister for the purpose of bringing away the nail, and then that the wart might be removed. He applied a blister, and readily removed the nail,
but it also brought away the wart, and it never grew again. The
other case of warts generating themselves was told me by a
gentleman in Sussex. He was called to attend a lady in labour;
he felt something in the vagina which appeared unintelligible, and
on examination found it to be a crop of warts. He delivered her,
but did not say anything about the warts to the lady. In con-
versation with the husband, he told him that his lady had a number
of warts. The gentleman then stated that at the time he was
married, he had a wart on the penis, and he had no doubt but that
he communicated them to his wife. It is a common opinion, that
they are propagated by the blood; but do not entertain this
idea, it is by the secretion of matter. Simple local irritation will
produce warts. The secretion from the glandulæ odoriferæ, if not
cleaned will give rise to them, or any dirt between the penis and
glans. The treatment is different as the warts may be hard or soft.
Soft warts readily bleed, and may be easily removed. The liquor
plumbi subacetatis dilutus, applied to the surface of them, will
remove the soft warts. The oxymuriate hydrargyri will soon
destroy them. I have used the tinctura ferri muriatis, and the
black wash and calomel with good effect. The unguentum hy-
drargyri fortius destroys them, by producing irritation, inflamma-
tion, and a sloughing of the warts. The hard warts are more
difficult to remove; they had better be poulticed first, and then
touched with the unguentum arsenicale, which should contain a
dram of the oxide of arsenic to an ounce of lard. A few of the
warts should be touched with this application in the beginning,
and afterwards the whole. It produces inflammation and slough-
ing of the warts. I scarcely ever use anything else myself.
Warts sometimes occur in females on the labia and nymphae of a
size that you would scarcely credit it.

* Let the warts be anointed with a small portion of the Unguentum
Hydrargyri Iodidi, care being taken to protect the surrounding parts, and
a few applications will remove them.—A. L.
LECTURE VII.

Gentlemen, we shall proceed to speak this evening of syphilitic bubo, and venereal sore throat.

The venereal poison is taken from the chancre on the penis, to the glands of the groin, and in its course, usually irritates one of them. Now and then, the matter proceeds through them without producing any irritation, but more frequently it excites inflammation, and the common effects of inflammation, if it be not opposed, that is, if a proper treatment be not pursued, the gland inflames and suppurates*. It commonly happens that only one gland is affected in either groin in syphilis; now and then the contrary takes place, but in general, when several glands are enlarged, it is from irritation, and not the absorption of the venereal poison. When there is only one gland enlarged and it goes into a suppurating state, it is usually the consequence of the stimulus of the syphilitic virus. Therefore you may conclude, if several glands be enlarged, that it is not the effect of syphilis. The symptoms produced when a bubo goes into a state of suppuration, are the same as those which take place in common abscess, with this exception, that there are evening exacerbations; and in this respect, precisely the same effect is produced as when syphilis attacks any other part of the body, the exacerbations coming on in the afternoon, and generally lasting till two or three in the morning. The symptoms then are the same as those of common abscess, with the exception of evening exacerbations. When you are consulted about a bubo, you are led to suspect that it is venereal by the following circumstances. You ask the patient if he has a sore on the penis; if there be none, and he has never had one, your opinion ought to be that the bubo is not syphilitic. There is no example of venereal bubo ever having occurred without a sore. If there

* I have never seen a bubo suppurate since I commenced applying the dry nitrate of silver freely over the whole of its surface every second or third day: even when matter had formed, it has been absorbed.—A. L.
be no sore at the time you see the patient, you inquire how long it is since he has had one? If he answers a week, fortnight, or even three weeks ago, still the swelling may be syphilitic; it is not at all necessary for the sore to exist at the time the bubo appears, for the irritation of the gland may occur a fortnight or three weeks after the appearance of the sore. The swelling may be retarded from various circumstances; if the patient have a diarrhoea on him, or have taken opening medicine, these and many other causes may delay its appearance. The next circumstance to which you direct your attention is, whether the enlarged gland be situated at Poupart's ligament, or below it; you know that there are two orders or rows of absorbent glands in the groin. The first row is in the line of Poupart's ligament, extending nearly from the spinous process of the ilium to the pubis, but below this is another tier situated at the distance of an inch and a half or two inches from the first. If the swelling be in a line with Poupart's ligament, you may decide that it is a syphilitic bubo, but you may determine that it is not syphilitic, if it be in the lower order. When you see a swelling in the groin, about an inch and a half below Poupart's ligament, you inquire if there be any sore on the foot or leg, or any irritation on the back or nates, for in such cases the glands are generally affected. The lower order of glands are more frequently affected from any irritation on the thigh and leg than on the back or nates, because the greater number of the absorbents from these last parts terminate in the upper row of absorbent glands. You may determine that it is not syphilitic, if the swelling be in the lower row of the glands.

When you are called on to treat a syphilitic bubo, you order the patient to take five grains of blue pill combined with a quarter of a grain of opium night and morning, with the same view as you give it in chancre; the opium subdues the disposition to an irritable action being set up in the constitution by the mercury, and when it is given in conjunction with the blue pill, you seldom have those dire effects from the syphilitic disease as when the mercury is given alone. Therefore you ought to give the blue pill combined with opium. If you find the pain
in the evening not subdued, you may give ten grains of the blue pill at night and five in the morning. But at the same time that you employ constitutional remedies, local means should not be neglected; evaporating lotions should be applied to the part, a bandage should be put round the waist, and a linen wetted with a lotion composed of an ounce of spirits of wine, to five ounces of water, should be kept to the swelling, and fastened by tape to the bandage. But, gentlemen, it sometimes happens, notwithstanding the means that you employ, the pain, swelling, and the disposition of the gland to suppurate increase; this will be known by sharp pains darting through the part, and a pulsating feel in it, for when these occur, the suppurative process has generally commenced; you then apply evaporating lotion and leeches, give active purges, and omit the blue pill, or else you will make the bubo suppurate. Mercury (as you know) has the effect of hastening common inflammation when it occurs in any part of the body to suppuration, therefore it is wrong when any inflammatory disposition exists in the bubo to continue the mercury, for you will most probably induce suppuration, when you might have prevented it. Under these circumstances it is right to employ lotions and leeches, and purge the patient. The best purges you can give are the mercurial, the submuriate of mercury combined with jalap. By this plan of treatment you can get rid of the disposition to inflammation, whereas if you continue the mercury you will hurry the bubo into a suppurative process. When the pain in the part is subdued, you must return to the first treatment, which will correct the venereal action. It may be said in opposition to this, that you give mercury to prevent inflammation of the eye as in iritis; this is true, but it is not desirable even in that complaint to affect the mouth to any degree; it is not that state of mercurial influence which will cure the eye, for the mercury should be suspended when the mouth becomes affected; it is by increasing the secretion that the benign influence of the mercury is exercised. It sometimes happens that the bubo attains a considerable magnitude; when this is the case, you must give up the use of mercury; never continue it when the bubo is large, it will only hurry

Treatment of bubo.
it into a suppurative process; therefore suspend the use of mercury, and endeavour to lessen the size of the swelling and the inflammation by lotions, leeches, and acting on the bowels, in order to promote the secretions, for this should be your grand object in all these cases; take care at the same time to give that kind of nourishment which will best support the system, without producing any undue excitement. When a gland becomes of considerable size, it is usually the result of debility, and is very apt to become chronic. You should by all means discontinue the mercury, apply leeches, and you may gently stimulate the gland, so as to promote its absorption; for this purpose the application of muriate of ammonia will be of use, at the same time giving purgative medicines. But in this enlarged state of the gland, although it begins in syphilis, mercury greatly debilitates the constitution. When suppuration has commenced, and matter can be felt fluctuating, it is quite right to make an opening to let it out. The opening should be small, and ought to be made as soon as any pus can be felt, for absorption will begin, and the size of the gland will soon be diminished: therefore make an opening to evacuate the matter as early as you can detect fluctuation. My own opinion is, that when the suppurative process has commenced, the best plan is to open the swelling, which I always do by puncturing it with a lancet wherever the matter is formed; it is of no use to let it accumulate, for absorption of the surrounding parts will take place, and a large sore be formed. If the gland be opened as early as you can detect fluctuation, the surrounding swelling will be lessened, the inflammation diminished, absorption rapidly produced, and then you can return to mercury for effecting the cure.

It sometimes happens that the bubo is exceedingly irritable; wherever you find it so under the use of mercury, immediately discontinue its use, for the more mercury you give, the worse the swelling becomes; abandon the mercury, and have recourse to other means; it is right in these cases to give opium and the compound decoction of sarsaparilla, that is the plan you will find the best in irritable buboes. When the state of the swelling will allow, you can return to the use of mercury to complete the cure.
It is only by the injudicious use of mercury that the very severe symptoms which occur after syphilis are produced. I do not believe that syphilis itself ever produces them; no, gentlemen, they arise either from a defect in the constitution of the patient, or from the fault of the medical man. I do not believe that nodes ever arise from the syphilitic virus alone, but principally from the injudicious treatment of syphilis, where mercury has been incautiously administered, thereby increasing the irritability of the patient, and leading to worse consequences than the disease for which it was originally given. In order to subdue this irritable state of constitution, give opium and the compound decoction of sarsaparilla, which have the power of lessening the irritability of the system, and relieving the patient. As to sarsaparilla being a specific for the cure of syphilis, you will find that it is no such thing; it has the power of suspending the symptoms of syphilis for a short time, but not that of curing them, and the surgeon who thinks that it has, grossly deceives himself and those who are the dupes of his ignorance. If he fancies that the patient is cured because the symptoms disappear and the patient does not return, he equally deceives himself; for if he does not return to the same surgeon, (which he seldom does when he has been once deceived by him,) he goes to another, and so on, till at last it is difficult to ascertain whether his disease be from syphilis, or from the various remedies which he has tried. What I should say is, that the improper use of mercury leaves a disposition in the constitution for the disease to return; and whoever has seen much practice knows, that secondary symptoms are generally the result of a mistaken treatment of the syphilitic disease. Well, then, opium, and the compound decoction of sarsaparilla, will lessen the irritability of the constitution; and so far they are useful, but any farther than this they ought not to be trusted. I say that no surgeon who understood the nature of syphilis, and who had it in his own person, would trust to sarsaparilla for a cure. In fact, I would say if he did, (and you know that I use no milk and water expressions,) that he was a blockhead. So long as I have the
honour of addressing you, will I openly state my opinions to you. I am not come here to listen to the opinions of others, which I know to be wrong from the experience of forty years' practice, nor to be taught by beardless boys how to treat a disease, of which I have seen thousands and thousands of instances.

Sloughing bubo. The next subject which we shall consider is the sloughing bubo. If mercury be continued whilst the bubo is suppurating, as soon as ulceration takes place the sloughing process will follow, and extend over a considerable portion of the cellular tissue. Destruction of life in these cases is caused in two modes. There are many specimens in the hospital, taken from persons who died of sloughing bubo. In one, the femoral artery, vein, and sartorius muscle are laid bare to a considerable extent. The one died from the irritation produced by the sloughing process; the other from hemorrhage, caused by ulceration of the femoral artery. Thus destruction takes place from two causes—from the extent of the sloughing process, and hemorrhage from the opening of the femoral artery. A person with sloughing bubo died in the hospital, about three years ago, from hemorrhage. In these cases, you generally see that there is something faulty in the constitution, or that the patient has been injudiciously treated; as to the treatment of sloughing bubo, it is the same as in sloughing chancre.

Abandonment of mercury—exhibition of ammonia with opium—and a generous diet, so as to give vigour to the constitution without exciting any febrile action, that is the constitutional plan of treatment which you should employ; and the local treatment principally consists in the application of the nitric acid wash, about fifty drops of the acid to a quart of water. It sometimes happens when the gland suppurates and the sloughing process is going on, that secondary symptoms appear; it is not right to give mercury in consequence of their appearance, but you order the patient to take the compound decoction of sarsaparilla. When the sloughing process is stopped, and the wound is well, give mercury if the secondary symptoms remain; then, and not till then, ought you to attempt the cure of the disease by the exhibi-
tion of mercury. When the sloughing process stops, and there are no secondary symptoms, do not give mercury. It is never right to employ it as it were by speculation, it will not destroy the venereal virus, although it is not in action, and will not prevent the appearance of the disease. Mr. Hunter was the first who pointed this out, that syphilis could not be prevented from appearing by the exhibition of mercury; and most surgeons state that it is best not to give mercury in expectation of the appearance of the disease, but to wait till it does appear. I give you this rather as Mr. Hunter's opinion than my own; there are some points connected with this subject, which I shall speak of when making some general remarks on syphilis. It occasionally happens that when a bubo suppurates, a sinus remains after the other part is healed. This may be often cured by an injection of about two grains of oxymuriate of mercury to an ounce of water, or the undiluted tincture of lyttae, which will generally bring on adhesive inflammation. If these should not succeed, you must depend on the use of a seton, or laying the sinus open, but this latter mode is very rarely adopted. It sometimes happens that a gland projects after ulceration has taken place; when a case like this occurs, when the gland is insulated and rises above the surrounding surface, you get rid of it by means of small troches made of bread and oxymuriate of mercury, pointed at the extremity, which are inserted into the gland, and allowed to remain there twenty-four hours; this generally brings on a little inflammation, the death of the gland, and its separation from the surrounding parts. I have known the sulphate of copper produce the same effect, but the first is generally the best. When a number of absorbent glands are enlarged, never consider the complaint as syphilitic: they are owing to a defect of the constitution, and never to syphilis. After a bubo has suppurated and ulcerated, it now and then assumes the character of what is called a phagedenic ulcer. If consulted about the nature and treatment of this kind of ulcer, what would you say? First, that phagedenic bubo is an ulcer with the edges thin, rugged, loose, and irregular, owing to a morbid condition of the cellular membrane beneath, which is in a sloughing state; you see in a phagedenic bubo, if you look atten-
Phagedenic ulcer.

tively, that the cellular membrane under the skin is in a sloughing state. There is an increased number of blood vessels, over which the skin hangs loosely, and the ragged edges of the sore are owing to a want of action in the part, the blood being retained in it on account of there not being sufficient freedom to carry it into the system. This kind of sore arises then from the cellular tissue, and it is difficult to give life to it, because it becomes considerably excavated and the skin hangs loosely over it. The best treatment that you can employ is a saturated solution of the nitrate of silver; dossils of lint wetted with this lotion should be daily applied to the surface and edges of the wound, and the liquor calcis or lime water should also be used. Oil-silk should be put over the wound to prevent it getting dry; for if it becomes dry, there is great danger of the gangrene spreading, therefore the part should be kept wet, and this you do by covering it with the oil-silk to prevent evaporation. This then is the treatment of a phagedenic ulcer. Mr. Welbank, a surgeon in Chancery Lane, has recommended the application of the nitric acid in an undiluted state, with the view of forming a new surface. This gentleman has tried it with advantage, at the same time preserving the constitution by restoring the secretions, and supporting the patient by a most nutritious diet. You should give bark and ammonia in combination with the opium, and do all that you can to restore the secretions, for this ought to be the first principle of your treatment.

The venereal poison, when it passes the absorbent glands in the groin, goes into the system, but in its course affects no other glands but these; it is carried through the thoracic duct to the blood, and when in the blood it does not appear to affect but three parts of the body. 1st. The mucous membrane of the throat and nose. 2d. The skin, or surface of the body. 3d. The periosteum and bones. These three are the only parts liable to the syphilitic action after the venereal virus has entered the blood; and with respect to the organs essential to life, these are not capable of having a syphilitic action excited in them; only in those parts of the body subjected to the influence of external causes, is the syphilitic action observed—the internal organs are entirely free from it; the brain,
the viscera of the chest, and abdomen are never affected by it—
even the mucous membrane of the interior of the body is not
affected by it.

I will now describe to you the appearances and consequences
of the disease of the throat. When the syphilitic action is set
up in the mouth, either the mucous membrane of the floor of
the nose, or the roof of the mouth, becomes red and inflamed,
and a pimple forms on it; when this opens, the bony palate is
exposed, which may be easily felt by applying a probe to the
part; this is the manner in which the disease first shews itself.
The exposed bone exfoliates, a communication is set up through
the mouth and nose, fluids return through it, and the voice be-
comes nasal. In this disastrous state, the unhappy patient is un-
fitted for society; with an aperture in the roof of the mouth, he
has a discharge from it of a most offensive smell *, to which the
smell of the dissecting room is not to be compared; for I can
assure you, it is with difficulty that I can bear the breath of a per-
son with disease of the mouth or nose; but independently of this,
he is stamped by a nasal voice, and the fluids which he takes re-
turn through the communication set up between the mouth and
nose. It is a state, gentleman, to which death is far preferable;
therefore, don't look on syphilis as a trifling disease. The tonsil
glands become affected with sores which have exactly the character
of chancre, having rugged edges, a yellow surface, and a livid
colour in the surrounding part. A sense of dryness is felt in the
throat, which spreads up the eustachian tubes to the ear. But
still worse effects of the disease are seen on the pharynx, just op-
posite to the mouth; it is not unfrequently that ulceration pro-
ceeds through it, and the cellular membrane posterior to the verte-
brae; but the worst effects of all produced by the syphilitic
action, are found on the larynx, which require immediate attention
as soon as they shew themselves; and in a short space of time, if
not checked, destroy life. Attending this affection there is always

* Termed Ozæna or fætid ulcer, discharging purulent matter, sometimes ac-
 companied with caries of the bones. Bichloride of mercury and lime water or
a solution of nitras arg. are the best local applications.—A. L.
Disease of the throat.

loss of the voice, so that you are obliged to put your ear to the patient's mouth, he speaks in so low a whisper. If he has no primary symptoms of syphilis on him at the time, you are not led at first to suspect that it is syphilitic, although whenever a person comes to you with loss of voice, you should always ask, How long it is since he had any sore on his yard? What space of time has elapsed since he had syphilis? This effect of the syphilitic disease more frequently destroys life than any other. Here is a specimen, taken from a female who died of this complaint. She was admitted into the hospital with a bronchocele; she had difficulty of breathing and little power of utterance, which were attributed to the pressure of the tumour on the larynx. When she had been in the hospital a little time, a syphilitic eruption made its appearance, by which it was discovered she had not very long ago had syphilis. Mercury was given her, but the disease had proceeded too far, and she died a few days after. On examining the throat, chancres were found, one on each side of the upper part of the larynx; there was no disease whatever of the lungs. The ulceration had proceeded to the laryngeal artery; this had given way, and part of the blood passed into the trachea. Portions of the thyroid cartilages are sometimes ossified in this disease, and coughed up. One of the cornua of the thyroid cartilage was coughed up by a patient of Mr. Forster's at the other hospital; it was converted into bone: the patient did very well.

The treatment required in syphilitic sore throat is as follows:—It will be necessary to make use of mercury, if the part is not too irritable, and the sore has no other character than in a healthy person, and does not affect the mouth more than is generally done when syphilis appears in any other part. Here you must endeavour to prevent the disease making those dreadful ravages, which I have described, on the soft palate and upper maxillary bone, producing an aperture which requires artificial means to close it. Mercurial fumigations are found the most efficient local means for sores of the palate; but if the roof of the mouth itself becomes affected, a little diluted muriatic or nitric acid will assist exfoliation, and prevent the aperture from being large. When the sores
are on the tonsils local means are not necessary, for a considerable portion of the tonsils may be lost without any bad effects being produced; constitutional remedies alone are generally employed. But with respect to myself, I am disposed to assist by local means the healing of syphilitic sores wherever they occur. When an aperture has been produced in the roof of the mouth, I put a piece of lint into the opening, and the consequence is, that the person does not speak through his nose so much, and is not exposed to the observations of his friends. As soon as exfoliation has taken place, it will be right to introduce some extraneous substance to fill up the aperture; and the best instrument I know is one contrived by Mr. Weiss, whom you all know to be an extremely ingenious man. A gentleman of rank and fortune, affected with sore in the roof of the mouth, applied to Mr. Weiss to know whether he could make him something which would fill up the opening, and remain there without producing inconvenience. Mr. Weiss immediately produced an instrument, which gave the gentleman the greatest comfort and satisfaction, and answers much better than any other with which I am acquainted.

When there is disease on the soft palate nothing can be worn, because any instrument, unless kept near the bone, would excite inflammation. M. Roux, of La Charité, at Paris, in a case of division of the soft palate, performed an operation for the purpose of closing the aperture, and on the same principle as the operation for hare lip. The operation was successful; it is certainly a very ingenious one.

[This fissure may be either congenital or accidental, and usually assumes one of the following varieties:—1. Where there is a simple slit in the middle of the velum palati, not extending through the bone. This is cured by the staphylo-raphe operation of M. Roux. 2. With partial division of the bone, or roof of the mouth; this requires the staphylo-plastic process for its cure. 3. With a complete division, in which case there will be an interspace between the two halves of it, frequently extending to the alveolar process and upper lip, termed labia leporina, or hare-lip: the process for remedying this deficiency is termed}
urano-plastic operation, from ωὐχανός, the firmament or arch, the palate; and πλαστός, to form. M. Roux's apparatus consists of 1. three flat ligatures; 2. of six small curved needles; 3. a porte-aiguille handle; 4. a pair of dressing forceps; 5. a probe-pointed bistoury; 6. scissors, with long handles and short blades, curved laterally to an obtuse angle.

The operation has been performed repeatedly by Messrs. Roux, Alcock, Brodie, Liston, Smith, of the United States, and Malgaigne.—Ed.]

With respect to affections of the larynx, you must act immediately on the system by mercury; I use the oxymurias hydrargyi, because it is the quickest in its operation. Mercurial fumigations locally, and the oxymurias hydrargyi internally; these are what I now employ. Some give the blue pill and opium, but I prefer the oxymuriate on account of its speedy effect.

LECTURE VII.

The next subject to which I shall direct your attention is the influence of syphilis on the nose.

The mucous membrane of the nose is liable to be affected by this disease, as well as the mucous membrane of the throat. Ulceration in this part very speedily affects the bones, which afterwards exfoliate, and the patient will be in danger of losing a considerable portion of the nose. The following are the symptoms which indicate the existence of this disease. The first circumstance of which the patient complains is an incrustation forming in the nose. On this incrustation being removed by the hand, a quantity of blood mixed with purulent matter is discharged. In two or three days similar incrustations are formed, and under these an ulceration takes place, which frequently lays bare the bone, and occasions the process of exfoliation. The bones very often separate by exfoliation long after the syphilitic
action has ceased. The number of bones which separate in this way is often very considerable: there is a preparation in the museum in which you will have an opportunity of observing a number of bones which separated from the nose by exfoliation in the same individual. The treatment of syphilis in the nose is similar to the treatment of it in other parts of the body. The constitutional treatment is precisely the same, but in addition to the constitutional treatment, local applications should be employed. Fumigating the part is attended with some advantage; injecting lotions are also sometimes found to be beneficial. Lotions of diluted nitric acid, or diluted muriatic acid, may be used with a view of healing the sores, and assisting the process of exfoliation. Fumigations are useful in clearing the nose of the accumulated incrustations. Steaming the nose with hot water assists in separating the incrustations, and affords considerable relief to the patient. Such is the treatment under ordinary circumstances.

If the bones of the nose have not become affected, there will be no great difficulty in conducting the cure; but there are cases in which very considerable difficulties will be encountered, and in which the most horrible deformities will frequently be the result. In general, you are to consider these deformities as the result, not of syphilis, but of the improper treatment of that disease. I will tell you what very often happens in cases of syphilitic disease in the nose. The patient undergoes a mercurial treatment, and the sores appear to be cured; but when the mercury has been left off for a time, and the person has returned to his ordinary employments, he finds the discharge again appearing in the nose, and as it becomes offensive, applies to a medical man. Under such circumstances it is frequently supposed that, though he has undergone a treatment which is usually sufficient for the cure of syphilis, the disease is yet not completely subdued, and he is put under a second course of mercury. This, gentlemen, is not only unnecessary, but extremely injurious to the patient. The disease of the nose is not the result of syphilis, but it arises from the process of exfoliation in an exposed portion of bone. During

Cases of deformity.

Treatment of syphilitic sores of the nose.
the time the mercury is given, the sores heal and the bone becomes dry. There is no discharge at this period; but after a time the process of exfoliation produces irritation and ulceration of the mucous membrane of the nose, which is generally, but erroneously, supposed to be syphilitic. If the patient be time after time subjected to fresh courses of mercury, these add to the mischief, and the most horrible deformities often ensue. The mercury, instead of assisting the exfoliation which is going on, adds to the inflammation, and produces other and most extensive exfoliations. Under proper treatment, no person, perhaps, ever lost his nose from syphilis; but the instances are very numerous in which this loss has arisen from the abuse of mercury. To prevent the great deformity which will arise in such cases, if an opening be formed through the skin in the upper part of the nose, a probe should be introduced to feel for the loose ossa nasi, which should be removed by a pair of forceps. The nose will be somewhat altered; there will be still some deformity, but not that horrible deformity which ensues, if the skin be allowed to give way in the upper part of the nose. Evaporating lotions should at the same time be employed, to prevent ulceration taking place through the skin. I witnessed, very early in life, a most unfortunate case of disease in the nose, which was occasioned by maltreatment, and which ruined the happiness and prosperity of the individual in whom it occurred. This person had embarked in business with the greatest possible degree of success, and his prospects were of the most flattering description. He retired for a time from his business, in consequence of a sore in his nose, accompanied with incrustations, which was believed by his surgeon to have been in the first instance syphilitic. A slight mercurial course was employed for his cure, and he got apparently well; but a short time after, the discharge from his nose returned. This led the surgeon to think that he had not been completely cured, and he accordingly put him upon a second course of mercury. Extensive exfoliations took place, and the bridge of his nose was sunk. Under these circumstances he was ashamed of appearing in business, and was under the necessity of consigning
it to other hands. The disease of the nose was still not entirely subdued, and he was put under a third course of mercury. This led to inflammation of the skin, the ossa nasi separated through it, and the most horrible deformity was produced. The state of his breath, and the smell issuing from his nose were most offensive; he was obliged to seclude himself entirely from all society, his prospects in life were completely ruined, his business went to decay, and he died in poverty and wretchedness. As these circumstances occurred to a man in a higher state of society than that in which we usually meet with such deplorable cases, they made a strong impression on my mind. Be upon your guard, therefore, against treating a renewed discharge from the nose as syphilitic, on the supposition that the mercury previously employed has not been sufficient to subdue the disease.

The next subject of which I shall speak is that of syphilitic eruptions.

Syphilitic eruptions are the mildest of the secondary symptoms of the venereal disease, and in general admit of an easy cure. The common character of syphilitic eruptions is, that they are of a copper colour, rising a little above the surface of the skin, and if they go on to ulceration, form thick incrustations first. They are attended with very little pain; an itching, rather than a painful sensation is felt in the part, which increases a little in the evening. There is a great variety in the character of venereal eruptions with respect to size; in fact, you very rarely see the eruptions in one patient exactly like those which occur in another. If you go round the syphilitic wards, and examine the appearances of the eruptions in the different patients who have that symptom; you will scarcely find them exactly alike in any two patients, in point of colour or size. In some you will find the eruptions of considerable magnitude, appearing as if a portion of copper skin was laid down upon the surface, but unattended with ulceration. In others you will observe deep ulceration with a very ragged edge; in others there will be scaly eruptions covering very large surfaces in various parts of the body. There is greater variety in the character of venereal eruptions,
than in any other symptom of the disease. You may satisfy yourselves of this fact by going round the hospitals, and at the same time appreciate the pretensions of those persons who ascribe one uniform character to this symptom of the disease. With respect to the parts in which venereal eruptions most frequently appear in the first instance, they are the head, face, and roots of the hair. Incrustations form about the hair of the head, and scabs appear on the forehead, breast, the palms of the hands, and sometimes the soles of the feet. The palms of the hands are more frequently attacked with venereal eruptions, than other parts of the body, because there is more vigour of circulation in these parts; the parts where the circulation is more feeble, are less liable to be attacked.

The treatment of venereal eruptions is of the most simple kind. You will pursue the same constitutional treatment which I have already advised; give ten grains of the blue pill united with opium at night, and five in the morning; or five grains at night and five in the morning. The pilula submuriatis hydargyri composita, or Plummer's pill combined with the decoction of sarsaparilla is sometimes employed for the cure of this venereal symptom. Five grains of Plummer's pill may be given at night, and half a pint of the decoction drank daily. The compound decoction of sarsaparilla will remove this symptom for a time; but the disease will reappear, and you are never sure that the patient will not return with syphilitic symptoms. Even Plummer's pill united with the compound decoction of sarsaparilla, unless it be continued for a very considerable time, cannot be depended upon. It should be given from six weeks at least to two months to prevent a return of the disease. The eruptions will often yield in a very short time, but unless you continue the medicine till the syphilitic action is destroyed, the disease will return. Nothing can be more absurd—nothing can shew a greater ignorance of the true principle of treatment which should be followed in this disease, than to suspend the use of the medicine as soon as the symptoms disappear. Venereal eruptions sometimes shew an irritable disposition, as well as other symptoms of the disease, from which the parts will be in danger of slough-
ing. Whenever this irritable disposition appears, suspend the use of mercury, and give the compound decoction of sarsaparilla alone in considerable quantities. It will be better not to combine the decoction with mercury in any form; if you add any thing, let it be opium and nitric acid. The opium lessens irritability, and the nitric acid has sometimes a specific action on sores of this kind. Irritable eruptions are very often improved by the exhibition of nitric acid, which not only has a specific effect on them, but restores the general health of the patient. If the opium disagrees with the stomach of the patient, it will defeat the object of restoring his general health, and in that case should not be combined with the nitric acid. With respect to local treatment, the best application is mercurial ointment with opium; an ounce of the ointment with a drachm of the extract of opium. This and the nitric acid lotion diminish irritability better than any other applications. The epithema* composed of the liquor plumbi subacetatis with the mel rosae, and tinctura opii is often found to be useful. Carrot poultices, the solution of the nitrate of silver, and a great variety of applications are employed with the same view.

I shall now proceed to describe to you the syphilitic diseases of the periosteum and bones.

The third effect of the syphilitic poison is on the periosteum, and on the bones. It first attacks the periosteum, and the bones subsequently become affected. The cylindrical bones, which are most exposed to vicissitudes of temperature, are commonly first attacked; those which are much covered by muscle are rarely affected. The back part of the tibia, for instance, which is covered by muscles, is very rarely affected with nodes, though nothing is more common than to see venereal nodes on the shin bone, which is only covered with skin and periosteum. Sometimes they are seated on the outer side of the tibia, towards the fibula; if they are seated on the fibula, it is where it is only slightly covered; and

* Epithema, from ἐπί, upon, and ἔπημω, to apply,—any external application.
if on the ulna, it is where it is covered only by skin and periosteum. Nodes on the os humeri, except on the outer side, are of very rare occurrence. The symptoms by which this disease is characterised are as follow:—Some weeks after the chancre has healed, the patient experiences in the evening a sensation of pain in the bone, which is afterwards the seat of the node. This pain does not immediately produce a swelling, but, in the course of a few days, a swelling appears in the evening, which disappears again on the following morning. It is excessively tender and painful in the evening, but in the morning it is hardly perceptible; there is scarcely any swelling or tenderness. At this time the periosteum only is affected, but when the inflammation has continued for some time longer, the bone is affected and soon becomes enlarged. The first effect is an inflammation of the periosteum, but in a short time a deposit takes place between it and the surface of the bone; this deposit is, in the first instance, only a serous fluid, but a cartilaginous substance is soon secreted, which is gradually converted into bone. Though, in the first instance, therefore, there is only an inflammation of the periosteum, the fluid secreted in consequence of this inflammation is soon converted into an ossific enlargement.

The treatment of this disease is not different from that which is necessary for the other symptoms of syphilis. Give the blue pill united with opium; the compound decoction of sarsaparilla is sometimes added with a view of preventing any disposition to irritability in the diseased part. This, however, is not necessary: the blue pill with opium will be sufficient to effect the cure. As to any local treatment, no other will be necessary, except the simple application of evaporating lotions, which certainly assist in getting rid of inflammation. When the inflammation has ceased, if there is any enlargement of the bone, a stimulating plaster, as the emplastrum ammoniaci cum hydrargyro should be employed*. The skeleton on the table affords a curious illustration of the effect produced

* The solid Nit. Argenti frequently applied, and followed up by the Ung. Hydrar. Iodidi, will soon remove the nodes and asperities of the bones; but this local remedy ought not to supersede the constitutional treatment.—Ed.
by mercury on the bones. Though the treatment of nodes, when attended to early, is very simple, cases sometimes occur in which considerable difficulty arises. You will sometimes find a considerable quantity of serous fluid fluctuating between the periosteum and bone. When this fluctuation is unaccompanied with inflammation and redness of the skin, there will be no necessity to cut down upon the bone; if you do so, you will run the risk of producing exfoliation. Such a fluctuation as this may be removed by adding a little to the influence of the mercury. I have seen large accumulations of serum in the forehead and shin bone entirely absorbed by giving an additional quantity of mercury, and assisting absorption by the application of a blister. When the fluctuation, however, is accompanied with an appearance of redness in the skin, and much pain in the part, indicating the existence of matter, it will be impossible to promote absorption by any means, and the sooner an incision is made on the bone the better. The exfoliation which will afterwards take place, will be proportioned to the extent of surface laid bare, and if you delay making the opening till the extent of surface affected is very considerable, you will only be adding to the evil. As soon, therefore, as you discover a fluctuation, accompanied with redness of the skin, make an incision for the purpose of discharging the matter. Very extensive exfoliations sometimes follow the opening of nodes, and the life of the patient will be in danger. Many persons die from this cause; there is in the college a very fine specimen taken from a person who died in consequence of the exfoliations which followed the opening of nodes in both his tibias. The flat bones are sometimes the subject of syphilitic symptoms; that which is more commonly affected than any other, is the os frontis. The symptoms are the same as those of nodes on the shins. The patient has pain and swelling in the evening, which last till two or three o’clock in the morning, when they disappear. This continues day after day until an enlargement of the bone is produced. Nodes now and then occur in the parietal bones, very rarely in the os occipitis, and never in the os temporis, that bone being much covered by muscles, and exposed
to very little change of temperature. The os frontis, which is the most exposed of the bones of the head, is that in which the disease is most frequently seen. It sometimes happens when this disease attacks the flat bones, that it is attended with a very considerable tumour and fluctuation. No incision should be made under such circumstances. Now and then, indeed, the suppurative process takes place, and a most serious disease is the result. When the skin is inflamed and matter is formed beneath, it will be right to discharge it. It often happens, when matter is formed on the surface of the bone, that the suppurative process also takes place between the dura mater and the internal part of the skull. Death sometimes ensues from this cause; but fatal consequences may often be prevented by trephining the patient. A patient in the other hospital had a node on the os frontis which suppurated; the matter was discharged, but some time after, the patient complained of violent pain in the head, which was succeeded by coma, so that there was no doubt in the mind of the surgeon of the hospital, that the patient was the subject of pressure on the brain. The surgeon determined to trephine him, and on raising a portion of exfoliating bone, a quantity of matter directly issued from beneath. The old surgeons were in the habit of perforating the bone, for the purpose of discharging the matter formed beneath. The best mode of saving the life of the patient, however, is to apply the trephine, and by taking out a portion of the exfoliating bone, give immediate relief to the brain, by removing the pressure produced by the matter formed between the dura mater and the bone. There is a specimen on the table, taken from a case in which the operation was successful. The man died many weeks after the operation in a comatose state, and upon examination after death, it appeared that matter had formed under the sagittal suture, which pressed upon the brain, and was the cause of death. He was relieved by the first operation, and he would probably have been relieved again by similar treatment, but there was not sufficient evidence of the existence of matter to justify a repetition of the operation. Whenever you are called to a case in which exfoliation of the bones of
the skull is accompanied with symptoms of pressure on the brain, you may infer that matter has formed between the dura mater and the bone, and it will be right to apply the trephine. This observation applies not only to cases of syphilitic disease, but to all cases of exfoliation of the bones of the skull, accompanied with coma. Here is a skull (exhibiting it to the class) originally affected by syphilis; see, gentlemen, what a lantern it became. The subject of this disease died, as I believe, chiefly from the injudicious continuance of mercury. He was a man of bad constitution, and there was great difficulty in curing the primary symptoms of the disease. He had subsequently a node on the forehead, which was followed by inflammation and suppuration of other parts of the head, till the ulcerative process extended over the whole surface. He died ultimately of anasarca. It can scarcely have escaped your observation, that patients applying for admission to the hospital, frequently complain of having pains all over them. They will tell you that they have pains down their arms and legs, which become worse at night when they are warm in bed, and that they have formerly had some venereal complaint, for which mercury has been given till the mouth has been rendered severely sore. If you ask them whether they were exposed to cold during the time they took the mercury, they will answer in the affirmative. Such persons, gentlemen, we do not admit into the hospitals; we only tell them to take care of themselves, and to keep themselves as warm as possible, and that after a time the disease will disappear. These pains are readily distinguishable from those which proceed from the syphilitic poison. Syphilitic pains commonly attack the shins, but they never put their hands to this part of the body. They complain of pains from the upper to the lower part of the arm, pains about the chest and about the hips. These are mercurial, not venereal pains. You have an opportunity of seeing an example of this disease in the skeleton on the table, in which the mercury has affected the ribs, the sternum, the tibia, and in short almost every bone in the body. A deposit of earthy matter is formed between the periosteum and

Application of the trephine.
the bone, so as to case the surface of the bone. Patients suffer exceedingly from mercurial diseases of the bones, much more indeed than from syphilitic pains. You should direct them to pay strict attention to temperature, and give them the compound decoction of sarsaparilla. This plan of treatment will be sufficient for the cure of this disease. I shall in the next evening’s Lecture close the subject of syphilis by some general remarks on that disease.

LECTURE VIII.

I shall to-night deviate from my usual custom, and give this evening’s Lecture from notes.

The symptoms of syphilis are divided into primary and secondary: chancre and bubo come under the former denomination, and under the latter, sore throat, eruptions, nodes, and disease of the nose; these secondary symptoms are the consequences of the absorption of the venereal poison into the system, and its circulation through the blood.

Some parts of the body are incapable of being acted upon by the venereal poison, as the brain, heart, and abdominal viscera; indeed the venereal poison does not appear to be capable of exercising its destructive influence on the vital organs, or those parts most essential to the welfare and continuance of life: but the bones, muscles, tendons, and skin readily partake of its malignant nature. As some parts of the body more readily take on the venereal action than others, so some individuals are much sooner than others infected by the venereal poison. Many men (to their shame be it spoken) make a boast of having kept every description of female society, and yet having always escaped from any attacks of the venereal disease, gonorrhoea as well as chancre.

The time at which the secondary symptoms usually appear is from eight to sixteen weeks generally, sometimes between those
two periods; eight weeks may be taken as the earliest period, and sixteen as the most remote; but in both respects there is a large number of exceptions, for the secondary symptoms are continually appearing, at an earlier date than the eighth week, and at a much later one than the sixteenth. As a general remark, I may observe, that the tenth week is the most usual time at which they appear; sometimes the appearance of the secondary symptoms is protracted in consequence of the system labouring or suffering under the irritation of another disease, as diarrhœa, for example.

In my notes, I have written down a number of questions, and which questions I used to be in the habit of putting to myself; you shall now hear what they are; and first, Is a child liable to be affected by syphilis when in utero?

Mr. Hunter said, that a child in utero could not be infected by this disease; now Mr. Hunter was, unquestionably, a man who possessed so much judgment in his profession, that his opinions are entitled to the greatest respect and attention; he is an authority to which we are all inclined to bow with deference and submission. We must not, however, think so highly of his opinion in opposition to facts which we have ourselves observed, and if I know any thing of my profession, I have seen syphilis in a child immediately after birth: therefore, in this particular instance, Mr. Hunter was mistaken.* Within twenty-four hours after their entrance into the world, such children have the palms of their hands, the soles of their feet, and the nates, covered with copper-coloured eruptions, and the nails at the same time generally beginning to peel off; and unless something be done for the relief of the little sufferers, they will be quickly carried off from the violence of the disease; indeed, many children do die from it, in consequence of the true nature of the complaint not being understood by the medical practitioner; in these cases you give the mother a quantity of mercury, the influence of which is communicated to the child, through the medium of the milk, and it becomes cured of the syphilitic disease.

* I have had several cases in confirmation of this opinion.—Ed.
A most curious circumstance connected with this subject is, that a woman, when pregnant, cannot be cured of syphilis; you may give mercury and cause the disappearance of the primary symptoms, but after delivery, the secondary effects are very soon manifested in different parts of the body; the primary symptoms, therefore, are relieved as quickly as usual, but it is evident that the poison is not eradicated from the constitution, by disease breaking forth immediately after the birth of a child. I once saw a lady six months advanced in pregnancy, having an extensive syphilitic eruption, for which mercury was administered, and the eruption disappeared; after this she went her full time, but when delivered, the nates of the child, together with the palms of the hands and the soles of the feet, were covered by a genuine syphilitic eruption. I gave the child hydrarg. cum cret.; under this treatment it manifested little improvement.

A month afterwards I saw the mother; she had an ulcerated sore throat, and syphilis, altogether as well marked as in any case I ever witnessed; mercury was again given to her, when both parent and child perfectly recovered. Since the occurrence of the above case, I have witnessed several similar ones, in each of which the secondary symptoms could not be completely cured during the pregnant state. I think, however, that a pregnant woman may be cured of the primary syphilitic symptoms although not of the secondary.

The next question I have put down in my notes, is this:—Does much inflammation usually attend syphilis? No direct answer can be given to this question, for the degree of inflammation which attends is proportioned to the healthy or irritable state of the patient. In a healthy person the venereal disease is slow in its progress, and but little inflammation accompanies it; on the other hand, in the irritable person it is rapid in its progress, and accompanied by considerable inflammatory action; therefore the differences which characterise the syphilitic disease in various persons do not arise from any peculiarity of the poison itself, but from the peculiar condition of the person on whom it falls; exactly similar to what often happens in small pox; two men receiving the infection from
the same individual shall have the disease, one particularly mild, while in the other it is of a malignant confluent kind; therefore the degree of inflammation or manifestations of violence which mark the course of the disease, are not to be attributed to any peculiarity existing in the poison, but solely from the particular condition of the infected person. Although syphilis is not at first a malignant, yet it must always be considered a serious complaint, and should command the most decided attention. Though not at first malignant, consisting merely of a chancre or bubo, it soon becomes so, unless its chancre be checked, and its progress will be marked by the secondary symptoms, which I have already described.

Therefore, in answer to the question just now put, what I should say is this: one constitution upon receiving the venereal poison, will have in it a considerable degree of inflammatory action excited, quickly leading to the destruction of life, whilst another constitution will scarcely be influenced by the reception of the venereal poison.

The next question I ask myself is, Whether there is any constitutional affection produced in syphilitic disease? I am again compelled to say, that that great authority, Mr. Hunter, is also wrong here; for he has stated that the disease is merely local. What, gentlemen, should I say if one of you were to come to me to-morrow, stating that you had a chancre about eight, nine, or ten weeks ago, and that you had felt yourself exceedingly indisposed, having evening exacerbations, fever and sore throat, and that at length your body had become covered with a copper-coloured eruption? How can we say that there is no constitutional affection here? Do not the evening exacerbations which commence about five o'clock, and do not terminate till two or later in the morning, plainly show that the disease when so far advanced is constitutional? Most certainly it is so, and can scarcely be any longer a matter of dispute.

It is not necessary that you should study much for the purpose of being enabled to understand this constitutional influence; go to-morrow into the foul wards of these hospitals; find any man
there having venereal sore throat; you will ask him but very few questions before you are convinced that the constitutional influence has been produced.

The next question I have put down is, Whether the matter of secondary venereal ulcer be infectious or not? Mr. Hunter said that it was not so; however, for my own part, from what I have both seen and heard, I should hesitate for a considerable time before I could join in this assertion. A physician of my acquaintance witnessed the following case:—a gentleman came from the country in an exceedingly anxious state of mind, and evidently very much agitated, for the purpose of consulting him respecting an eruption which existed on the body of his lady; accordingly the doctor visited the lady, and found the eruption to be venereal. The doctor asked the gentleman how long he had been married, and he replied six months. He added, that four months before marriage, he had a sore on the penis, which was healed by local application; three months after marriage, both his wife and himself had bad sore throats, which were soon cured by taking mercury. During this time, and during the existence of the venereal eruptions, not knowing the nature of the complaint, the connubial intercourse had been continued. Now, if any dependence can be placed upon the report of this gentleman, the case is most decisive of the matter of secondary ulcer being capable of propagating the disease, for he had no primary symptoms by which the complaint could have been communicated to his wife, as the chancre was healed four months previous to marriage. I do not know, but I believe the disease may be communicated through the influence of the parent's, or the nurse's milk. I believe that I have seen examples of this description.

Is the matter of bubo infectious? Not as far as experiments have gone; the matter of bubo inserted in the skin has produced no appearance of chancre; for my own part, I think there is but very little difference between the matter of bubo, and that of common abscess.

Are gonorrhoea and syphilis the same disease? On this point there is no difficulty for any one to satisfy himself, and he will
soon be convinced that there are no two diseases in the world more decidedly different. Now, gentlemen, to prove this, let a man who has a very bad gonorrhœa, apply four or half a dozen leeches near the glans penis, and then draw over the skin, so that the sores made by the leeches, may be embedded in the gonorrhœal matter; well, gentlemen, will chancres be the consequence? will secondary symptoms ensue as consequences of the experiment? No. Neither one nor the other will be seen, and one cannot well conceive a more conclusive fact than this.

Mr. Thurston, in 1801, made the following experiment on a young cantab. having gonorrhœa in an excessive degree, with ardor urinæ. Mr. T. took some of the discharge and introduced it into the prepuce; he inserted it in two places, thus making two sores; both wounds however healed kindly without producing the slightest appearance of chancre, or the most trivial constitutional symptom. After such experiments as these, it would be madness to say the two diseases are alike; and those persons who think so, entertain wrong notions of the subject; or, unfortunately, their minds may be governed by prejudice, and consequently are incapable of receiving proper impressions. Let me urge you, therefore, not to continue to think, that gonorrhœa and syphilis are the same disease.

The next question is this, Are those parts of the body which are liable to syphilis, subject to other diseases similar in appearance to syphilitic? Yes, the glans penis, for example, is subject to ulceration from various causes, and the ulcers occasionally very much resemble chancre; this last sore, however, often possesses a specific character by which its true nature can with the utmost correctness be ascertained. Although you are thus frequently enabled to determine that a sore is really chancrous, thus capable of confidently asserting that it is syphilitic, yet at the same time there is often great difficulty in saying what is not so; for example, excoriations may exist on the glans, to which syphilitic matter may have been applied, and the poison may have entered into the constitution, through the medium of the broken surfaces,
ON THE VENEREAL DISEASE.

without having time to produce in the sores themselves the true syphilitic character; if, therefore, a patient were to come to you under such circumstances, and after having had connexion with a suspicious person, if he were to inquire of you whether the sores were syphilitic or not, you had better explain to him what I have just stated to you; and likewise tell him, that although the ulcers have not then the syphilitic aspect, yet that he may in reality be infected, but that there has not been sufficient time for the parts to assume their peculiarly marked syphilitic character; tell him to make his mind easy, watch the appearance of the parts; let him watch and see the result, without subjecting himself, at all hazards, to a course of mercury, for the cure of a disease which never required its employment. Mercury itself, unfortunately, produces diseases very similar, both in appearance and effect, to syphilis. I recollect, at the commencement of my studies at these hospitals, one day, on going round the wards with a surgeon, having been very much surprised to see mercury so indiscriminately employed, and at seeing every poor emaciated wretch continually rubbing in; there was one individual, I remember, in a dreadful state, who had been using mercury for a great length of time, and under which treatment he continued to get rather worse than better. In this case I took the liberty of suggesting the propriety of discontinuing the mercury; when in a short time the patient became completely cured.

Mercurial sores. Mercury in reality, when given injudiciously, or to excess, will sometimes produce ulcers, which a man of little experience would say were venereal. Again, in ulcerated sore throat, a careless observer might mistake common ulcers for venereal ones; the former, however, are known to be superficial, and may generally be removed by ordinary purgatives; whereas the latter are deep, with elevated edges, having the same appearance as chancres on the penis. I recollect a gentleman once coming to me, and standing before me as well as he could, "Pray sir," said he, "what do you think is the matter with me?" "What!" said I, "why you are poxed up to the eyes." Seeing him in such a state, this was my involuntary
reply, not the most elegant certainly. I told him that he was not
then in a fit state to take mercury, being emaciated and in a state
of great irritability, and that he had better for a time go to the
sea side, use the warm bath, and then return to me again. Some
time afterwards he did return, so much altered that I did not
know him, for he was looking florid, and had grown quite lusty.
He told me that he had come back perfectly recovered, without
having taken a single grain of mercury. Therefore, gentlemen,
when you see disease situated in those parts liable to syphilis, and
which disease resembles syphilis, you should be particularly cau-
tious in forming your judgment, and take care not to submit your
patient to a course of mercury, which will probably render his
condition a thousand times worse.

Before you administer a course of mercury, you should possess
the most unequivocal evidence of its being required; and when
you are in doubt as to the nature of those diseases which resem-
ble syphilis, your best plan will be to administer five grains of
the pil. hydrarg. submur. compos. omni nocte, et 5viij. decoct.
sarsaparil. compos. two or three times in the day; these medicines
will be found the best for the cure of the disease, upon the prin-
ciple of restoring the secretions.

The next question, Is syphilis always progressive without the
use of mercury? The answer to it will be found in the reply to
the following question:—

Is chancre curable without the use of mercury? To this I re-
ply, that mercury is by no means necessary to procure the healing
of chancre, at least not always. Some chancre certainly will not
heal without mercury; and this is more especially the case when
they are deep seated, or of long standing. But, on the other
hand, when the sore is slight, superficial, and recent, a wash com-
posed of brandy and water, or wine and water, will often cause
them to heal without any other application; therefore, mercury is
by no means always necessary to procure the healing of chancre;
but chancre, as described by Mr. Hunter, and according to his
account, will not heal without it; it is now, however, well known
that the position taken by Mr. Hunter is untenable, and that mercury is not in every instance necessary to accomplish the healing of chancre.

The modus operandi of mercury has been supposed to be that of exciting in the system a general fever, which overcomes and subdues the syphilitic action. This may or may not be true, God only knows. We are well acquainted with the fact, that many medicines have such a specific influence over certain diseases, that they cure those diseases; but we know nothing of the peculiar mode of action on the part of the medicine, by which it overpowers and destroys the disease. Would not a man be laughed at, who attempted to point out the manner in which bark cures ague, or colchicum gout? In the present state of our knowledge, it is impossible satisfactorily to account for these phenomena; sufficient experiments have not yet been made to guide our judgment or direct our minds toward a correct and positive conclusion. To possess satisfactory information on this point may be desirable; but I consider it of much more consequence to know how to effectually cure a disease, and to prevent its return. I say, if a surgeon once permit the secondary symptoms of syphilis to appear, that it is difficult to say where the dangerous consequences will terminate—difficult to point out what may prove the sequel.

Gentlemen, I can tell you that twenty years ago, it was considered a great disgrace to a surgeon to permit secondary symptoms to appear; at that time the great object was to effectually cure the primary symptoms, so as altogether to prevent the occurrence of the secondary. Unfortunately, at the present time, secondary symptoms present themselves to our notice, and much more frequently than twenty years ago. I will tell you how it happens; practitioners at that period were in the habit of giving mercury in every case of venereal disease, whether primary or secondary, and administered the remedy with a regularity and caution which I wish were observed at the present day; they used to exhibit the mercury not only whilst the disease lasted, but for some time after it had disappeared; and their usual practice was to give it, three
weeks for chancre; a month for chancre and bubo; and if for secondary symptoms, the remedy was continued for a still longer period. Though the disease should disappear quickly after beginning the mercury, yet remember that it is not cured, and the medicine should be continued for the above-mentioned periods; if the medicine be omitted for two or three days, you should consider this as so much lost time, and it must not be forgotten in the aggregate account; three weeks will be generally found a sufficient length of time for the cure of the chancre; a month for chancre and bubo; and in case of secondary symptoms, the patient will not be safe until the expiration of five or six weeks. Persons often go to medical men with chancres, receive from the practitioners a box or two of pills, and are then sent about their business; a man had better never visit a doctor at all, than be submitted to such treatment as this; it is often calculated to throw him off his guard, may lead him to suppose that he is cured, when in reality he is not so, and may ultimately terminate in the complete destruction of his constitution.

Sometimes mercury disagrees with the patient; then of course you must either discontinue it, or temper it by combining it with some other medicine calculated to prevent its disturbing the constitution, if the patient be too irritable to take mercury; and should you find this to be the case, cease for a while to administer it, improve the general health, and its employment may be again resumed. I may here observe to you, that when a man is in health, mercury will generally agree with him very well, but if feeble or irritable, it then often induces sloughing, and severe constitutional irritation.

The best form in which mercury can be given is that of the blue pill, ten grains at night and ten in the morning; ten at night and ten in the morning is the utmost extent to which the dose should be carried; in ordinary cases, ten grains at night and five in the morning will be found quite sufficient. Should the mercury produce diarrhoea, a quarter of a grain of opium should be added to every five grains of the blue pill. As the compound decoction
of sarsaparilla assists the action of the mercury, a half a pint of it may be taken two or three times in the course of every day, while under the mercurial influence; as to rubbing in the mercurial ointment, it is seldom done perfectly, and is seldom adopted, except where the internal exhibition of the medicine occasions so much disorder of the stomach and bowels, that it cannot be introduced into the system any other way.

About the time that I commenced practice, (not hospital practice,) a woman mentioned a curious circumstance to me, which was, that she had been taking mercury, and that it had occasioned the salivation of her child, without having produced any obvious effect upon herself.

Another curious circumstance is, that no mercury can be found in the blood or secretions of those who are in a state of salivation. I sent to Mr. Allen a pint of blood taken from a salivated person, I also sent him a quart of saliva ejected by a person in a similar state, and also a quart of urine, with a request that he would subject them to the most minute chemical analysis, for the purpose of discovering whether any mercury could be detected in either, yet not an atom could be discovered; now you all know that the thousandth part of the oxymuriate of mercury might be detected in several pints of water, or in blood.

The last circumstance connected with this subject, to which I shall call your attention, is the most important of all, and which is this, viz. Is any other medicine but mercury capable of curing syphilis? Remedy after remedy has been sent forth to the world as having the power to effect this; and now I will tell you all that I know respecting the matter. Mr. Rose, late of the Guards, now an eminent surgeon at the west end of the town, about eight or ten years ago, very laudably tried numerous interesting experiments, for the purpose of attempting to cure the venereal disease; also with a view to ascertain what number of persons would be affected by secondary symptoms if the mercury was not employed. Mr. Rose found that the primary symptoms of the syphilis could be readily cured without the aid of mercury, and that
out of every three patients so treated, one was afflicted with syphilitic secondary symptoms.

Now, gentlemen, I saw Mr. Rose upon the subject; he is a very sensible, candid man, and upon whose experiments the utmost reliance may be placed; another surgeon says, that two out of every nine, have secondary symptoms, making one out of every four and a half. I rely, however, upon the statement made by Mr. Rose. If secondary symptoms did present themselves, they were treated without mercury, and would disappear, would come again, and again disappear. Still not being satisfied with this, I said to Mr. Rose, "Now, sir, if a gentleman were to come under your care, what would you do,—would you give him mercury or not?" Mr. Rose was not, like some men, so wedded to his system as to have his mind fettered by prejudice, and he with much sense replied, that he should certainly give the patient mercury; and, gentlemen, I advise you to do the same. I will not say that those persons are dishonest who recommend contrary practice; but if they had seen what I have, I am sure they would still place their reliance in the use of mercury.

Some men are so prejudiced in favour of particular remedies, that the strongest possible facts which can be brought forward in opposition to their opinions, are not capable of producing the slightest alteration, or even a transient impression of their error. Now for a case in point:—a gentleman went to a surgeon in the month of January, showed him a sore upon his penis, and asked him what it was; "Why, chancre," said the surgeon, "you must take sarsaparilla." He went to him again in February, telling him that it appeared again; and on asking the surgeon what he was to do, the surgeon replied, "You must take sarsaparilla." He repeated his visit in March, stating that although his sore had vanished for a time, yet it had again appeared in the same situation. "Well," said the surgeon, "you must take sarsaparilla." In June the patient repeated his visit, having at the time a venereal sore throat, together with a copper-coloured eruption on the skin, and said to the doctor, "What am I to do now?" "Take sarsaparilla;" the use of
which caused the disappearance of the secondary symptoms, but in the following August violent inflammation made its appearance in both eyes, so that the gentleman was obliged to be kept in a dark room, to be bled, purged, and kept on the lowest possible diet; and notwithstanding all these precautions, the virulence of the inflammation endangered the loss of his eyes; at length the inflammation of the eyes having been subdued; in the ensuing September, a venereal eruption again made its appearance on the skin; there were also pains in the bones, and a sore throat. The gentleman again visited his doctor, and inquired once more what he must do to rid himself of his horrible complaints. "Why," says the doctor, very gravely, "why, you must take sarsaparilla!!" and, replied the gentleman, "I'll be d—d if I do, but I will take advice"; and shortly afterwards he consulted me. At the time I saw him, he had severe pains in the limbs and joints, venereal eruptions on the skin, and an ulcerated throat; he asked me what was his disease, and I at once told him, confirmed syphilis; he then detailed to me the history I have just mentioned to you. "Well, sir," said I, "adhere to the old Dutch motto, 'Do right and never look back,' and give yourself no uneasiness about the past, as what has happened cannot be prevented." I prescribed for him ten grains of blue pill night and morning, and a quarter of a grain of opium to each pill. About ten or eleven weeks afterwards he called upon me, and his appearance had undergone so great a change, that I had entirely forgotten him; he soon, however, informed me who he was, and stated that he was completely restored to health. I mention this case to you, to show you both the folly and the danger of treating the primary symptoms of syphilis with any other remedy than mercury; and also to point out to you the dangerous consequences of being prejudiced in favour of a remedy, and which prejudice the repeated failure of the remedy could not surmount. Now, if you should unfortunately neglect to give mercury for the removal of primary syphilitic symptoms, let me exhort you never to be guilty of a similar neglect as regards the secondary; but the moment
they are presented to your notice, that instant commence exhibiting mercury, if the state of the patient will permit. All secondary symptoms, I am positive, may be prevented by a few grains of blue pill judiciously given. In saying this, do not let me refuse that tribute which is due to the ability and candour of Mr. Rose, whose experiments were conducted in a very judicious manner, and their results faithfully and honestly communicated to the profession. If, then, under the most favourable circumstances, and under the most judicious management, secondary symptoms will appear, unless mercury be employed, is it right to withhold that remedy from those who are afflicted with the venereal disease? Recollect, gentlemen, who Mr. Rose's patients were; they were soldiers under orders, at the command of their officers, and as the treatment appeared to be unexceptionable, they were obliged to comply with it; you cannot expect to find your patients to be so circumstanced, nor will you find them subordinate. Considering all the circumstances, I strenuously and conscientiously advise you to adopt that plan which I have so often felt it my duty to give you in the course of this lecture. I have only one more observation to make, which is, that syphilis should be cured by a slight, and not by a violent mercurial action; continue to give it for the period I have already mentioned, but do not produce what is commonly termed salivation; it would rather prove injurious than beneficial.
In order to render this Treatise on Syphilis as complete as the limits of the work will permit, the Editor deems it consistent with his plan to add, as a most appropriate supplement to those already given, some of the excellent Lectures of William Lawrence, F.R.S., Senior Surgeon to St. Bartholomew's Hospital, and Lecturer on Surgery at that Hospital, a man whose profound learning, mature judgment, and extensive field for observation, claim the highest consideration for his opinions.

The various appearances which are included in the term syphilis fall under two general divisions, the primary and secondary symptoms of the disease. The primary symptoms consist of those which are immediately produced by the application of the poison to the human body; that is, ulcerations, and swellings of the glands consequent on those ulcerations; primary ulcers; and buboes, the technical term given to those glandular swellings in the groin, which arise from ulcerations taking place in the generative organs of either sex. The ulcerations are very commonly
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called chancres; so that when we speak of primary symptoms, we say they consist of chancres and buboes. The secondary symptoms consist of various affections of the skin, of the throat, of the tonsils, of the mouth, of the eyes, of the nose, of the ears, of the testicles, of the bones and of the joints. These latter are the affections by which the constitutional form of the disease is distinguished.

The occurrence of constitutional symptoms is not necessary to the existence of syphilis, for it may consist chiefly in the appearance of the primary symptoms just mentioned; that is, of ulcerations of the generative organs, with or without buboes. All such primary are not invariably followed by secondary symptoms. Out of a given number of cases of primary symptoms, under any kind of treatment, you will find secondary symptoms only in a certain proportion of them. This proportion is differently stated by different observers. Some have remarked, that the secondary symptoms will take place in one out of three cases; others say they are not to be expected in more than one out of twenty cases; at all events we have syphilis, recognised as such, without the occurrence of any secondary symptoms.

Now the word syphilis, as I have explained it to you, does not denote any single affection of any single texture. Like scrofula, it is a general term, under which are included affections of a variety of textures and organs of the body.

Syphilis can only be produced by a poison communicated from a diseased to another person. In the great majority of instances this morbid influence is caused by the secretion of a sore, which, being applied to the sound surface of a healthy part, produces the primary symptoms of the disease. The matter, or pus, thus secreted from a primary venereal sore, is capable of infecting another person to whom it is applied—that is unequivocal. The next question will be,—Is the poison equally conveyed by the matter formed in a bubo? That I do not know.

Further, the venereal infection is conveyed by the blood of the mother to the child in utero, especially when the mother labours...
under the secondary, or constitutional form of the disease. Whether it is equally conveyed in the primary form of the disease I am not exactly aware. A question naturally arises, whether the female can receive the disease by connexion with a man who has secondary symptoms? And this is a question rather difficult to solve, from the want of clear evidence on the point. When we come to question individuals upon the subject, the motives for concealment are so strong, in a case where the honour of the parties is so much concerned, that it is very difficult to obtain testimony on which our reliance can be placed. I can only say, however, that I have seen some instances where, from all the inquiries I could make, I was led to conclude that syphilis had been communicated in this way from husband to wife; that is, when the husband was labouring under constitutional symptoms, he had cohabited with his wife, and communicated to her the disease. I do not see any impossibility in its being communicated in this way. The communication of it from the mother to the child in utero clearly shows that the blood of the mother becomes affected; and if blood be capable of transmitting the disease, I do not see why the seminal secretion should not be equally capable of transmitting it; this is a point, however, about which we have no clear knowledge.

We frequently meet with the expression, venereal poison, or virus, and we are naturally anxious to know what that poison or virus is. Now, the only explanation I could give of it would be this, that it is that state of the secretion of a sore, which renders it capable of producing the disease in another person; that it is that state of the blood in the mother which renders it capable of communicating the disease to the foetus in utero, but what that particular state is, we are unable to describe; we are only able to observe its effects; that is, we have no knowledge of any chemical changes or properties by which the matter of a sore of this kind, or by which the blood of a pregnant woman, under such affections, differs from ordinary matter or ordinary blood. We are only conscious of the difference from the effects. When, there-
fore, we read of the venereal virus entering the constitution, or of its being expelled from the constitution, or of the constitution being impregnated, or of its lurking in the system, these are so many figurative expressions which have no precise meaning.

The next question is, whether there is one kind of poison, or whether there are more venereal poisons than one? Now, inasmuch as the real nature of the poison, that is, the real source of the symptoms, is so far unknown to us as I have just explained to you, this question resolves itself into another, which is, whether, among the various symptoms we recognise as syphilitic, there are such differences; and whether those differences are constantly observed in such states as to induce us to refer them to different sources? We must acknowledge that, on a superficial view of the subject, there is a considerable diversity of those symptoms to which we give the name of venereal, or syphilitic; that there is considerable diversity, whether we regard the primary or the secondary symptoms. The primary may be a simple abrasion of the cuticle, or an excoriated ulcer, or an ulcer with an indurated base or edge, or a phagedenic or a sloughing ulcer. Syphilis may consist either of an ulcer alone, or of an ulcer with a bubo; or it may consist of those primary symptoms, followed by papular, tubercular, or scaly eruptions of the skin; or by ulceration of the skin; or by superficial or excavated ulcerations of the tonsils, and sometimes of an enlargement of the bones, periosteum, or of the joints. Heretofore all the appearances called syphilitic were referred to one source; they were considered only as the various effects of one poison. In more modern times, and more particularly by Mr. Hunter, a distinction was attempted to be drawn, derived from the effects of mercury. When a disease was cured without the administration of mercury, it was considered not to be syphilitic; and those diseases resulting from sexual intercourse, which disappeared under the influence of mercury, were considered to be syphilitic; thus was drawn the criterion of the syphilitic or nonsyphilitic cases by that circumstance.

Mr. Carmichael, of Dublin, who is surgeon to a hospital in that
city where a great number of patients, labouring under this disease, are received, has published a work containing many good observations, and very excellent practical rules for the treatment of this disease. In this work he has advocated the plurality of poisons. The result of his researches has led him to believe that there are more poisons than one. He has attempted to show that each particular kind of primary ulcer is attended with its own peculiar set of secondary symptoms; he has, therefore, collected in a set the primary symptoms which belong to one; and in a separate set those which belong to another. He has thus established, in his opinion, four distinct kinds of disease, which he considers to be the result of as many distinct poisons. I am fully aware that many of the distinctions which Mr. Carmichael has pointed out are founded in nature; and if you read his book, and consider the subject, you will recognise the justness of many of his remarks. I do not, however, find that the combination of symptoms which he has noticed as constituting the differences, are so constant and so invariable as to lead me to the same conclusion he has arrived at, namely, that there are four different poisons. I find that the particular kinds of appearances are more mixed together than he is willing to admit; that the peculiar symptoms are not met with so distinctly as he has described; so that at present I cannot go along with him in the idea of adopting these four kinds. At the same time, I recommend strongly to you the perusal of his work on the venereal disease, as being, perhaps, the best practical treatise on the subject, and certainly, in my opinion, as containing the best rules upon the first point, namely, the important one of treatment.

Now, in investigating this matter of the unity or plurality of syphilitic poisons, we come to a difficulty at the very outset, and we find that our knowledge is extremely imperfect. We do not know, in the first instance, whether one particular sore propagates its kind or not. We cannot say whether a phagedenic ulcer, for example, in a woman, would communicate a phagedenic ulcer to a man; nor indeed can we venture to assert, that the existence of ulceration
at all in the woman is necessary to the production of an ulcer in a man. So that this very first point in the natural history of the disease is at present particularly obscure. We want evidence on the subject; in fact, we are still likely to want it, for we cannot make any distinct experiments; we cannot inoculate this pox as we do small-pox. Now I had a woman in the hospital, a married woman, who had contracted the disease from her husband; and the disease in her consisted of a well-marked phagedenic sore of the nympha, which destroyed nearly one of the nymphæ. At the same time the husband was an out-patient at the hospital; he had superficial sores on the prepuce, which had not the slightest appearance of the phagedenic character, and that was the state of disease that gave it to the woman.

Dr. Fergusson, inspector of the British forces in Portugal, had occasion to see an officer who was labouring under chancres of the worst kind; the parts were highly inflamed, and there was considerable swelling, consequent on sexual intercourse four days before, and he had committed no impropriety so as to account for the bad state of the sores. Dr. Fergusson, with great difficulty, and very active antiphlogistic treatment, prevented mortification in that individual; however, he had contracted the disease from an opera dancer at the Lisbon theatre, who went on infecting others and dancing all the time, apparently as if nothing had been the matter with her.

Mr. Evans, surgeon to some of the British forces, who has published a work on ulcers of the genitals, was present at the inspection of some of the public women in France, who were obliged to undergo examination by order of the police. In some instances he saw more than a hundred cases, and they presented very little disease indeed; what existed was merely a slight discharge and excoriation; at the same time the British soldiers, who had had intercourse with them, exhibited numerous instances of disease of the ordinary kind, which they only could have contracted from those very individuals. Again: it has happened in military and in civil life, that different individuals have had intercourse with one and the same woman, and it has been found that
one has contracted gonorrhœa, another a sore on the prepuce, whilst a third has escaped without any disease at all. We are, therefore, much in the dark respecting that primary point in the investigation of the disease. We do not really know whether one particular form of the disease propagates the same form in other individuals; we are ignorant of the particular circumstances under which each particular form arises.

Under this uncertainty, it has been the opinion of many, that the diversities exhibited by the various symptoms of syphilis, have their origin in circumstances belonging to the constitution of the individuals in whom they occur; that the particular characters of the disease in different individuals arise from differences in the constitution—differences in the state of health at the time when the disease is contracted—differences in the treatment—differences in the management, both locally and generally. In favour of this view, there is a remarkable circumstance which has been mentioned by Dr. Fergusson. He has given a short paper on the state of the venereal disease in Portugal;—it is published in the fourth volume of the Medical and Chirurgical Transactions. He says that the venereal disease in Portugal is extremely mild; that the natives of that country are in the habit of treating it by vegetable decoctions and low diet; that they suffer little from it; that it seldom produces serious symptoms; that when it goes into a constitutional form, it wears itself out under this treatment, not interfering materially with the health. Thus he considers that the disease among the Portuguese has lost its virulent character; but he says that the British troops and officers had the venereal disease in that country with the utmost severity; that, in fact, a greater number of instances of loss of the penis occurred among them, in a short time, than he supposed could be presented by all the hospitals of the country for a number of years. Yet the disease had arisen from the infection of the mild disease that I have just mentioned. The secondary symptoms were of the most severe kind, and extremely intractable.

If we look at cases of syphilis collectively, we should say that, although it is a disease of an inflammatory character, it is rather
chronic than acute; that the inflammation is not high—not rapid in its progress—not attended with serious constitutional disturbance; yet particular symptoms, of high inflammatory action, often show themselves, attended frequently with well marked fever.

Respecting the natural course and terminations of this disease, the most erroneous opinions have prevailed, even until quite modern times. It has been represented that syphilis is regularly destructive in its nature; that it destroys by ulceration the particular organ in which it is seated; that it proceeds from one part to another with unrelenting fury, according to the descriptions of some, and that in fact its ravages can only be controlled by mercury; that if mercury be not employed, it certainly proceeds to the destruction of the individual in whom it takes place. Such is the common picture given of syphilis. This, in fact, was the general opinion entertained of the nature of the disease, at the time when Mr. Abernethy published his observations on diseases resembling venereal; and, before he published that treatise, he took the pains of applying to several of the most eminent surgeons in London, to ascertain their opinions upon the subject. Amongst that number were Mr. Cline and Mr. John Pearson,—two gentlemen in whose experience and judgment the public placed the greatest confidence. Now, all those to whom he applied were unanimous in their opinion, that the action of syphilis was regularly progressive; that it destroyed the parts in which it was seated; that it proceeded from part to part, destroying as it went, until it proved fatal to the individual, unless timely stopped by mercury; and that mercury was the only means by which its ravages could be put an end to. Now the experience of the last few years has sufficed entirely to overthrow this generally received notion. It has since been made out very clearly, that every symptom of syphilis can be removed without mercury, that there is not a single symptom of the disease which may not, if left entirely to itself, come to a natural conclusion—wear itself out—without destroying the individual. Indeed, so great has been the revolution of opinion on this subject, that some persons, and those of considerable experience and judgment, have adopted the
opinion that the mercury, which is used for the primary, is the source of a great part of the secondary symptoms; and they have proscribed the use of it entirely from their practice. The former, however, I should mention to you, had been a generally prevailing opinion. It was entertained by Astruc, it was entertained by Hunter, and it is the basis on which all the reasonings in his work on the venereal disease proceeds. It was entertained by Mr. Abernethy, adopted by him from Mr. Hunter, and it was the foundation of those opinions which Mr. Abernethy has promulgated, and the basis of the opinions he, from time to time, delivered on this point. Now the once very extensive prevalence of this completely erroneous notion, and the firm faith with which it was held, are calculated, in my opinion, to teach us a very salutary lesson, that of examining for ourselves generally received doctrines; that of placing very little confidence in the opinions of the greatest names, when they relate merely to matters of opinion. Inasmuch as this notion of the progressively destructive nature of syphilis, except cured by mercury, has been entirely renounced—of course the various notions built on that opinion respecting the nature of syphilis, and the diseases resembling it, may be all set aside, and completely discarded from the surgical vocabulary. A variety of words that were found in the writings of those persons, such as *lues syphilis*, *lues syphiloides*, *psuedo-syphilis*—all these are expressions which have no clear meaning, but are expressions found in the earlier writers, upon the erroneous notion I have stated; we may therefore discard them entirely; they have no other effect, in my opinion, than that of increasing the perplexity of a subject, which of itself is sufficiently difficult.

The most important feature in the natural history of syphilis, is the progress of the complaint from one part of the body to another; the succession of symptoms it shows in successive organs and textures; the frequent renewal of the disease in the same organs or textures, after it has apparently ceased. Some forms of the disease are attended with considerable suffering, great local suffering, and considerable constitutional disturbance. When we
find that these symptoms are capable of showing themselves, from
time to time, in different parts; when we find the disease come
on again and again in the same part; when we find that those af-
fections require, as they frequently do, the employment of vi-
gorous and active means of treatment, which exert powerful in-
fluences on the animal economy, we cannot wonder that the con-
stitution is frequently enfeebled by the disease, and that in some
cases patients ultimately sink under it. In this point of view, the
nature of syphilis is sufficiently serious, although not so destruc-
tive as was formerly supposed. I may observe, however, that the
description I have now given applies to only a very small propor-
tion of cases out of the whole number of syphilitic attacks. It is
only in a very few instances that such obstinate relapses take
place, and the instances are extremely few indeed in which the
disease proves fatal in this way.

With respect to the treatment of syphilis, considered gene-

erally, I have already mentioned to you the common notion of
mercury being the only means by which it was supposed possible
to control or arrest the progress of the disease; and this opi-

ton was very generally held in the profession, from the time
I have mentioned to you as being the supposed period of the
origin of syphilis, to within the last few years. It should be
observed, however, that when we come to inquire minutely into
the matter historically, we find that there were always some
persons who had doubts on the subject; that this opinion, although
so general as to have swayed the profession, was not absolutely
universal. It was found that mercury itself, in many instances,
produced prejudicial effects; that, in many cases, diseases sup-
posed to have been cured by mercury came on again, and thus the
remedy appeared to be imperfect. Hence surgeons, at all periods,
since the disease has been well known, have turned their attention
to the discovery of other means by which the disease might be
more effectually controlled. Thus, from time to time, various
other articles have been introduced as remedies, and cases have
been published, in which those articles, various as they are in
their nature, are said to have produced the desired effect of curing the disease. Now, according to that prevalent notion of mercury being the only cure for the disease, it was said of cures stated to have been performed by the use of sarsaparilla, opium, and nitric acid, that those patients got well, because it was not the venereal disease. We can have no doubt that those cases which are said to have been cured in this way, were just as truly syphilitic cases as others; that those cases which were supposed to have been inaccurately reported, and said not to be venereal, were really syphilitic, and were cured by those means. The clearest evidence, however, on the subject respecting this point, that mercury is not necessary to the cure of the disease, has been offered principally by the investigations of the late Mr. Rose, a surgeon of St. George's Hospital. Having frequent occasion to treat venereal disease, in consequence of being surgeon to one of the regiments of guards, and happening to turn his attention to it, he found a great difficulty in coming to any clear notion as to the fact of this dogma respecting mercury being absolutely necessary to arrest the progress of, and to cure the disease. Having conceived some doubts, he determined to put the point to the test. He had the charge of the Coldstream regiment of guards, and he determined to try the point in that regiment. They were stationed in London, and consequently had intercourse with all the lowest prostitutes of the town; they therefore afforded him an ample number of cases. He determined to treat all the primary sores in that regiment by the common antiphlogistic means, and not to employ mercury in one single case of them. Let them be of the character denoting the particular nature of the venereal disease, or of any other character, he determined they should be treated without any mercury. There is a paper in the eighth volume of the Medical and Chirurgical Transactions, containing the result of his experience in this way; and after having followed this plan, for a space of, I think, above two years, he found that all primary syphilitic symptoms whatever could be cured without the employment of mercury. Whether it was an indurated chancre, or a superficial
sore; whatever it was, he found that the ordinary antiphlogistic means, simple local applications, rest, and low diet, were sufficient to conduct those cases to cures; and that, in fact, for that length of time, he employed no mercury whatever. Secondly, in the treatment of the primary symptoms of syphilitic affections, he says that in some instances they were not longer than if mercury had been employed. He states, that perhaps there was a greater number of secondary affections than if mercury had been employed; but he says, those secondary symptoms were always mild, and that they very speedily gave way to simple means. Thus he established, on the clearest evidence, that mercury is not necessary. He completely overturned the notion of mercury being required, and shewed that the disease did not possess that supposed destructive character to which I alluded; and I am of opinion that this is the most important step that has been made towards understanding the real nature of the disease since it was first known; and I should place the fact that has thus been established, first by Mr. Rose, in point of value, far beyond any of the speculations or views contained in the work of Mr. Hunter on the venereal disease.

In consequence of the paper written by Mr. Rose, the non-mercurial treatment of the venereal disease has been very extensively tried in the British army, and registers have been kept of the results of such treatment; so that, I believe, with the Army Medical Board, there are now registers shewing the results of the treatment of venereal diseases in many thousands of cases, both with and without mercury, and thus affording a very ample means of comparing the value of those sorts of general treatment; and the result of the non-mercurial treatment very satisfactorily confirms the conclusion at which Mr. Rose arrived; namely, that mercury, although it might facilitate the cure under certain circumstances, is not absolutely necessary to be employed. In other countries, as well as in this, similar investigations have been made, and with similar results; and the consequence of these investigations has been certainly a great revolution of opinion on the sub-
Mercury not absolutely necessary.

ject, and a corresponding change of practice. In consequence of this alteration of opinion, persons who have venereal diseases, are now no longer doomed to go through those long and very severe courses of mercury to which they were subjected, when mercury was supposed to be a specific, and absolutely necessary for the cure of the disease. In a great many forms of venereal disease the employment of mercury is almost entirely abandoned; and in those cases in which it is still given, it is used more moderately. Some have even gone farther; and I may mention that Dr. John Thomson, the present teacher of medicine in Edinburgh—a person whose medical learning and experience, and judgment, need no commendation of mine—has long adopted the non-mercurial treatment of syphilis; and, for a considerable number of years—I believe I may say, has entirely discarded mercury, both for primary and secondary affections of all kinds; administering mercury in no form of venereal disease; and he considers that the patients recover much better without it. He is of opinion that many of the affections, regarded as the secondary symptoms of syphilis, especially the more aggravated forms of them, are owing to the use of mercury, an opinion in which I do not altogether concur; nor can I agree with him in discarding mercury from our treatment of syphilis altogether. I have seen so many instances in which the efficacy of the remedy has been undoubted; I have seen so many cases in which the disease might get well without mercury, but in which it has got better, more quickly, and with less effect on the constitution, than without mercury, that though I fully agree in the modified employment of mercury, and in the propriety of using it more sparingly, I cannot go so far as to discard it from practice altogether. I still think it a valuable remedy, capable of being very useful in the treatment of venereal diseases.

Mercury, gentlemen, is employed in the treatment of syphilis, either simply, as a local application, or as a remedy capable of producing a powerful influence on the system at large; and, through that influence, of arresting the progress of, and ultimately
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curing the disease. Mercury, in its metallic form, is inert; it produces no effect on the human body. It may be swallowed in any quantity, and will do neither good nor harm. It exerts no influence except when it is combined with oxygen, or with some acid. Of the local applications, perhaps, the most common is what we call the black wash: I believe rather an unchemical combination of calomel with lime-water; the proportions are fifteen grains of calomel to an ounce of lime-water. This is used as a lotion, by dipping lint into it, and applying it to the venereal sores; and, perhaps, it is one of the best modes, if not the best, of applying mercury locally. There is another wash, called the yellow wash; that is, a combination of the oxymuriate of mercury, corrosive sublimate, with lime water; the proportions are a grain and a half or two grains of the oxymuriate to the ounce of lime water. This is used in the same way. We have also the mercurial ointment, which, however, is not very frequently applied to venereal sores. We have the red precipitate ointment, the unguentum hydrargyri precipitatum of the Pharmacopoeia, which is more commonly used. We have also the unguentum hydrargyri nitratum, which also is not very commonly applied to venereal sores. Another mode in which mercury is applied locally, is that of fumigation; and, for this purpose, sulphuret of mercury is employed, the hydrargyri sulphuretum rubrum, cinnabar, is the drug commonly used. The mode of employing mercury in this way is this. You raise the temperature of a piece of iron to that of a red heat, and throw a certain portion of the cinnabar upon it, generally half a drachm, or a drachm. You then place over the iron and cinnabar a copper funnel, which terminates in a pipe through which the fumes of the cinnabar arise; and in this way you may direct the fumes to the ulcerated surface. The cinnabar is volatilised by the heat, and rises in a white smoke. A grey pellicle is gradually formed on the ulcerated surface exposed to the fumes.

When we endeavour to produce a mercurial effect on the constitution in this disease, we can accomplish it, generally, either by
applying certain forms of the mercury to the surface of the body, or by administering it internally. The most common mode of applying it externally is by that of friction, that is, rubbing on the inside of the thighs before the fire, for a space of about twenty or thirty minutes every night, a drachm of the mercurial ointment. Sometimes half a drachm only is used; sometimes a drachm is employed twice in the course of a day. When the rubbing is discontinued, the chief part of the ointment will be found to have disappeared; it may be said to have been rubbed in; the patient should not wipe off what may be adherent to the skin, but put on a pair of flannel drawers, and continue to wear them during the process. If pimples be brought out by the rubbing of the ointment on the inside of the thighs, the patient must vary the place of application, by rubbing it on the outside or anterior part of the thighs; and, inasmuch as a certain portion of it adheres to and clogs upon the skin, it is necessary to wash the part clean with soap and water every third night, before rubbing in any more.

Now when the mercurial ointment is applied in this way to the external parts of the body, it is capable of producing the same effect on the system, as is produced when the remedy is taken inwardly in other forms. By the action of friction, the mercurial ointment is made to enter the absorbent vessels, and thus it is introduced into the system. The simple application of the ointment to the skin, is not sufficient; if you merely do this, the desired effect is not produced; the mechanical art of rubbing is necessary to accomplish the purpose. A principal advantage of employing mercury in this way is, that it does not produce those unfavourable effects on the alimentary canal, which often follow the internal use of mercury; or if it do produce any inconvenience, it is in a much less degree. Hence friction was formerly the general mode in which mercury was employed for the purpose of affecting the system. The troublesome nature of the proceeding has, perhaps, led in some measure to its disuse, so that it is not so common now as the internal administration.

Mercury may be introduced into the system through the skin
by general fumigation of the whole surface of the body. If the naked body be placed in a square box, at the top of which is an opening for the head to pass out, and if some of the preparations of mercury be volatilised by means of a hot iron placed in the bottom of the box, the body becomes exposed to the volatilised mercurial fumes, and in this way a very speedy effect on the system may be produced. For this purpose the hydrargyri oxyd cinnerum may be thrown upon the hot iron; or the sulphuret, or cinnabar, may be employed. The cinnabar, however, is rather too powerful to be employed in this extensive way. I may observe to you, that this mode of using mercury will quickly produce the intended effect. The cinnabar fumigation is not an uncommon mode of applying the mercury to ulcerations of the throat, and I have many times seen salivation produced by it.

Of the forms of mercury which are administered internally, Pil. Hyd. perhaps the safest, and altogether the best, is the pilula hydrargyri, or, as it is called from its colour, the blue pill; it consists of mercury triturated with confection of roses and powder of liquorice. This combination is given in doses, ordinarily, of four or five grains, sometimes, however, as large as ten grains, and these are given twice or three times in the course of the four-and-twenty hours.

Another mode, and a very common one, of administering mercury internally, is in the form of calomel—the hydrargyri submu-riatis of the London Pharmacopoeia; one or two, sometimes even three or four grains in this form of the remedy, are administered two, three, or four times in the four-and-twenty hours. Now as calomel very frequently acts as a purgative, it is sometimes necessary, when administered for the purpose of influencing the system, to combine opium with it, to prevent its action on the bowels. A third of a grain, or half a grain of opium, may be combined with each dose of the calomel for this purpose, and frequently it is necessary to combine opium in the same manner with the blue pill, for although that does not so commonly act on the bowels, yet it sometimes does.
Hydrargyrus cum creta, formed by triturating mercury with chalk, is a mild preparation of mercury. It is considerably less active than either of the two preceding forms, and therefore more mild. It is employed when we wish to administer mercury to children, or to individuals in whom other forms of mercury affect the bowels, or produce other bad effects; it is given in doses of from five to ten grains, and may be repeated in the course of the four-and-twenty hours. This is a form of the remedy, however, which is not employed when we want to act powerfully on the system, or to do so in a short time.

The oxymuriate of mercury, or corrosive sublimate, is another form that is employed in certain cases, but it is very powerful, and, indeed, even in small doses, it is a poisonous preparation. It has, however, been frequently used, and is so still, in minute doses, in cases of syphilis. On account of its very active properties, it must be used in minute doses, and its effects must be cautiously observed. We give sometimes the sixteenth, or the eighth, or the fourth of a grain, two or three times a day; seldom, if ever, however, exceeding the quantity of one grain in twenty-four hours. This remedy was introduced into general practice, in consequence of the high encomiums passed on it by Van Swieten, who employed it in Vienna, and hence it has come to be very commonly used on the continent, much more so, indeed, than here. When I was in Paris, about ten years ago, I found that all the cases, whether of primary or secondary symptoms, at the Venereal Hospital, were treated by the corrosive sublimate in solution; one grain of the corrosive sublimate was used to an ounce of distilled water, and the quantity given was half a grain in the course of the day—rather a large allowance. The remedy was carried round when the attendant visited his patients, and it was poured out in his presence, and drank before him, so that the effect of it in this way, at least, was ascertained. But the general mode of administering it is in milk, or in thin mucilage. The liquor hydrargyri oxymuriatis of the London Pharmacopoeia, contains half a grain of the corrosive sublimate to an ounce of distilled water,
so that one drachm of the solution contains one-sixteenth of a
grain of the corrosive sublimate. A grain of the corrosive subli-
mate may be dissolved in an ounce of the tincture of bark, or
tincture of rhubarb, and then a tea-spoonful, containing the eighth
of a grain, may be taken three times a day. The red oxyde of
mercury, formerly called the mercurialis calcinatus, may be taken
in doses of a grain twice a day, or sometimes in doses of a grain
and a half, when it is intended to affect the system. This is
rather a powerful form of the remedy, and very apt to affect the
bowels, and as it has no particular advantage attending its ad-
ministration, it is pretty nearly discarded from practice in this
country.

Now, mercury, like other medicines, affects different individuals
in a very different manner, so that we cannot mention any definite
dose that can be employed at all times. There are some persons
in whom the smallest quantity, one or two grains of the blue pill,
will produce salivation; there are others in whom you may rub in
mercury, and to whom you may give calomel and blue pill in very
large doses, without affecting the system. Hence it is necessary
to proceed cautiously, and to watch the effect of the remedy. You
cannot safely prescribe a dose, and let the patient go on repeating
it for two or three days, because at the expiration of that period,
you will find, probably, that a profuse salivation has taken place.
You should inquire whether mercury, on its having been used at
any former time, had speedily affected the bowels or produced
salivation; and if it had, then you must give it still more cautiously.
Frequently, when we wish to affect the system rapidly, in order to
put a stop to complaints that are spreading destructively, we
employ the remedy, both by means of friction, and internally; that
is, we administer the blue pill, and rub in the ointment, until we
produce a certain effect; and then, perhaps, the internal adminis-
tration, or the external application alone, will keep up the action
to the requisite extent. When mercury is given in moderate
doses, it generally purges; and small doses of mercury, repeated
from time to time, are given in consequence, to alter the state of
the secretions in the alimentary canal; but it is not the purgative effect, nor the influence which it is thus capable of exerting on the secretions of the alimentary canal, that checks the progress of venereal disease. Mercury must be given in larger quantities for this. It must be repeated; its effects must often be continued for a considerable length of time, in order to bring about that change of the system, by which the progress of venereal disease is arrested. In truth, the action of the remedy as a purgative interferes with its influence on the system, and prevents the check which it is intended to give to venereal disease.

Mercury produces very considerable and very powerful effects on the animal economy. It generally increases the quickness of the pulse; and sometimes it produces a slight degree of what we may call feverishness. It augments some of the secretions, particularly that of the salivary glands; frequently those of the kidneys, and of the skin. And it will not only augment the secretion of the skin, but that secretion may become actually impregnated with the metal; so that articles of gold or silver that are worn near the person, undergo a partial alteration of the surface in consequence of it. A gold watch, for instance, may be turned quite white. The mercury produces a peculiar effect on the mouth. In the first place, it causes an unpleasant metallic, or coppery, taste, of which persons are particularly sensible in the morning; at the same time it produces a foetor of the breath, so that persons who are taking mercury, and do not wish the fact should be known, must be careful not to approach too near those from whom they wish to conceal it. It then produces swelling, sponginess, inflammation, and a tender state of the gums, with looseness, and a very painful condition of the teeth, so that a person is unable to bite not only any hard substance, but even any thing that approaches at all to a state of solidity. The mucous covering of the mouth generally undergoes the same change as the gums. The mouth swells, and becomes very painful, and if the action of the remedy be continued, it causes ulceration of the mucous surface, a superficial abrasion, and the surface
ON THE VENEREAL DISEASE.

thus exposed assumes a greyish, or ash colour, as if it were covered by a superficial slough. Nay, further, in some individuals, portions of the mucous membrane actually slough, and slough too, sometimes, to a considerable depth. In conjunction with these effects of the mouth, there is an increased secretion of the salivary glands; and this constitutes salivation, or ptyalism. In this condition a person will spit a pint, or two, three, or four pints, in the four-and-twenty hours. The fluid which is thus discharged, is a ropy, slimy fluid, consisting principally of a mixture of the secretions of the salivary glands, with a mucous discharge from the mucous membrane. The effect which is thus produced upon the mouth, is considered a criterion of the general influence upon the system of the remedy on which we place our reliance for arresting and curing syphilis, and I believe it may very safely be regarded in that light. Often, so long as no alteration is produced on the state of the mouth, we do not find the curative effect take place; and we generally find the curative influence proceed in proportion to the local effect observed in the mouth; we cannot, however, say that this is absolutely true in all cases. Other effects may be produced by the remedy, though this peculiar influence on the mouth may not take place to the extent I have mentioned; so that there are some cases in which syphilitic symptoms disappear, although mercury has not produced the usual effect on the mouth.

Now, at the time these various effects are produced by mercury on the system, we see a beneficial influence obviously produced on the syphilitic symptoms. Venereal ulceration is put a stop to, the restorative processes commence, and the ulceration heals. Lymph, which has been diffused from the iris into the anterior chamber, is absorbed; the swellings of the periosteum are dispersed; matter is frequently removed from buboes; pains of the bones and joints disappear; and eruptions of the skin fade away. Such are the changes we observe when the mercury acts decidedly on the disease. Now, we really find it difficult to reduce these several manifestations of the mercurial influence over syphilis to any one general principle. Indeed, when we survey them al-
together, some of them seem contradictory. We observe that mercury has a powerful influence in producing absorption; that it will produce absorption of lymph from the iris, that it will produce absorption of the interstitial deposition which constitutes a node in the periosteum, and that it will produce absorption of matter from a bubo. In all these cases, we see its power in increasing the action of the absorbent vessels. But, on the other hand, we observe, that it arrests the action of those vessels in ulcers; that it puts a stop to that process of absorption which occasions the ulceration, and that it produces the deposition of the new matter which is necessary for repairing the breach produced by such ulceration.

It has been said, that mercury cures syphilis by its specific power; that is, that the mercury is a specific for the removal of the disease; implying that its administration would invariably put a stop to the disease. If your inquiry be, What is the specific power of mercury? the answer would be, To cure syphilis; so that here we are reasoning in a circle. Mr. Hunter says, that mercury produces irritation in the system, which irritation supersedes or destroys the irritation caused by the venereal disease. Now, for my own part, I cannot discern any thing more in that statement, than that mercury cures the pox. I believe we have not yet got much further than this in our attempts at an explanation. In order to produce that beneficial influence of mercury which we wish in cases of syphilis, it is necessary to give the remedy repeatedly, and to persevere in the employment of it for a considerable length of time; it is not one or two doses that will produce any effect; we must give the remedy several times, perhaps, in the course of the four-and-twenty hours, and we must persist in the use of it day after day, perhaps week after week, and even sometimes for months, before the requisite effect will be produced. We cannot say that the remedy is to be given repeatedly, exactly in the same doses during the whole of this time; we must watch the effects produced, and we shall find that we should sometimes diminish, and sometimes increase, the dose;
sometimes leave it off, and then resume the use of it again, our object being to produce a certain effect on the system, and to keep that up for a certain length of time. When a person employs mercury in this way in the venereal disease, or indeed in any other complaint, the patient is said to go through a course of mercury; it is called a mercurial course.

Now there are certain rules of diet and management to be observed, in order to ensure the favourable action of the remedy on the system. In the first place, we find that the effect of mercury is increased by warmth, and by keeping the individual in a regulated temperature. Hence it used to be considered a rule that the patient should remain in a warm room; that he should not go out and expose himself to the air while he was going through a course of mercury. There is so far a reason for this, that free exposure to the cold air lessens the effect of the mercury. If you wish then to produce the effect of mercury readily, and to its highest extent, you should keep the patient in a regulated temperature, and with warm clothing. We do not desire strictly to confine the patient to his chamber during a mercurial course—it is not necessary; but, as a matter of precaution, he should avoid cold and damp; we ought not to allow him to go out at night, but keep him warm and well clothed; and, under certain circumstances, he should be confined to his room, but this confinement is not to be considered as a general rule. The diet of the patient should consist of milk, bread, and other farinaceous articles. When the mouth begins to be affected, the patient is unable to take any food of a solid kind, therefore the articles I have mentioned must, almost of necessity, constitute the diet; there is, too, a feverish state of the system produced sometimes, in which animal food and fermented liquors would be very improper. On account of the disposition of the mercury, whether employed externally, or internally, to affect the bowels, it is necessary to avoid certain kinds of food that would favour that tendency; thus, a patient should not take acids, nor eat salads, pickles, nor unripe fruit, nor undressed vegetables. There are some instances in which mercury is administered to
patients who are already in a considerably reduced state of health, and in whom it is expedient to sustain the general strength of the system, at the same time that we avail ourselves of the power of mercury to check the specific disease. Under such circumstances it is necessary to give the patient a nutritious, and rather a generous diet at the time of using the mercury; therefore good soups, strong broth, some small quantity of fermented liquors, good porter or ale, or even wine and water, may occasionally be allowed under these circumstances.

Salivation.

The effect of mercury often proceeds further than we wish; and, indeed, in many instances, the remedy acts prejudicially on the system. It produces effects which are in themselves almost a disease, sometimes we may say disease of a serious kind, and such as to require prompt treatment. Sometimes the remedy acts very seriously on the mouth, producing excessive salivation; and I do not know a more deplorable condition than that of an individual in whom this excessive ptyalism takes place. The tongue becomes swollen, excessively sore, excoriated on the surface and edges, and it presses against the teeth on each side, so that indentations of the teeth are observed on the margins of the organ. Sometimes it is so much swollen that it actually protrudes from the mouth. The nose and the lips are enormously swelled, and the whole face and head sometimes participate in the tumefaction. The mucous membrane of the lips, cheeks, and throat, becomes inflamed, excoriated, sloughy, and most excessively tender. There is at the same time a constant and profuse fetid discharge of saliva from the mouth. This continues to run night and day, and almost prevents the patient from taking his rest. The quantity frequently exceeds what I have already mentioned: a pint or a quart of saliva will flow from the mouth in a comparatively short time. The ulceration of the gums, the looseness, and painful state of the teeth in their sockets, become more considerable. The gums slough, the alveoli perish, and the teeth themselves fall out. I recollect seeing a gentleman who came from the East Indies, who had been in the army at Rangoon, and who had there contracted a fever, for which it was ne-
cessary to give him mercury very freely. Under the employment of this medicine his head swelled, and salivation came on. He embarked for England with very little appearance of his living to reach this country. He, however, survived the voyage, and I saw him when he arrived in town, at which time his lips, gums, and all parts thereabouts, were enormously swelled. He could not open his mouth at all; and there was a quantity of the most horrible discharge continually flowing from his mouth that I ever beheld; indeed it was so great, that he scented that part of the ship in which he resided to such an extent, that nobody could go near it during the voyage. When I came to examine the mouth, I found that the teeth were all loose and shaking, and, in fact, that the whole thirty-two would come out, sixteen from each jaw; and then the whole alveolar processes came away! So that he lost the whole of his teeth, and the alveolar processes; and besides that, in consequence of the sloughing, the insides of the cheeks became adherent to the surfaces of the gums, so that he had but a very limited power remaining of moving the lower jaw.

Salivation, if properly managed, is not at all dangerous to life, though sometimes it almost entirely prevents a person from taking food during a short period, and now and then impedes articulation. Now, unfortunately, when excessive salivation does occur, there is no direct or speedy remedy for this very painful and distressing state*. It will require two, three, or four weeks for the affection gradually to subside, and we cannot, perhaps, very materially accelerate the disappearance of the symptoms. I have mentioned to you that a warm and uniform temperature promotes the action of mercury; in the same way free exposure to cold diminishes it; so that when a person labours under that state, he ought to go out in the air without any covering about the face. People wrap themselves up, and think it necessary to tie up the mouth in order to exclude the air. On the contrary, they should go out and keep themselves cool. Saline purgatives should be given to keep the

* A strong solution of catechu and kino, equal parts, employed as a gargle very frequently, will most effectually restrain the salivation.—Ed.
bowels open. When mercury acts on the bowels, its action is less on the mouth. Locally the patient may employ lotions of alum, or the tincture of myrrh in the infusion of roses, in order to cleanse the mouth from those offensive secretions, and keep it in some degree comfortable. When the swelling has a little subsided, so that we can observe the extensive masses of sloughs called superficial sloughs, of the mucous membrane, we shall find that the painful state of those sloughs will be greatly diminished by touching them with the linimentum æruginis of the London pharmacopœia. This is a very active remedy; it is of a poisonous nature, and therefore requires cautious use. Roll a piece of lint round a probe, dip it into the liniment, and thoroughly soak the parts I have mentioned with it; let it remain for a minute or two upon them, and then let the patient take some lukewarm water, and wash it out of his mouth; for if a small portion of this liniment were introduced into the stomach, it would produce rather a serious effect on that organ. A pretty strong solution of the nitrate of silver may be employed for the same purpose. In this way the effects produced by excessive salivation, will gradually subside, but I do not know of any mode of putting a stop to them quickly.

Mercury very frequently acts unfavourably on the bowels, producing pain, griping, purging, tenesmus, and mucous evacuations; that is, it produces generally a set of dysenteric symptoms. In order to put a stop to those symptoms, you must discontinue for a time the administration of the remedy, and give the patient opium, the tinctura opii, in chalk mixture. A dose of rhubarb, and some of the pulvis cretæ cum opio, will diminish the irritation of the bowels, and relieve the patient. When you resume the use of mercury, you must cautiously administer opium with it, to prevent these effects. Very frequently, by the proper combination of opium with it, you preclude these effects on the bowels, although, if you give mercury simply, the same symptoms would recur.

Sometimes mercury produces a peculiar inflammation of the skin, which has been called by Dr. Bateman eczema mercuriale—ε-κ-ζ-ε-μ-α—a Greek word, I believe, meaning to boil over.
The skin becomes inflamed in patches, and very minute vesicles form upon it, as thickly set together as possible. These, at first, are hardly visible, as their contents are transparent; but they burst, and discharge a matter which encrusts on the surface of the skin, the parts themselves remaining raw and tender, after the discharge has taken place. Considerable quantities of matter thus exude from the skin, and becoming encrusted, renders the skin hard and uncomfortable. Fresh patches of the skin become inflamed, and go through the same process. Thus, frequently, this peculiar inflammation of the skin—this eczema, or what some call erythema mercuriale, extends over the whole surface of the body. The affection is a painful one, for it is attended with considerable inflammation of the skin; and the dry crusts which are formed on the surface—the exudation of matter—and the stiff state of the linen produced by this discharge, which is usually of a fcetid odour, renders the patient subject to irritation over the whole surface of the body. Now this goes through a certain course; it gradually subsides, and comes to an end, but it is productive of very great pain and distress, and even of high constitutional irritation, during its continuance. Its occurrence seems owing to some peculiarity in the constitution of the individual, for it will take place without a large quantity of mercury having been employed; it will take place either under the use of the remedy by friction, or by its use internally. Sometimes it takes place on the part where the mercury has been rubbed in, and thence extends over the surface of the body; but it will be equally produced by its internal employment even in moderate doses. When a person is subject to it, it becomes really so serious as to preclude the use of the remedy, unless it be imperiously required. No person would think of using mercury in an individual who had been the subject of erythema mercuriale, except under the most urgent circumstances.

This affection admits of little more than palliative treatment. Soothing and mild local applications should be employed. The surface may be washed, and gently cleaned by means of emollient, or slightly mucilaginous, fluids; milk and water, the decoction of
linseed, and thin gruel. The parts, which are particularly sore and inflamed, may be covered with a bread-and-water poultice. Mild, unctuous applications may be employed, after the inflammatory process has gone off, to detach the crusts that are formed on the body. Aperient medicines, of course, should be given; slight salines, with antimony, mild sudorific remedies, and the complaint, under such treatment, will slowly decline.

Mercury frequently seems to act as a kind of poison on the system. It will produce a quickness and feeble state of the pulse, it will cause loss of flesh, loss of appetite, sallowness of countenance, restlessness at night—in fact, a state a good deal like what we should call hectic fever. Sometimes it goes further than this, and has a peculiar influence in disturbing the action of the heart and respiratory organs. It causes a sense of oppression about the precordia, an irregular action of the heart, a slow and frequently intermittent pulse, general coldness of the surface, a paleness and contorted state of the countenance. These symptoms were particularly described by the late Mr. Pearson, who has devoted a chapter to them—chapter the twelfth, in his work entitled "Observations on some Articles in the Materia Medica for the Treatment of Syphilis." He calls this state erethismus:—erethismus is a Greek word, something equivalent to irritation. He says, that at the Lock Hospital, of which he was surgeon, he had observed that, occasionally persons died suddenly, without having been previously ill, or without his being able to ascribe the death to any particular cause. He was hence led to pay particular attention to persons who were under a mercurial course; and he found that symptoms such as I have described were occasionally produced; and that, in this depressed condition of the circulation and of the general powers, a slight degree of exertion, such as walking across the ward, would suddenly prove fatal. I myself once saw a very marked instance of this kind. It occurred in the person of a physician, who is well known by his works—I mean the late Dr. Bate-man. He took mercury in consequence of an amaurotic affection; he was of a delicate nature, and this peculiar effect upon the heart
and respiratory organs was produced in him in a very extensive and alarming degree; so much so, indeed, as to bring him to a state of great danger. Although the mercury had not acted seriously on the mouth, nor produced sores, the action of the heart became so irregular, and the action of the respiratory organs was so interrupted, that, for five or six weeks, his life was in the greatest danger.

Mr. Pearson observes, that the best remedies in this affection are, first, free exposure to the air; secondly, medicines of a cordial or stimulating kind, and a good generous diet, animal food, wine, and other fermented liquors. These seem obviously calculated to rouse the drooping powers of the circulating system, and the whole of the animal economy. In point of fact, he says, that such means are found to be the best calculated to remove the symptoms I have mentioned. I recollect that, in the case of Dr. Bateman, the person whom I have just mentioned, although he was very little given to the use of fermented liquors, he found it necessary to take wine, and even brandy, also jellies, and animal food even in a concentrated state. When such symptoms appear to be coming on, the exhibition of volatile alkali, with the camphor mixture, I believe to be the best remedy, and, of course, the employment of mercury is immediately to be discontinued; and supposing the patient to be in an hospital, he must be removed from the mercurial atmosphere. In the state of system produced by the action of mercury, some persons appear to be particularly disposed to rheumatic affections. Where there is peculiar rheumatic disposition, we frequently find persons complaining of pains of the joints, of the limbs, and the bones; and we do occasionally see actual swellings of the joints, which we have every reason to ascribe to the effect of the mercury. It would seem, therefore, that in those who have a disposition to rheumatism, mercury would call the affection into action; and hence the necessity of weighing all the effects of the remedy, in order to prevent prejudicial actions of this kind.

To this catalogue of evils, produced by the employment of mercury, some persons are inclined to add very considerably. In fact, among the prejudicial effects of the remedy, are enumerated, by those who are unfavourable to its use, eruptions, iritis, affections of
the nose, affections of the bones, and affections of the joints, that is, a considerable portion of those symptoms which we know as secondary symptoms of syphilis. It has been contended by those, who in modern times have been the great advocates for the treatment of syphilis without mercury, that a great portion of those symptoms ordinarily described as secondary, are really owing to the action of the remedies employed to counteract the syphilis. Now, in the first place, we may observe, that all these symptoms may be produced without the employment of mercury. We know, perfectly well, that each of them is seen in individuals who have taken no mercury at all. We have, therefore, clear evidence that all these effects may be produced by the disease. We have not the same evidence that they may be produced, on the contrary, by the employment of mercury. Mercury is given in many cases, besides those of syphilis: it is given to a very considerable extent in other cases; but in no instance, where it is given in other diseases, do we find it produce eruptions, like syphilitic eruptions; in no such instance do we find it produce iritis, swelling of the nose, or of the bones, or of the periosteum. The effects, then, in question, can be produced by pox without mercury, but we have not the same evidence that they can be produced by mercury without pox. Now, it is true, that mercury and pox, acting together, may produce a something that neither would produce singly. I readily admit that the injudicious use of mercury, and the repeated employment of it in cases in which it ought not to be employed, may act prejudicially on the system, and that a perseverance in the use of it, where it exerts some of its noxious influences, may aggravate the symptoms of syphilis—may tend to make them return more easily—and may make them more difficult to cure. Thus, I think, there can be no difficulty in admitting—that the employment of mercury, under such circumstances, may increase the difficulties which belong to the disease itself. I cannot, however, myself, at present see any evidence that mercury is capable of producing these symptoms, which we are in the habit of witnessing as the effects of syphilitic poison, where no mercury has been used; and certainly there are injurious effects enough arising from mercury, without adding those
that do not belong to it. In fact, all we want is a knowledge of the truth—to know what the remedy is capable of effecting, and what it is not—to understand what advantages and what disadvantages it may produce on the system, and not to carry our notions of it beyond what is legitimate; for the remedy, undoubtedly, is a valuable one, and we might be led by incorrect notions to reject its influence in cases where it would be really of service. A consideration simply of those prejudicial effects of the remedy, would, of course, naturally lead us to restrict the employment of it to cases in which we deem it absolutely necessary, and also to endeavour to procure the effect we wish by as small a portion as can be used.

This naturally leads to two questions, first, whether a slight degree of action of the mercury on the mouth, may be considered a proof that it has produced all the effect necessary for the removal of the venereal disease, or whether a more considerable effect is necessary generally, or in particular cases? It has been much the habit in modern times to produce a sensible effect on the mouth, and then to discontinue the mercury, under a notion, that when the mouth is affected at all, the system has experienced a sufficient influence for the removal of the disease. I cannot coincide with this opinion. In a great number of instances, a slight effect of mercury on the mouth is sufficient; but there are instances in which that slight effect does not remove the symptoms, and in which, when the remedy is carried further, so as to produce a more considerable influence, the symptoms give way. In fact, I think, we never see the symptoms of syphilis yield so rapidly, and so favourably, as in certain cases where the remedy, perhaps without our wishing it, has produced a pretty profuse salivation. Under these circumstances, we may notice a sudden and rapid amelioration of the symptoms, which we are not in the habit of seeing when the mouth is affected in a slighter degree only. Another question immediately connected with the same point, is, how long the remedy should be continued? Is it sufficient to destroy the venereal character of a sore, and to produce the healthy process of restoration? Would you leave it off, then, and leave the cicatrization to form of itself?

To what extent should mercury be given?
May you discontinue the use of the mercury the moment the cicatrization is complete? or should you try to secure the patient from the occurrence of secondary symptoms, by proceeding with the employment of the remedy after that? These are important questions, and we have not, perhaps, the means of answering them satisfactorily. With respect to the first, however, it is certainly not safe to discontinue the use of the mercury before the sore is cicatrized all over. Then, secondly, is any good produced by continuing the use of the mercury after the cicatrization is complete, with a view of preventing a return of the symptoms? This is a very important question, and if you refer to the best writers on the subject, you will find but very little to assist you. Mr. Hunter's observations on this point are very confused and contradictory; sometimes, he says, you may discontinue the use of the remedy as soon as the local symptoms have disappeared; in other parts, he says, he thinks the further use of mercury will "protect the constitution," to use his own phrase: you will, in fact, get no clear evidence from him. General experience, however, has led to a belief that perseverance in the use of mercury for some time, say a week, ten days, or a fortnight after cicatrization, has a beneficial effect in protecting the constitution; so that persons, when they have used mercury to the extent I have mentioned, are not in the habit of suddenly discontinuing it, but of carrying it on for a short time after the apparent removal of the disease, under a belief that its continuance tends to prevent the recurrence of further evil.

Other remedies, besides mercury, are supposed to possess antisyphhilitic properties—powers of arresting and of curing the venereal disease. Perhaps the foremost among them is sarsaparilla—the root of sarsaparilla; and this remedy is administered in the forms of powder, extract, and simple decoction; that is, of decoction, consisting of the roots of sarsaparilla only, or of compound decoction. In the latter form, which is perhaps the most frequently administered, the sarsaparilla is combined with some other vegetable remedies; that is, guaiacum, sassafras, and mezereon. This compound decoction of sarsaparilla is nearly similar to the "Lisbon diet drink"—*decoctum lusitanicum.*
Now, the most opposite opinions have been entertained in the profession respecting the remedial properties of sarsaparilla. Cullen, in his "Materia Medica," seems to doubt whether he should give this remedy a place at all in his system:—"If I were to consult my own experience alone, (says he,) I should not give this root a place in the Materia Medica; for I have tried it in every shape, and never found it an efficacious medicine in syphilis, or any other disease." But other persons, and those of great experience, place great confidence in the virtues of sarsaparilla, and administer it very frequently, considering it as a remedy of the greatest efficacy in various forms of syphilis and other diseases*.

It appears to me, in the first place, that we cannot ascribe to sarsaparilla the same anti-syphilitic property—that is, the same power of arresting or curing the venereal disease, that experience warrants us in reposing in mercury. If we take a decided form of syphilitic disease, we do not often see that the employment of sarsaparilla alone is capable of putting a stop to the disease. The circumstances under which sarsaparilla seems to be of use are particularly where the constitution is enfeebled, either by the long continuance and the repeated attacks of the disease in various textures of the body, or by the repeated courses of mercury that are employed (and sometimes we may say, perhaps injudiciously employed) for them:—that is, in short, where the general powers of the system are considerably enfeebled—where there is loss of flesh and loss of strength; it is in these cases that sarsaparilla is of particular efficacy, although we also give it in certain forms of the disease which are of a painful and intractable kind, and where we do not deem it fit to use mercury.

Now you will naturally make the inquiry, how sarsaparilla acts—what is the mode in which it exerts an influence upon the system, and what are the properties in it which are capable of producing these beneficial effects? And I must own that it is very difficult to answer that question. A healthy person may take two or three

* I never could discover any specific property in sarsaparilla beyond that of being a good sudorific; and with this intention I give it combined with the bichloride of mercury—say half a grain per diem.
pints of the compound decoction of sarsaparilla, and experience no effect from it whatever—it seems to exert no sensible influence on the animal economy. We do, however, see that patients, under circumstances of alarming indisposition, recover, and that speedily, under the exhibition of this remedy; and therefore, although we cannot absolutely point out the mode in which the medicine operates, we are not justified in withdrawing our confidence from its powers. It is enough for us, in medical science, to know that a certain thing takes place in point of fact*. We are, in many cases, unable to distinguish the modus operandi—that is, the manner in which the beneficial influence is produced. It is rather singular in the case of sarsaparilla, that physicians have no confidence in it, and that surgeons have a great deal of faith in it; because, in general, speaking of faith in the sense in which it is adopted with respect to the efficacy of articles in the "Materia Medica," I think that of physicians rather exceeds that of surgeons; however, certainly the reverse is the case as to sarsaparilla.

Sarsaparilla is frequently given in the venereal disease in conjunction with mercury, as with blue pill, calomel, or the oxymuriate. Under such circumstances, however, we cannot be confident of the virtues of sarsaparilla, because the good we ascribe to it may possibly be accomplished by the mercury. Sarsaparilla is frequently given at the conclusion of long mercurial courses, where the patient is considerably worn out by the duration of the disease, and the unfavourable influence upon the system of the treatment that has been instituted for it. Here, perhaps, the discontinuance of the cause that kept up the disease—that is the mercury—may have as much influence in bringing the patient to a state of health, as the exhibition of the remedy in question.

Respecting the virtues of other substances supposed to be antisyphilitic—for example, the guaiacum, sassafras, opium, cicuta, mineral acids, and so on, I need say nothing at present; because, although they have been brought forward to the public with consi-

* If this prevailed, the boundary of science would be very limited indeed—this is pure empiricism and very unlike Mr. Lawrence.—Ed.
derable confidence as possessing powers over the venereal disease, general experience has shown that they are merely capable of producing slight effects under certain states incidental to the disease, just as they might in other complaints; that is, they possess no peculiar power in controlling or obviating the effects of the venereal virus; and respecting all these substances, I may refer you to the work of Mr. Pearson, which I have already alluded to, I mean his observations on the effects of various articles in the "Materia Medica" in the treatment of venereal diseases.

Now the attention of medical men has been so much attracted by what we may call the specific character of syphilis—their minds have been so much turned to those peculiar circumstances by which syphilis is distinguished from common disease, and they have directed their endeavours so much to the discovery of something that should counteract this specific effect, (that is, to find out something that should be a "specific" remedy for the disease,) that they have paid less attention than probably they ought to have done to those characters which the various forms of syphilis possess in common with other diseases. Supposing we put out of the question altogether, the notion of the specific nature—the peculiar properties of the poison which the venereal disease produces, what do we see in the various symptoms that are described as constituting syphilis? We find inflammation of various textures of the body, mortification, ulceration of various characters, interstitial deposition producing enlargements, feverish disturbance of the constitution, great sufferings, emaciation, and hectic fever. Now if we were to regard these symptoms without turning our minds to the peculiar or specific nature of the cause that produces them, we should immediately say in the early stage of the disease, during the inflammatory indisposition it exhibits, that the antiphlogistic treatment—often bloodletting, would be proper. We should employ those means which we consider capable of producing absorption of interstitial depositions: where there is great suffering, we should use soothing narcotic means; and we should employ in that stage—where the powers of the constitution are reduced—where loss of flesh has taken place—and where
there is a hectic condition, such means as are capable of restoring
the general health. These are the means we should employ, if
we regarded syphilis as inflammatory merely; and I can have no
difficulty in stating to you that such means may be employed with
as much reliance on their efficacy in syphilitic disease, as in simi-
lar affections of the system from any other cause.

Now, reduced diet is necessary for the inflammatory period of
syphilitic disease. Persons must abstain from fermented liquors
and solid animal food; they must take a mild and simple diet.
This is a point to be particularly attended to in the treatment of
the venereal disease. In some parts of the continent, as in Ger-
many, one plan they pursue, as an essential part of the treatment,

Primary sores
or chancre.

Dietetic treat-
ment.

is what they call _hunger-cure_—that is, hunger cure—cure by starv-
ation—the employment of a very reduced diet. An account has
been published of the treatment of cases in the venereal hospital
at Paris, in which the efficacy of the vegetable or reduced diet is
strikingly seen as contrasted with the employment of stimulating
or animal regimen. Of 1312 cases (including both primary and
secondary symptoms) treated in the Hôpital Val de Grace, at
Paris, from April 1825, to July 1827, some were treated with
mercury, and some without. Some had animal diet, the others
vegetable and mild diet—the _régime végétal et adoucissant_ of the
French. Putting the other treatment out of the question, the
average duration of the cases on meat diet was fifty-five days,
that of those on vegetable diet, thirty-three days. So that you
observe that the difference from the employment of a mild vegeta-
ble diet, and a stimulating animal diet, without reference to other
points of treatment, made a difference in the general duration of
those cases, of twenty-two days; those on animal diet occupied,
on an average, fifty-five days, and those on vegetable diet only
thirty-three days.

I proceed to state to you my observations on the primary sy-
philitic sores, or chancre, as they are called. Now the word
chancre denotes the acrid, or eating, or ulcerative quality of
those sores. It is rather an equivocal term, and it is therefore
best, perhaps, to employ it as little as we can help. The expres-
sion—primary sore, would answer the purpose for the word chancre, because chancre is supposed to be a syphilitic sore, one possessing venereal properties; and as among the ulcerations incidental to the whole frame, there are several that do not possess these properties, it is supposed, when we speak of chancre, that there is a peculiar poison in the case. Now, as we cannot, in a great variety of cases, know whether any such poison has been communicated or not, it is better to employ that term as little as we can help. Primary sores then appear, chiefly, on the external organs of generation of the two sexes; most commonly on those parts covered by a thin and delicate membrane, such as the glans penis, or lining of the prepuce, in the male; on the various parts included between the labia pudendi, covered by a thin skin, in the female. These are the most frequent seats of primary syphilitic ulceration. Such sores may come, and they are not uncommon, on the external parts of the organs of generation which are covered by common cuticle, as on the external skin of the prepuce, of the penis, or on the labia pudendi. Now, they may also come on the smooth surface of mucous membrane, but they are much less common in those parts than in other places. Syphilitic sores, it is true, do show themselves within the urethra of the male, and within the orifice of the vagina of the female; but they are uncommon in both of these situations. They are generally produced by the application of the poisonous, or infectious, secretion to the external and unbroken surface of the part; they may be produced, too, by the application of such secretion to the surface of a recent wound, or of an open ulcer. In the latter way they are occasionally produced on the fingers and on the nipples. With respect to the latter, I am not exactly certain whether it is necessary there should be any actual excoriation, or breach of surface, in order to produce that consequence of the affection which takes place when a healthy woman suckles a diseased child; but in the case of the reception of venereal poison through the fingers, we only see it take place where there has been some external wound, or breach of surface, from a previous cause; at
ON THE VENEREAL DISEASE.

least I know of no instance within my own experience where a primary venereal sore has taken place on any part of the fingers or hand, when the cuticle has remained unbroken. But within no very long time I have seen four cases, in which the venereal poison has been absorbed through the medium of wounds on the finger or thumb.

A gentleman called on me one day, saying he had got a painful affection of the thumb, and that it had arisen from a gnat-bite. He opened his arm, and I found a very serious inflammation going on of the subcutaneous textures of the forearm and arm. He then uncovered the thumb, where I saw a nasty, foul sore, about the size of a shilling, in the situation of the first joint of the thumb, with considerable swelling and redness of the part. I asked him how this had happened. He said he had received a gnat-bite on the thumb, which had festered, and then, getting worse, the arm had inflamed to the extent to which I saw it. I looked at it attentively, and it appeared to me to be much more serious than any thing I had ever seen to arise from a gnat-bite. I told him I never saw such an effect produced by a gnat-bite, and that I thought something else must have taken place. I must observe, that he was a very free liver, and indulged much in the pleasures of the table, consequently he was an individual who might have suffered as much from the bite of a gnat as any person could have done; but this was certainly past any thing I had ever seen produced by such a cause; there was a very foul, nasty sore, with high inflammation of the limb, assuming very much the character of phlegmonous erysipelas both of the forearm and arm. He then said that something else had occurred to him, which, however, he considered could have had nothing to do with the present state of his hand; in truth, that he had been dining with some friends in the city, and that on his return along the Strand, he had got into conversation with a damsels, and had been silly enough to put his hand under her petticoats, but that he had really done nothing else to her. When he got home, he said, he found that his hand smelled very badly, and he therefore immediately took
means for cleansing it; he resorted to abundant ablution to get rid of the smell; that, in fact, from that time, the thumb had had something the matter with it, and that either from the gnat-bite, or something else, it had got worse and worse; in fact, it was very clear that a syphilitic poison had been absorbed by the wound, and that this was the result. The first thing, therefore, to be done in this case, was to reduce the inflammation. I accordingly ordered the application of a large number of leeches, and directed other suitable means to be employed, and that he should keep quiet. I did not see him again for three or four days, because he was not regularly under my care. However, he had got rid of much of the inflammation of the arm and forearm although not all of it, but the state of the thumb was not at all amended. I directed the black wash to be applied, and that he should take blue pill, five grains three times a day. He went on with this for a few days, but it had no effect on the system, and the sore became rather worse. I then deemed it necessary to employ the medicine in very large doses; I gave him calomel and opium largely, and he was violently salivated; the sore then put on a healthy appearance and proceeded rapidly to heal. As I have said, he was not regularly under my care, and he discontinued the use of the mercury before he had been completely cured; the consequence was, that the sore went into an unhealthy state again, and he was under the necessity of going through a salivation a second time; by this, however, he was cured.

Not long ago, a surgeon, of whom I previously knew nothing, wrote to me from the country, stating a similar case; he had got a sore on his thumb, or on one of his fingers, I do not recollect which. He had delivered a poor woman of a child in the town where he lived, having had a good deal to do among the poorer classes of society from a connexion with the parish workhouse. Finding a sore had been produced on the finger or thumb, by inoculation, as he thought, and that it was becoming very bad, he was induced to examine the woman, when he found that she had got venereal ulcers. The sore increased rapidly, and it spread into a...
very nasty, foul ulcer. He wrote to consult me on it, stating these circumstances, and begging to know what I thought of it. I wrote to him, saying, that I had no doubt he had imbibed the venereal poison, and I recommended him to use mercury very freely. He came to town soon afterwards, and I saw him; he looked very sallow, pale, and ill. He showed me the thumb or finger, which was much swelled, of a bright red colour, with a large foul sore upon it. He said he had suffered much on his journey to London. He began to take mercury as soon as I wrote to him, but it had not acted on the system; he thought, however, that the progress of the sore had been checked by it, but he had suffered in coming to town by another cause—he had had an attack of the piles, which came on just before he left the country, and had been very painful in the coach during his journey. I asked him if he had ever had piles before; he said no. I thought it was very strange that he should have experienced a severe attack of piles just at that moment, as he had never suffered from them before; but he said he was sure such was the fact, because he had shown them to a surgeon in the town where he lived, who had said they were piles, and applied caustic to them. I requested him to let me look at them, and I found that he had got a set of venereal ulcers about the fissure of the anus; in fact, that the whole external integuments around the anus were a set of chapped and ulcerated sores, extremely inflamed and painful; in short, a set of secondary venereal ulcerations proceeding from this primary sore on the hand. As soon as he arrived in town, I made him confine himself to the house, put him on a very active mercurial course, got his mouth affected very rapidly, and, as soon as that was the case, the ulcers both of the thumb and the anus healed; he got well, and went back into the country in about three weeks. I have heard nothing of him since, and I suppose he has continued well. I saw another medical gentleman, who had been in the habit of attending a great many low women in the country, and he had a sore on the hand, which no doubt was syphilitic; he had both a swelling and sore—swelling of the axillary glands, and a scaly eruption spread over
the whole body; these suddenly disappeared when mercury was employed. I say, therefore, that these diseases may be acquired by other means than sexual intercourse; and it is a matter of great consequence to a surgeon who has to examine patients labouring under syphilitic diseases, or who has to handle the genital organs of females who may be so affected, to take great care that he does not allow any of the discharge to come upon a recent wound. I may mention, that Delpech, in his Observations on the Treatment of Venereal Diseases, mentions the case of a surgeon who contracted a sore on his fore-finger in this way, from handling the ulcerated fissures of the anus of a patient. Some of the moisture produced from those ulcerated fissures came in contact with his finger, which had been previously hurt; itching and pain immediately ensued; ulceration of the wound and swelling of its circumference took place on the next day; swelling of the glands, eruptions over the whole body, disease of the bones of the nose, and other parts, were the consequence; and Delpech says, that the patient did not recover until after six years of suffering and treatment. The application of the venereal poison does not produce its effect immediately; some interval of time takes place, as in small-pox, cow-pox, and hydrophobia. Syphilitic sores seldom appear in less than five or six days, or a week after coition. I have known the interval between coition and the appearance of the symptoms to be as much as four or even five weeks. Mr. Hunter states that he has known a syphilitic sore to commence in twenty-four hours after coition, and that he has known it to be delayed as long as seven weeks; he mentions one instance in which the interval was two months. Where the poison is applied to broken surfaces, as in the cases I have mentioned, the symptoms come on very much more rapidly. In those cases a very painful state of the wound was experienced in a few hours after the poison had been applied; and certainly within twenty-four hours, decided appearance of syphilitic sores was manifest. The syphilitic sore shows itself at first in the form of a pimple, or minute vesicle or pustule, that ulcerates and spreads by the ulcerative process. Generally
speaking, the process of ulceration in a syphilitic sore is not very rapid; it is rather a chronic kind of ulceration, though there is considerable difference in the various kinds of sores which belong to this disease.

Usually speaking, the syphilitic sore is of a circular figure, but not necessarily so. The sores which are produced by the application of venereal poison to the external organs of generation are various in their appearance. We cannot describe one particular character of sore as the result of venereal poison. We find that there are several, all of them seeming to be equally produced by that cause, and yet differing materially from each other in their characters. In the first place, the simple venereal sore, which has been called by Mr. Evans, in his work to which I have before referred, *venerea vulgaris*—common venereal ulcerative sore, is a superficial ulceration, taking place, very commonly, on the internal surface of the prepuce. Usually there is more than one; you have generally a sore upon the corona glandis; frequently, two, three, or four of them in that situation, under the prepuce; or such a number may form around the orifice of the prepuce itself. In the first place there is a degree of excoriation from ulcerative absorption; after a certain time, the excoriation thus produced is filled up, so that the sore becomes again level with the rest of the surface. The continuation of the reproductive process goes on and produces an excess of substance in that particular part, so that it projects above the surrounding surface, and then the part cicatrizès. These are the stages this sore goes through, and it will often occupy four, five, or six weeks in proceeding through the different stages. It is also very painful, and, commonly, the surface bleeds when the dressings are changed and the part is exposed.

Venereal sores frequently occur on the frænum of the prepuce; indeed there is a kind of fold of the prepuce upon the glans, in which matter may easily lodge, so that we are not surprised that this should often be the seat of venereal ulceration. When it takes place there, it very commonly penetrates
through the fraenum, and tends to destroy it. The ulcerative process, at times, extends quite through it, forming ulcerative fissures. These altogether may be considered as ordinary common syphilitic ulcerations; they are, perhaps, the most frequent form of the affection.

There is a venereal sore in which the margin of the ulceration is elevated, and a little indurated; it is a syphilitic sore within the edge, forming just at the reflection of the prepuce, over the corona glandis. Frequently this kind of sore is seen on the external surface of the prepuce, or penis; there is a roundish kind of margin; the surface of the sore itself has something in it of a peculiar character, and the discharge from it is scanty in quantity; it bursts, and forms a thin scab.

Thirdly, there is the indurated chancre, that is, a venereal ulceration taking place on an indurated basis, so that the margins of the sore, and the basis on which it is formed, present an unnatural hardness. Mr. Hunter, in his account of chancre, or primary venereal sores, says the basis is generally hardened; and hence, in consequence of the description he has given, many surgeons have entertained the opinion, that a hardened basis and edges are essential to the character of a true syphilitic sore. Now, if we take all the primary syphilitic sores that we meet with into view, we find that the greater portion of them do not possess this character of hardened basis or edge; they are not indurated sores; that character is only exhibited in a certain proportion of the primary sores. Yet, in consequence of Mr. Hunter's having given this description, some have considered that a true syphilitic sore must have this hardened basis and edge, and that those which do not possess that character are not true venereal ulcers. They have even gone further than this, for seeing not only that a great variety of primary sores do not possess this character of induration, and seeing the progress of syphilitic disease in other points deviate considerably from what Mr. Hunter has laid down, they have drawn the inference that the character of the disease itself has changed since Mr. Hunter's time; that syphilis,
in fact, is now a different kind of disease, in many essential points, to what it was when Mr. Hunter wrote. Now, I cannot say that, for my own part, I can adopt this conclusion. I think it much more probable that Mr. Hunter should have been mistaken, or inaccurate, than that the nature of the disease should have changed. If we look back to the description of disease, of whatever character, as given in the most ancient times, we find all the descriptions agree very much with what we observe now. We have no reason to say that nature has changed in any essential point in this disease any more than it has changed in any other. I cannot help calling to mind the short but pithy remark of a great critic of antiquity—

"Opinionum commenta delet dies,
Naturæ judicia confirmat."

That is—

"Time destroys the fictions of opinion,
But confirms the decisions of nature."

Now, when I see the fanciful speculations, and the contradictory statements and views which make up so large a part of Mr. Hunter's treatise on this disease, I cannot help classing it among the "opinionum commenta." I am sure it does not belong to the "naturæ judicia."

The induration which accompanies venereal sores is of different kinds. In the first place, there may be a small and moderate induration; there may be a considerable mass of hardness, presenting a cartilaginous character, so that when you feel the part under your finger, it seems as if you were feeling a bit of cartilage, and the ulceration is seated upon that indurated part; sometimes it happens that this cartilaginous induration remains after the healing of the ulceration; and, sometimes, such an induration will take place at a remote period, after the cessation of the symptoms, without ulceration; it will come on as a kind of secondary appearance. I saw a gentleman who had previously had two or three small sores which healed, under the moderate use of mercury, in three weeks. In three weeks more, without any fresh in-
fection, an ulceration, with induration, formed at the basis of the prepuce; the induration was equal in size to a horsebean; the ulceration was about equal to the size of a split pea. He took blue pill, and applied mercurial ointment; the sore was healed in a fortnight; the induration was reduced to a third in a month, and had disappeared entirely in another month. This happened about two years ago, and the gentleman has continued well since.

I remember the case of a medical gentleman who consulted me for obstinate venereal sores which healed, and after they healed he married. In a year afterwards, a large hard lump, (equal to the size of the last joint of the little finger,) of a bright-red colour, came on the prepuce, with a few scaly eruptions on the head; they were secondary symptoms, and were permanently cured by mercury. It is not uncommon to see indurations of that kind come on at rather a remote period after the occurrence of the primary syphilitic symptoms.

The fourth kind of ulceration I have to mention to you is the phagedænic primary sore, a primary sore presenting those characters which I have already had occasion to mention to you in speaking of phagedænic ulcerations; that is, the removal of a part by ulcerative absorption. The part has a sharp edge, is sometimes undermined, and the surface is irregular and ragged; there is an eating away, as the term implies, of the textures of the part; there is no formation of granulations; there is nothing like an attempt at the reproductive process, and there is a thin, ichorous, and very offensive discharge from the sore. Sometimes you see this phagedænic process of ulceration extending slowly upon the prepuce or glans, and gradually destroying those parts. At other times it goes on with much more rapidity; the surface of the sore assumes a livid appearance; there is an ichorous discharge; and, without the occurrence of sloughing, but simply by ulcerative absorption, it rapidly destroys the part in which it is situated. There is thus a kind of acute rapid phagedæna, and a more chronic or slow kind of phagedænic ulceration.

The fifth kind is that of sloughing; or gangrenous chancre, where there is a loss of vitality, and the surface of the sore as-
sumes a dark, black, and manifestly a sloughing appearance. The surrounding parts are highly inflamed in this case; there is considerable redness, swelling, and acute pain; there is also loss of vitality, the ulcerative surface of the part that has sloughed is separated, and a fresh slough forms over the part; thus the sore becomes rapidly larger, and it spreads in every direction, until the part is destroyed by that kind of process which I have described as constituting sloughing phagedæna. Then when a part assumes, in this way, a gangrenous form, and when the ulcerative process extends under it, certain destruction of the part ensues, unless the process can be stopped. Considerable inflammation attends the progress of this process, affecting all the surrounding parts; thus, when it is seated on the glans, or in the prepuce, phimosis takes place; the prepuce becomes inflamed and swelled, and cannot be retracted; then the progress of the sore is hidden from your view. The external surface has a bright-red and smooth appearance, and there is a copious discharge from the contracted orifice; there is a sanious, ichorous, extremely offensive discharge going on. This sloughing chancre is found to take place under two different circumstances. We very commonly see it as the result of neglect and intemperance; in the case of sores that may not have been sloughy originally, and where persons, having primary syphilitic sores, take none of the precautions to get rid of them, but continue their occupations, and go on with their intemperate habits, causing a high degree of inflammation to be superinduced upon a complaint which is, of itself, originally of an inflammatory nature; but, in other cases, the sloughy state is observed from the very commencement. There is a high degree of constitutional disturbance under this form of change; there is a full and hard pulse, more particularly when it occurs in young, robust persons; a white tongue, and, in fact, the general symptoms that characterize high inflammatory fever.

These are the principal varieties which we observe in the appearance and characters of primary venereal sores. I do not know that this enumeration includes all the forms of ulceration that may be observed; in fact, there are intermediate degrees, be-
between them; but all we have to do with respect to description, is to present you with an outline of the circumstances. We cannot, perhaps, embrace, in our account, the minute features of each particular gradation.

It is important to observe the distinction between syphilitic sores and other ulcerations or affections which are incidental to the same parts. If an ulceration take place on the external organs of generation of a healthy person, a few days after having had connexion with a suspicious character, we can have very little hesitation in ascribing the disease which is then produced to the application of venereal poison, because, in ninety-nine cases out of a hundred, the disease unquestionably will be venereal.

Persons are continually pester ing us by asking, whether this sore or that sore is venereal or not. I am very much in the habit of telling them, I consider it comes from whoring, and if they had not been employed in that which they ought not to have been doing, they would have had nothing the matter with them.

As to the expressions true syphilitic, and non-syphilitic—true and bastard syphilis—these terms I have already told you I entirely discard. All sores that arise from sexual intercourse are, with me, venereal sores; and I have mentioned to you the various characters these assume under various circumstances. I regard any of these characters to be as much venereal as any other of them. I do not know that the character of syphilis belongs to one of them more than to another.

Now the prepuce, both on its external and internal surface, is liable to an attack of inflammation, and the formation of minute lymphatic vesicles, which we call herpes praeputialis. A little portion of it inflames, a few vesicles form on it, the fluid contained in them becomes purulent, it is discharged, and dries up on the surface. It is, I think, so decided in its character, that it can hardly be confounded with any venereal disease; then the surface of any part of the external organs of generation concerned in copulation, may be seriously abraded, or broken by exertion at the time. This is a circumstance that takes place at the very time of coition, and it is an immediate effect; therefore you distinguish that, or
any thing that occurs immediately afterwards, from that which does not take place until some days subsequently. There is a secretion natural to these parts, which occasionally accumulates with persons who neglect cleanliness, and which may be the source of irritation and ulceration. The prepuce, and, indeed, the whole penis, is sometimes liable to a kind of inflammation producing a scaly surface, like what is called psoriasis in other parts. There may be a redness, with a scaly state, which cracks and comes off, but that can hardly be mistaken for venereal disease.

In the treatment of venereal sores the first question that occurs is, whether we should attempt to remove or get rid of the venereal poison in the very commencement of the disease by any process at all similar to that which is employed in the case of the other animal poisons, such as hydrophobia. Now, excision, or destruction of the parts by caustic has been recommended with this view. I believe excision is very little practised in venereal diseases; but, sometimes, on the very first appearance of the pustule or venereal sore, we apply lunar caustic, and this prevents it from making any progress. With respect to the treatment of the sloughing venereal sores, when you come to consider the high state of inflammation of the parts, that they lose their vitality in consequence of it, when you consider the general circumstances attending the case, you can have no hesitation in saying that antiphlogistic treatment of the most active kind is necessary. This is no case at all for mercury. The employment of it would not only do no good, but would aggravate the mischief. It accelerates the gangrenous process; it increases the destruction of the part; it adds to all the symptoms. You should, therefore, take blood from the arm: perhaps take blood locally also; purge the patient, put him on low diet, and then administer sulphate of magnesia and the tartrate of antimony. In fact, employ the means that are calculated to reduce excessive action. Locally, apply soothing remedies, tepid fomentations, and warm poultices to the part. That is, employ all means, locally and generally, that are calculated to reduce excessive action; and in that way you will treat cases of sloughing chancres with the greatest efficacy.
Now I have mentioned to you that in these cases you will often find inflammation of the prepuce with phymosis; and that state of the parts aggravates all the mischief that would arise from the affection considered in other respects. The glans penis, if it be the seat of the chancre, is highly inflamed, and consequently considerably swelled. This inflamed and swelled state of the glans pain-

fully distends the prepuce. The prepuce is also highly inflamed, and acts as a kind of ligature and a source of local pressure upon the inflamed and sloughing glans penis. Thus the glans and the prepuce mutually injure each other. The swelled glans produces a stretched and inflamed condition of the prepuce, and, in fact, carries that inflammation to such a degree as often to produce mortification; and the pressure of the inflamed prepuce acts with equally injurious effect on the glans itself. You find every indication of high inflammation of the penis generally, and of the glans particularly. You have a copious flow of reddish, sanious, and very offensive matter, from the contracted orifice of the prepuce; under such circumstances, no doubt, the means I have just mentioned to you will relieve the symptoms of the affection; the free employment of the antiphlogistic means will lessen them. But these alone will not do. You will not succeed in relieving the patient unless you combine with them the operation of dividing the prepuce. Carry a director into the orifice of the prepuce, and conduct it along the superior and middle surface of the glans until it has reached the part of reflection over the glans; you then divide the prepuce by a sharp-pointed bistoury; and as in this way you cut through the whole of the prepuce, you generally produce a very large bleeding, which affords great benefit; and still further relief is afforded by thus relieving the glans and the prepuce both, from the pressure which they mutually produced on each other. This is a very important auxiliary measure in addition to the antiphlogistic means I have already described. Now, some apprehension has been entertained respecting the effect of this process, from the probability of the divided edges of the prepuce taking on the same gangrenous or phagedenic process which is going on in
the original ulceration. The risks of this operation have been very strongly represented by some persons as a sufficient reason against resorting to the practice. I have divided the prepuce in a great number of instances in cases where the worst kinds of ulcerations have existed either upon the glans, or upon the internal surface of the prepuce itself; and I have never, in any one single instance, seen any ill consequences result. I have never seen an unfavourable ulceration take place on the margins of those wounds; on the contrary, in instances where a sloughing or phagedenic state of ulceration has existed, and the sores have been exposed by such a division of the prepuce, I have very frequently seen that the margins of the divided prepuce, that is, the edges of the wound, have maintained a perfectly healthy character, and have actually healed, while the other destructive process has continued to present irregular sores; but the general course of experience is, that the sloughing chancre or phagedenic ulceration gets into a perfectly healthy state, and that it, as well as the margins of the wound which has been newly made, proceed most favourably after the parts have been so liberated. When the sloughing symptoms have been reduced by the antiphlogistic plan, we frequently find that though the sloughing character is removed, the sore remains in the state of phagedenæc ulceration; that is, there is great pain, and the patient is restless, and suffers very considerably. In that state you employ opium both locally and generally. You give opium internally, freely, a grain of opium once in eight, six, or four hours; and you apply opium to the sore in the form of lotion, and perhaps the best form of that is what I have already mentioned to you—the liquor opii sedativus of Battley, diluting an equal part of it with an equal quantity of distilled water; dipping a piece of lint in it, laying it over the sore, and then covering the whole with a bread and water poultice. In this way the irritable state that may remain after the adoption of the antiphlogistic means is most effectually put a stop to.

In the progress towards recovery, you may perhaps find a state in which the local application of mercury might be advantageous,
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the black-wash or fumigation. You may also find that sarsaparilla would be useful. But it is only in some rare instances that you can use mercury, even locally, in cases which have had the sloughing character.

There are some instances in which the local excitement, and the general excitement connected with sloughing chancre, have subsided before we see the case. We may find that the prepuce, or the glans, or both, and perhaps one-half of the penis, has sloughed before we have had an opportunity of interfering. Perhaps we may see the entire half of the penis as black as one's coat. Here we shall find the general febrile disturbance has subsided; that the patient has a reduced, feeble, and languid pulse, with a cold state of the surface and extremities, and with all those general symptoms of depression which accompany the supervention of mortification, when it occupies a very considerable part of the body. In such a case, of course, any antiphlogistic treatment is out of the question: stimuli, tonics, cordials, may be advantageous; perhaps opium, bark, wine, or even brandy. The local applications and means must be of the same character, such as the balsam of copaiba, and the various other remedies of which I had occasion to speak to you in describing generally phagedænic and sloughing ulceration.

I have only a few words to say to you respecting the treatment of phagedænic ulceration. This, like sloughing chancre, does not bear the general administration of mercury. You may employ mercury locally,—you may apply the black-wash to the parts. You will resort to narcotics to relieve the pain which accompanies the phagedænic character. You may employ sarsaparilla internally, and such other means as particular symptoms may require; these constitute the treatment of phagedænic chancre. You will very often find that the ulcerative process will take its course, so as to destroy the glans, or the prepuce, or both, without your being able to counteract it; and you would not do any good by administering mercury; but, under such circumstances, you might aggravate the mischief. Now it does sometimes happen, however, that when a state of active phagedænic ulceration is going on
rapidly, and parts are being destroyed by it, you can arrest the
progress of the disease by the exhibition of mercury. When
there is a simple phagedænic state of the chancre, when there is
nothing like sloughing to be observed, when there is nothing but
ulcerative absorption, and the consequent destruction of parts by
it, without any considerable redness or swelling in the surrounding
parts,—without any considerable constitutional disturbance, but
the destructive process going on rapidly, you may find it expedient
to exhibit, and sometimes you may succeed in stopping the pro-
gress of the affection by the active exhibition of mercury. I ac-
knowledge it would be difficult to point out the distinction between
these,—to say precisely what is the kind of phagedænic ulceration
in which you ought to use mercury, and what is the kind in which
you ought not. It is a difficulty that can only be overcome by ex-
perience; but I think it right to say, that there are such cases. I
would say, that you should, in the first place, endeavour to relieve
and stop the progress of the disease by antiphlogistic treatment;
that you should take blood from the arm, and endeavour to arrest
the progress of the affection by such means. Supposing you do
not succeed, then I think you may properly try the mercury in a
decisive form; and here you would give the remedy in pretty con-
siderable doses, and frequently repeat them,—two, three, or four
grains of calomel every eight, six, or four hours; and if you found
you did not do any good by that, then you must have recourse to
the soothing plan of treatment I have already described.

Having pointed out the treatment of sloughing and phagedænic
primary syphilitic sores, I have now to address you on the treat-
ment which should be adopted in primary syphilitic sores of other
descriptions: that is, in the simple venereal sore in which there is
no induration, nor elevation of the edge; and the primary sore
which has an elevated margin, and the indurated character, and in
the various other modifications, which may approach more or less
to the character of either of these; and these will include the
greater part of primary syphilitic sores, for the sloughing sores and
the phagedenic sores are few in comparison with the others.
It is in reference, then, to the sores of which I am now about to speak, that the question occurs as to the use of mercury; for in sloughing sores, and also in phagedænic sores, generally, the use of mercury is out of the question. Now, with respect to the other descriptions of primary venereal sores, I think the points we have to consider, regarding the employment of mercury, may be comprehended under three questions; first, whether the use of mercury is essential in the treatment or to the cure of such sores; secondly, whether the employment of mercury will abridge the duration of the complaint; or, in other terms, whether it will expedite the cure; and thirdly, whether it will prevent the occurrence of secondary symptoms; whether it will have any effect in protecting the constitution from those subsequent occurrences which we call constitutional syphilis.

Now, that the employment of mercury is not essential to the cure of these sores, I have had occasion to explain to you, and I have shown to you that it has been proved by abundant evidence, that all forms of venereal disease may get well without the use of mercury. The next question, then, is, whether it abridges the duration of the complaint; and on this, the evidence is in some respects contradictory. I know it was the opinion of Mr. Rose, whose name I have mentioned, as having commenced in this country those important investigations which throw so much light on the natural history of the venereal disease, and who first shewed that primary syphilitic sores might get well without the use of mercury—I know it was his opinion, that although the cure of primary syphilitic sores could be accomplished without the aid of mercury, yet, that the disease lasted longer—was more tedious than when mercury was employed; and that also has been the opinion of others who have tried the non-mercurial treatment extensively. Yet, from the experiments that have been made in other instances, it appears that the sores treated without mercury got well, on an average, in a shorter period than those that were treated with it. I allude now to some comparisons that have been made in the English army, and also to some that have been made abroad.
A report was made by Sir James M'Gregor, the Director General of the Army Medical Board, and Sir William Franklin, another member of that Board, of 1940 cases of primary venereal sores that were treated without the use of mercury in the course of two years, and the average period of cure in those cases was twenty-one days where there were sores without bubo; forty-five days, in those cases in which bubo existed with sores. During the same period 2827 cases of primary sores were treated with mercury, and they occupied in the cure, on an average, thirty-three days where there were sores without bubo, and fifty days where there was bubo with sores. So that here you observe, in point of duration, there is considerable advantage derived in the treatment of such cases without mercury.

In a certain number of cases treated at the hospital called Val de Grace, in Paris, a similar kind of result was obtained; that is, out of 1084 cases of primary venereal sores, 386 were treated with mercury, and the average duration of those cases was forty-seven days, without distinguishing whether they had buboes or not; 698 were treated without mercury, and the average duration of those cases was twenty-eight days; according to these statements, then, the result, as far as relates to the period occupied in the cure, seems to be much in favour of the treatment without mercury. The cure was more expeditiously effected when the patients were treated without mercury, than when that remedy was adopted. We do not know exactly the grounds on which the choice was made, in those cases that were treated without mercury, and those that were treated with it. Perhaps the two modes of treatment were applied to a different class of cases, so that we do not know whether this gives us a clear view of the average result of the treatment of cases of the like kind; but looking at it in either way, as I said before, the non-mercurial treatment certainly appears in the most favourable light.

The third question, then, which is a very important one, is, whether the employment of mercury in the treatment of the pri-
mary affections, can be considered as at all tending to prevent the occurrence of secondary disease. Now on this point the opinion of Mr. Hunter seems to have been, that the employment of mercury could have no effect as to the subsequent occurrence of secondary symptoms. He says, generally throughout his work, that mercury will cure the condition of the venereal disease, but that it will not cure the disposition to it; that is, that it will cure the disease which exists at the time you employ it, but that it will not prevent the occurrence of subsequent symptoms. His opinions on this point, in various parts of his works, are contradictory; and, I suppose, in point of fact, that he really never instituted any comparative trial himself, but that the opinions he has given on this subject are rather theoretical than practical. However, the returns of a great number of cases treated in the army in the one way and in the other—the returns of cases where patients continued under the constant observation of practitioners for a considerable length of time, where there was an opportunity of accurately ascertaining the result—the returns of such cases lead us to an opinion quite contrary to the statements of Mr. Hunter. They certainly induce us to think that the employment of mercury in the treatment of the primary symptoms, has a marked effect in preventing the occurrence of constitutional or secondary symptoms. This, of course, is entirely a question of experience; it can only be solved by observing the effect of the one and of the other treatment, in a great number of cases. Mr. Rose states, that of the cases he treated without mercury, about one in three had secondary symptoms; that is, a third of all the cases had constitutional symptoms. There were some experiments made, about the same time, at the York hospital—a military hospital at Chelsea, which has been discontinued, and in those experiments it was stated, that the proportion was one in ten; but in larger experience in the army, it is found that the proportion of secondary symptoms is not more than one in twenty. In the 1940 cases that were treated in the army without mercury, ninety-six instances of secondary symptoms occurred; and that is about one in twenty of all descriptions. In the 2827 cases which were treated with mercury, there were
only fifty-one cases of secondary symptoms, and that is one in fifty-five. So that, in the whole number of primary cases which were treated without mercury, there was a proportion of secondary symptoms amounting to one-twentieth; in the whole, treated with mercury, the proportion of secondary symptoms only amounted to one fifty-fifth. The inference, therefore, from this view is, that the employment of mercury in the treatment of primary syphilitic sores, has a marked influence in protecting the patient against secondary symptoms.

Now I cannot adduce any experience of my own that at all equals in extent that which I have now detailed to you of those cases treated in the army; but I should state to you, decidedly, as the result of my own experience, that there are very few instances of secondary symptoms occurring, where the primary sores, of the descriptions I have already mentioned to you, were treated without mercury. It is my plan, in private practice, to employ mercury moderately—not extensively, but moderately, in the treatment of primary syphilitic sores, (excepting in the cases of sloughing and phagedænic sores,) and certainly I have been in the habit of seeing secondary symptoms very seldom occurring in such cases; I may, therefore, state to you, that my experience in private practice, quite accords with the inference to be drawn from the large experience exhibited by the Army Medical Board.

I would state to you, then, that in the description of sores I have mentioned, I should generally administer mercury in a moderate way. In the first instance, one would clear out the alimentary canal of such patients; one would keep them as quiet as possible, put them on a moderate diet, and administer mercury moderately; three, four, or five grains of the blue pill two or three times a-day, and apply the black-wash, that is, calomel and lime-water, to the sores; and this kind of treatment is certainly, on the average, very successful in the cases of which I am now speaking.

The employment of mercury is more particularly necessary in the cases of indurated chancre; and whether the chancre possesses that character originally, or whether the induration comes on subsequently, or whether the induration occurs in a secondary way,
after the primary sore is healed, and shows itself simply as induration without sore, I think the employment of mercury is equally required. We cannot consider our patients to be safe, so long as such induration remains, and I think it is desirable to use mercury in those cases, and to continue the employment of it until the induration has completely disappeared.

There are some instances in which sores form upon the glans, or the internal surface of the prepuce, and where the prepuce goes into a state of phymosis*; so that we ascertain the existence of the sore rather by the discharge that takes place from under the prepuce, than by any direct evidence of its existence. After the inflammation of the prepuce is reduced by soothing means, if the discharge continues, and if we feel an induration on examining the prepuce externally, or if, upon handling the glans, pain is felt, we naturally conclude that a syphilitic sore is on the glans, though we cannot see it; and in such instances I think the moderate employment of mercury is proper; and we may inject (after syringing the part well with warm water) the black wash, or a solution of the sulphate of zinc, or of the nitrate of silver.

In some instances, primary syphilitic ulceration makes its way through the internal membrane of the prepuce, through the reflection of the prepuce over the glans, and then the ulceration creeps on under the sheath of the integuments which surround the glans; and when this part of the prepuce is thus perforated by ulceration, diseased action very frequently extends under the integuments, and almost entirely isolates the body of the penis, passing sometimes as high up as the pubes. Under such circumstances, it seems to me always to be the best plan to slit up the part that is thus undermined by ulceration. We find that healthy action does not take place if we leave it in its original state; it is necessary to slit up the undermined portion of skin, and then you will find it will heal very readily.

When the absorbent glands of the groin are affected, in conse-

* Compressing the prepuce, enveloped in a piece of lint dipped in cold water, will very frequently enable the surgeon to examine the glans.—Ed.

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quence of primary syphilitic ulceration, they sometimes swell rapidly, become red, hot, and painful—suppuration quickly takes place in them *. In other instances they swell slowly, the pain is not considerable, the swelling does not become red; the parts are indurated—simply swollen and indurated. There is a kind of acute inflammation of these glands, leading to suppuration; and there is a more chronic swelling leading to induration and tumour. The treatment of these swellings, or, as they are technically called, buboes, a term derived from the Greek, signifying groin—the treatment of bubo, I say, of course is the same, so far as the general means go, as that of the primary symptoms with which it is connected; they both participate in those general means which are adopted for the primary symptoms. The state, however, of the swelling of the glands may of itself require particular measures. If there be active inflammation of the glands, you treat it as you would active inflammation occurring elsewhere; you apply leeches; you may apply cold lotions, you may apply poultices, and whatever a simple kind of inflammation elsewhere would require. If formation of matter takes place, it is as well, perhaps, not to be too hasty in opening the bubo, for we sometimes find that it is absorbed, and it may not be necessary to remove it by an opening. When, however, the integument has become thin, and there is a sensible fluctuation, it is generally expedient to make an opening in the collection, for you find it will otherwise open itself. You may either slit up the thin skin by a longitudinal incision, or you may apply caustic, if the detachment of the skin has been very considerable, in order to destroy a portion of the detached integument. We generally find the suppuration is not in the glands themselves, but in the cellular substance surrounding them, so that, when we open the bubo, if the opening be considerable, we see the glands exposed, nearly as much as if they had been dissected. If the sore, which is connected with bubo, requires the employment of mercury,

* The Tinct. of Iod. or the Nit. Arg. applied once in twenty-four hours for about a week, will effectually prevent the suppuration of the unguinal glands. —Ed.
and if the bubo itself be of the indolent and indurated kind, rather than of the active inflammatory description, it will generally be advisable to employ mercury in the form of friction; and this form of using it has generally been considered to have been particularly advantageous; it has been supposed, that the passage of the mercury through the diseased glands, has an advantageous effect in dispersing the bubo; whether this be the case, perhaps, is rather doubtful. Such, however, is the opinion of Mr. Hunter, and he speaks very strongly of the advantages that are derived in the dispersion of buboes from the employment of mercury in this way. Indeed, he says that, for a considerable portion of his life, having been in the habit of using mercury very extensively in this manner, he has never seen any bubo proceed to any extent under that treatment; that he has checked the progress of it, so as to prevent suppuration occurring. If the bubo has either been opened or has ulcerated, and if the sore that has been produced is going on favourably, has a healthy aspect, and if the primary syphilitic ulcer should have healed, it is not necessary to persist in the employment of mercury on account of the bubo; we may then leave the mercury off, and use simple common measures of treatment.

It frequently happens, in persons of scrofulous constitutions, or of those who are otherwise of a weak habit of body, that the ulceration of bubo extends—becomes very considerable; that sinuses formed by suppuration, occur in the loose cellular membrane about the bend of the thigh, and sometimes very formidable local affections are the result. Under such circumstances, I need not observe to you, that perseverance in the use of mercury would be most prejudicial—that it would aggravate all the symptoms. In such cases, we should give the patient the advantage of country air, change of air, the sea air, good diet, tonic medicines, and not think of persevering in the use of mercury. When the integument covering a bubo has been thinned considerably before it has been opened, it often happens that the edges of the bubo are undermined in the ulcerative stage, that the margin is left in an unhealthy state, and that cicatrization does not take place in consequence. Here the
progress of the cure has been much accelerated, by paring off with a strong sharp pair of scissors the undermined edge or skin of the bubo; after doing this, you will find the cicatrizition will take place very rapidly. In such instances, if cicatrizition does not advance as fast as you would expect, it will be well to employ mild stimulants; the red precipitate, for example, or the solution of the nitrate of silver. In addition to that, you should use pressure, by placing compresses on the ulcerated part, and firmly binding them on. We sometimes meet with swellings of the glands of the groin of an indolent kind, which do not proceed to suppuration, and do not disperse. The glands remain swelled and painful, the patient is prevented from taking his ordinary exertions, and continues much in the same state for a considerable time. Under such circumstances, the application of blisters to the surface of the skin is very often advantageous. Sometimes such an application will decrease the inflammation in the glands, and bring it on to suppuration; sometimes it produces dispersion of the glandular swelling.

I have in the next place to speak to you, gentlemen, of the secondary symptoms of syphilis. In general, an interval elapses between the appearance of the primary and secondary symptoms; and usually this interval is from six to twelve weeks. Occasionally, however, the secondary symptoms come on at an earlier period; even show themselves before the primary symptoms have disappeared. It is not very uncommon to see a person having, at one and the same time, primary syphilitic sores, buboes, eruptions of the skin, sore throat, iritis, and affections of the periosteum and bones. You may see a patient with all these at the same time; the secondary, if we may use the expression, overtake the primary symptoms,—they come on before their time. There are other instances in which the appearance of the secondary symptoms is more protracted, in which they do not show themselves until considerably after the time at which we should usually have expected them. And there are some instances in which a very long period elapses between particular symptoms of the venereal disease, and others that come on next in order.
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Now it happened to me, not long ago, to have a patient who had a venereal eruption all over his body. The character of it was so strongly marked that I had no hesitation whatever in asking him immediately how long it was since he had primary syphilitic disease. Well, the truth was, it was so long that he had forgotten it, and he was surprised at my inquiry. It turned out to have been fourteen months; the primary syphilitic affection had got well fourteen months before. I saw another instance in which nearly two years had elapsed between the primary sore and the syphilitic eruption which was the consequence of it. I had occasion to see a gentleman who had been under my care for a primary syphilitic sore, and subsequently for a sore throat consequent on that, and this gentleman had married. He had married about twelve months after he had recovered from these symptoms. He came to me in about three years and a half after the period of his marriage, and he had then got syphilitic symptoms of a very well-marked kind, which had recently occurred. These were easily cured, but there could be no doubt as to their syphilitic character. It has lately happened to me to see two instances of sore throat, that I could not have hesitated at all in calling syphilitic, if I had looked at the throat alone, and considered that without reference to any other circumstance in the case. One was the case of a patient in this hospital, and another that of a gentleman who consulted me in private. Those were both individuals in whom you could not account for the ulceration of the throat in any other way; and I think in one there had been no syphilitic appearance for eight years, and in the other as much as ten years had elapsed. There seems, therefore, to be considerable latitude with respect to the time that may elapse between the appearance of primary and secondary symptoms, and there may also be considerable difference in different individuals. And really I feel myself unable to point out a limit, or to say what length of time may be considered as absolutely necessary for securing a person from the recurrence of the disease. I know that some would say, particularly with respect to the two or three
last instances I have mentioned, that those could not be regarded as syphilitic, that, judging from the length of time, they must have arisen from some other cause. Now, I do not know from what ground that assumption proceeds. If six or twelve months may elapse between the primary and secondary syphilitic symptoms, or between two particular effects of the venereal disease,—if six or twelve months may elapse, I do not know any reason why two or three years, or a still greater number, may not intervene. It is only a question of experience. I can only say, as to those cases I have mentioned, that I was fully satisfied of their syphilitic character; and I do not, therefore, feel able to define the time after which we should say an affection cannot be syphilitic. The occurrence of constitutional symptoms is very commonly preceded and accompanied by a considerable degree of feverishness of the constitution. In this respect there is a good deal of analogy between constitutional syphilis and the generality of exanthematous diseases, for the constitutional symptoms more or less show themselves by eruptions of some kind on the skin; and in some cases the febrile disturbance of the system is very strongly marked.

I have already detailed to you, generally, the symptoms which make up constitutional syphilis, and I need not go over that ground again; I have now to explain to you their particular varieties. In the first place, then, we have various forms of cutaneous eruptions: scaly syphilitic eruption is one of the most common. The skin, before the eruption appears, exhibits a kind of mottled or marbled appearance all over the body. If you strip the patient, though the skin is seen in the natural state, yet there is a streaked or mottled appearance underneath; there are little patches of red, appearing through the cuticle, which give it that appearance. Very soon you observe small spots of a reddish brown, or what would be called a coppery colour, on the skin; and this has always been the marked character of venereal eruption. These reddish brown superficial discolorations of the skin soon become more deeply coloured. The cuticle covering them
desquamates a little, becomes scaly, and the cuticle separates. The spots increase in size; they often run together, so that you have considerable patches of the skin in various parts of the body assuming this colour; in the end, these discolorations generally are large in size, and particularly vivid. They have a bright coppery-red colour; and the cuticle over them becomes very scaly. They are very strongly marked when they occur in the palms of the hands and soles of the feet; then the contrast of the colour of the diseased with the healthy skin is very strong; and the cuticle, being thick, cracks, and assumes a whitish appearance; so that the character of a venereal eruption of this kind is very strongly marked in these parts. It is what would have come under the description of that which Willan and Bateman call syphilitic lepra, for syphilitic psoriasis; and very frequently syphilitic eruption exhibits itself in the tubercular form. In the scaly form, which I have just mentioned to you, the discoloration is superficial, and the coppery-red spots do not rise above the level of the surrounding sound skin; but, in the tubercular eruption, you have a small kind of eruption, with the point more raised, and as that proceeds, the cuticle goes into the scaly state; so that that is, in fact, a scaly eruption, although there is a tubercular elevation of the cuticle in the first instance. In other cases, there is a more acute action of the skin—active inflammation, with the formation of inflamed pimples, or of papule, as they are technically termed. These arise in clusters and patches in various parts of the body; after remaining for a certain time they vesicate and suppurate, and that suppuration dries up, and they go into a scaly state, and you have a succession of those pimples forming over various parts of the body; this is called papular venereal eruption. There is another form in which you see it—where pustules, that is, inflammation of the skin, take place, effusion occurs, and the cuticle is elevated into inflamed pustules; these proceed, and form venereal ulcers—that is, the pustular venereal eruption. These are the principal forms of eruption that you observe, as secondary symptoms of syphilis: a
scaly syphilitic eruption, which may be called syphilitic lepra, or syphilitic psoriasis, a tubercular eruption, a papular eruption, and a pustular eruption proceeding to ulceration.

Now you do not find these eruptions always distinct; frequently they are so, but sometimes the different characters of the eruptions are united; that is, you will find an eruption partly tubercular and partly scaly, or you may see a mixture of the pustular with the scaly; in short, you do not find them invariably existing in their separate and distinct forms.

The pustular eruption spreads into ulcerations; the cuticle, which has been elevated by lymph or pus, gives way, and the fluid which is discharged encrusts upon the surface. The skin ulcerates under that encrustation; a greater discharge of matter takes place, and the encrustation is increased. If the part be kept moist, you then see an ulcer; but if you leave it exposed to the air, the matter concretes in the way I have mentioned, and the part is covered with encrustations more or less thick. The ulcerations thus formed are superficial sores, generally of a circular shape, and rapidly healing. In other instances, they degenerate into very foul and intractable ulcerations of a phagedænic character. Very generally they retain the circular form, and we find that they heal up in the centre, but not towards the edges; that there is a healing up in the centre, and a very foul or tawny margin by which the ulceration extends. Frequently the sores are of a crescent shape; that is, they have a convex edge by which they extend, whilst they heal up at the concavity. Sometimes the phagedænic edge is simply of a tawny colour; at other times it is considerably elevated, and almost sloughy, with a very red, angry, and fiery state of the neighbouring skin. There is a considerable variety in the characters of those syphilitic ulcerations of the skin, all which originate, in the first instance, from a vesicle or pustule.

The skin is also liable to other affections dependent on venereal disease: ulcerations take place of a secondary character, in the skin, about the arms; and there they very commonly have an ele-
vated margin, with somewhat of an indurated base, something like the indurated syphilitic sore. At other times, the ulcerations about the margin of the anus have the appearance of fissures or chaps; and the natural folds of the skin about that part seem to give rise to the particular form which the old writers call *Rhagades ani*; that is, a cracked, ragged, and ulcerated condition of the parts about the anus. The skin at the roots of the toes, and the skin on the surface of the toes opposite to each other, often go into a state of foul ulceration, with elevated surfaces, and a copious, thin, and very offensive discharge takes place from them: that form of ulceration has been called *Rhagades digitorum*, chaps of the toes. The parts which are the seat of primary syphilitic sores, more especially in females, often produce warty excrescences, which sometimes have an extensive surface, and they are called *condylomata*. These are, perhaps, hardly to be regarded as syphilitic; occasionally they are the result of irritation in the skin, in consequence of syphilitic disease affecting the neighbouring parts.

In conjunction with these affections of the skin, we not unfrequently have inflammation of the iris taking place; and that is a form of disease which may occur in conjunction with various forms of syphilitic eruptions—we may have it either with the pustular, or with the scaly syphilitic eruption.

Then, either together with the affections of the skin, or shortly after them, or independently of them, it is not uncommon to have various ulcerated affections of the fauces, or mucous membrane covering the neighbouring parts—sore throat. In the first place, there is a form of ulceration principally observed in the tonsils; there is a deep ulcerated excavation taking place in those parts; a destruction of the substance, without any attempt at reparation; a loss of substance as if a part had been scooped out, the surface exhibiting a tawny appearance, as if covered with a stratum of thick yellow matter; these have been called by foreign writers, lardaceous ulcerations, as

* Rhagades digitorum, from ἱππὸς, which signifies to break—chaps or chil-blains.—Ed.
if they had been covered by a stratum of lard. These are principally observed in the tonsils; but you may observe the same kind of affection running along the outside of the palate—along the edge of the uvula. And you will find that this ulceration will occur with very little apparent disturbance of the mucous membrane generally, hardly any thing like inflammation about it; nor is there any thickening or considerable pain observed: sometimes it is found to have proceeded to a considerable extent before the patient is aware of its existence. It has been chronic, without any great disturbance. Frequently, however, there is a much more active disturbance of the mucous membrane of the throat, which becomes red and swelled, secreting more mucus than usual; a good deal of discharge filling the throat, and a superficial ulceration with white patches, superficial spots extending over the velum palati, or superficial ulceration of the tonsils. Again, the throat may be the seat of a very formidable phagedænic ulceration; that is there may be a destruction of the substance of the mucous membrane; it may have a sloughy, or, at least, a phagedænic character, with a bright-red appearance of the surrounding portion of the membrane, and occupying, particularly, the upper and posterior part of the pharynx, reaching above the velum palati, and extending further downwards than you see by inspection externally. Frequently ulceration is not confined to the throat, but it may take place also in various parts of the tongue, or in the mucous membrane of the cheeks, or of the lips. Sometimes there is a state of ulceration of the mucous membrane of those parts. Sometimes the mucous membrane is thickened, raised into a kind of irregular swelling. The limbs, the joints, and bones, are also the seat of various affections connected with syphilis.

In the outset of constitutional symptoms, it is not uncommon for patients to complain of severe pain of the limbs generally, and of the joints, without our being able to observe any particular swelling, or obvious deviation from the natural state of them. In the more advanced stage of syphilitic affections, however, we find severe pains in the central portions of the limb—not in the joints,
but in the intermediate parts; and we then usually find, that swelling takes place either in the bones, or in the periosteum covering the bones of the limb. Sometimes the swelling is of that hard incompressible nature, that we can have no doubt of the bone being in a state of inflammation; sometimes it is, although firm, of a more yielding kind, and such as is calculated to lead us to suppose the periosteum is the seat of the affection. There may be exostosis or periostitic forms of disease of the bones and their covering. In these cases it frequently happens, that patients complain little during the day, but the severe pain comes on during the night, which prevents them from getting rest, and goes off again in the morning. In some cases of this kind, there is a simple thickening of the periosteum, or swelling of the bones. In others there is a more active affection; the disease proceeding to suppuration, matter forms under the periosteum, makes its way out, and a portion of the bone perishes—syphilitic caries takes place, that is, the substance of the bone ulcerates, and perishes to a certain extent. In the more protracted cases of syphilis, it is not uncommon to have considerable swellings, with much pain in the joint. In the early part of constitutional syphilis, you have simple pain in the joints, but where it has been of long continuance, where the patient has been exposed to repeated attacks, inflammation of the synovial membrane of the joint occurs, and swelling of the joint itself, in consequence of interstitial deposition. These then, are the common appearances of constitutional syphilis, or lues venerea, as it is called: various eruptions of the skin; various ulcerations; ulcerations of the mucous membrane of the fauces, and of the neighbouring parts of the mouth; pains and swellings; pains of the limbs and joints; and swellings of the joints, periosteum, and bones; iritis frequently taking place in conjunction with affections of the skin.

There are other forms of secondary syphilis, which are less common. Sometimes the lining membrane of the meatus auditorius becomes inflamed, and a thick purulent discharge takes place from it, accompanied generally with deafness. Sometimes a
chronic swelling of the testicle occurs; the testicle becomes enlarged, becomes hardened, and is usually irregular and tuberculated on its surface, attended by considerable pain. Commonly only one testicle is affected, sometimes both. When the bones of the body are affected, it is not uncommon to have those of the nose and of the palate suffering. Probably the affection in the nose is in its nature similar to that which takes place in the shin bone; considerable pain is experienced in the part; the membrane covering it becomes ulcerated, portions of the bone come away, and fetid discharge takes place. Sometimes the affection of the throat spreads to the larynx; and this, in fact, is a very serious extension of the disease. When we see how close the mucous membrane of the larynx is to the mucous lining of the throat, which is so commonly the seat of syphilitic disease, we are, perhaps, rather inclined to wonder that this extension does not take place more frequently. It is, however, not a very common occurrence. Syphilis does, indeed, sometimes extend into the larynx, and sometimes necrosis—partial death of the cartilages of the larynx, takes place. The affection here is very serious, as all affections are in those parts where they are capable of interfering with the respiratory functions; it must be very serious—it endangers the life of the patient. Such are the various affections which make up constitutional syphilis or lues venerea. Now, we observe, in general, that these show themselves first in the skin; often, at the same time that they show themselves in the skin, they appear also in the throat, the eye being frequently involved, iritis being added, together with pains in the limbs and in the joints; that is the combination of symptoms which usually exhibits itself in the first instance, when the disease extends further than its primary seat. The bones, the nose, and the joints, are usually affected at a remoter period.

Mr. Hunter divides the parts affected by constitutional syphilis into two classes; he calls one the first order of parts, and the other the second order of parts. Those that I have mentioned to you first, he calls the first order; the bones, the nose, and the
joints, he calls the second order. He says constitutional symptoms primarily affect those of the first order, and subsequently show themselves in those of the second order; and, as a general observation, this may be admitted, yet it does not hold invariably true; for, as I have already stated to you, the secondary symptoms sometimes come on before the primary symptoms are gone; and occasionally the second order of parts is affected in the first instance. I saw, not long since, a gentleman who had a primary sore upon the penis, that had lasted a considerable time; the ulceration had extended through the reflected lining of the prepuce, upon the glans, and had burrowed under the skin of the penis. There was considerable induration; it had lasted a long time there, perhaps some six or seven weeks or more, and he had a swelling of the periosteum covering the side of the shin; that was the first appearance of the secondary symptoms in that case. I remember another case of a medical gentleman who consulted me, in which the first appearance of secondary symptoms after the primary, was a swelling of the periosteum of the frontal bone. You are to regard these distinctions, then, of first and second orders, as only true in a general sense, and as not being invariably applicable.

I believe, that I have omitted to notice one point to which I intended to advert, namely, the question, whether a syphilitic bubo can occur without any primary sore; whether the glands in the groin can become affected by syphilis, except in consequence of the previous existence of a primary sore on some part of the generative organs? This is a point that is not yet decided. I can only state to you my own belief, which is, that the glands in the groin may become so affected. I mean to say that we do occasionally see instances where chronic indolent swellings of the glands in the groin occur in individuals in whom we cannot trace any other cause for their occurrence; in individuals who have exposed themselves to the possibility of contracting syphilis, and where the employment of mercury in the form of friction on the inside of the thighs very often contributes to the dispersion of such swellings. I fancy the general belief is rather on the other side,
that a swelling in the glands of the groin, occurring independently of a sore or discharge, is not to be regarded as proceeding from syphilitic infection; and the point is to be considered as altogether doubtful.

I enumerated to you, and described the various phenomena which constitute what are called secondary symptoms of syphilis—lues venerea. Now all these do not occur in one individual, nor do they occur indiscriminately; but we are in the habit of seeing certain of these affections combined; they form certain groups, which exist either in conjunction with, or in succession to, each other, in particular instances. There does not seem to be any thing like an invariable coincidence of them in any individual; but we are in the habit of seeing that many of the appearances of both frequently do combine together, and that some of them do not, so that we can give a sketch of what occurs in particular instances.

I have already stated that Mr. Carmichael, of Dublin, conceived that certain secondary symptoms could be traced to certain primary sores as their origin; that a certain train of secondary symptoms might be referred to a particular primary sore, and that there was so much regularity in the connexion of these phenomena, that he considered himself authorized to believe in the existence of several forms or different species of venereal disease, to which he has assigned names. I may just mention to you, that the distinctions which he has adopted, and the names which he has given to them, certainly show that certain symptoms, both primary and secondary, are frequently conjoined; and, inasmuch as that is the case, I think we may very properly adopt, at all events, some of the names which Mr. Carmichael has given to those characters, without adopting, to their full extent, his notions respecting the different varieties of poison which produce them.

The indurated chancre—that sore which has been described by Mr. Hunter, and which, in consequence of his description, has been generally regarded by the profession since as more particularly deserving the name of syphilitic primary sore or chancre;
that indurated chancre is commonly followed by the scaly eruption, by the excavated and tawny-coloured ulcer of the tonsils, by pains in the shafts of the long bones, and by nodes formed on those bones. This combination of symptoms, Mr. Carmichael calls the scaly venereal disease, and it is that combination of symptoms which has been more particularly described by Mr. Hunter in his work on the venereal disease, and which, subsequently to his description, has regularly been assumed as constituting the true venereal disease or syphilis. Mr. Carmichael considers, that this form of venereal disease is particularly benefited by the administration of mercury, and that, in fact, the employment of mercury so as to affect the system, is the best treatment of this form of the affection, whether in its primary or in its secondary shapes. I should have no hesitation in agreeing with him on this particular point, namely, that the indurated chancre, the scaly eruption, the excavated ulcer of the tonsils, and the nodes on the shafts of the long bones, with severe nocturnal pains occurring in the same bones, are symptoms which do require mercury, and the removal of which, if not absolutely requiring, is much accelerated by the employment of mercury, so as to affect the system. We are not, however, to lay down the use of mercury, even in this form of the disease, in that same absolute and positive manner, in which it was heretofore regarded as a remedy for syphilis. The recent inquiries into the history of syphilis demonstrate, as I have told you, that all forms of the venereal disease can get well without the use of mercury; that syphilis is not that uncontrollable disease which proceeds to destroy the part affected, and then goes on from one part to another, with a progress essentially destructive throughout the system, till it destroys the individual in whom it occurs; these are notions decidedly erroneous, because the disease may go through its progress and wear itself out without mercury, in whatever form it may occur. We are to consider, therefore, that mercury, though the best remedy in treating the disease, is not such as that we are to persevere in the use of it at all hazards till we affect the system. Mercury acts, as I have told you, as a kind of
poison in some individuals, and produces very serious and very bad effects indeed. Heretofore it has been regarded as better that the individual should bear these ill effects, than that the syphilitic symptoms should go on; but now we know that the venereal disease does not produce those destructive consequences, we are not so imperatively called upon to persevere in the use of mercury, when its operation is essentially prejudicial to the individual who takes it. Under such circumstances, then, even in this form of the disease, we should relax for a while our employment of the mercury; we should allow the bad effects to subside; we should resume the use of it again, leave it off again, return to it again in smaller quantities than those which we had before given, and so forth. And we derive this advantage, at all events, from the recent inquiries, namely, that we need not expose our patient to the injurious effects which mercury is capable of producing, as we may lay it aside, and trust, at all events, for a time, to the employment of other means.

The second form of venereal disease described by Mr. Carmichael is, what he calls the papular venereal disease; I should have mentioned to you before, that Mr. Carmichael characterizes the disease chiefly by the form which the eruption assumes; he considers the eruption as the circumstance most characteristic in the natural history of the affection; and we certainly find that this is true in many other cases, as in small-pox, cow-pox, and so forth. He says, that the papular eruption follows either the superficial venereal disease, which is unattended with induration of the basis or elevated edge; that it follows simple gonorrhœa, and that it also follows a primary affection which I have not yet mentioned to you, that is, an excoriation of the prepuce and glans, with puriform discharge. This is a kind of primary affection, with respect to which one is under some doubt whether it ought to be referred to gonorrhœa or syphilis. We find, however, that occasionally the lining of the prepuce and covering of the glans penis becomes inflamed, red, thickened, excoriated, superficially ulcerated, and that there is produced a thin, purulent, and generally strong-smelling
discharge: this has sometimes been called gonorrhœa preputii—gonorrhœa of the prepuce; and with that affection we not uncommonly find an indurated venereal sore on the prepuce, at the reflection of the lining over the glans penis: at all events, we find an excoriation without being able to say that it is actually in a state of ulceration. Now these three forms of the primary venereal affection—the superficial sore without elevated edge or indurated basis, the gonorrhœa preputii, or the inflammation and gonorrhœa properly so called; these three forms of the primary affection, according to the experience of Mr. Carmichael, are very commonly followed by papular eruption of the skin, by inflammation of the mucous membrane of the fauces, with superficial ulceration, by particularly severe pains of the joints and limbs, without swelling of the periosteum of the bones, or swelling of the joints themselves, and considerable pains in the chest and back. The papular eruption is a tolerably acute inflammation of the skin: it consists of the formation of a number of pimples of a bright red colour; that is, it consists of a number of minute patches of active inflammation of the skin; and when these exist all over the body, you will not be surprised that they produce considerable febrile disturbance—that there is a full pulse, pain of the head, thirst, a white tongue, disturbance of the digestive organs, and considerable pain in the limbs and joints. This, in fact, is a rather more active inflammatory disturbance of the system, than that which is observed in the scaly venereal disease; although I may observe to you, that the appearance of constitutional symptoms of syphilis, whatever form they may assume, is usually preceded by more or less of febrile constitutional disturbance. The symptoms that I have just mentioned to you of course require a pretty active antiphlogistic treatment; sometimes venesection, at all events active purging, and the administration of saline and antimonial medicines afterwards, low diet and rest; and they neither require, nor are they benefited in the active inflammatory stage, by the employment of mercury. Indeed, this papular venereal eruption will go through a certain course much like the other active inflamma-
mations of the skin, the small-pox, measles, &c. The pimples very commonly vesicate, or form a little pus at the point, the inflammation then subsides, the vesication dries up, a little desquamation takes place, and the inflammation entirely disappears. You may have a succession of these pimples; you may have patches of them forming on various parts of the body, and you may have some difficulty in removing them; however, the progress of the complaint leads to a natural cessation ultimately. The eruption comes to an end of itself often, independently of the employment of any particular means: you watch the symptoms, and you hasten their termination by the antiphlogistic treatment suited to the state of the system. There is no necessity for the employment of mercury generally in these cases, except towards the decline of the affection, and then you sometimes accelerate the cure by the moderate employment of it—by the blue pill, or Plummer's pill, in moderate doses. This form does not, like the former shape of the affection, require the regular and active administration of mercury. I may observe to you, however, that when iritis occurs, which it often does, in conjunction with the papular eruption, and in conjunction also with the scaly eruption, that it then usually requires a considerable and pretty active administration of mercury, within the space of a short time: this is a point, however, that I shall have occasion to advert to more particularly when I come to treat of affections of the eye.

A third well-marked form of the ulcerative venereal disease is that which Mr. Carmichael calls the phagedænic form, where the primary form has the phagedænic character, and where the affection of the skin in the secondary stage consists of tubercles, which proceed to ulcerations, and which form ulcerations possessing also the phagedænic character—spreading by phagedænic margins, where the sore throat is of the same character, exhibiting phagedænic ulceration, more particularly at the back part of the pharynx, and where there are very troublesome and obstinate affections of the bones and of the joints. These affections, both primary and secondary, are attended with very considerable pain, and, generally
speaking, the sufferings throughout these affections are very consider-able; so much so as to wear out the strength of the patient, and very seriously debilitate the constitution. Hence it happens that, inasmuch as these affections show great tendency to relapse—inasmuch as they occur again and again—inasmuch as they present some of the worst cases in which the powers of the system are most reduced, we see the greatest difficulty in conducting the patient to a cure. Examples of this kind of disease, I have already intimated to you, show, generally, that mercury is not a proper remedy in cases of phagedænic affections; that the general employment of it usually exasperates the disease, whether in its primary, or in its secondary form; therefore, we are not to think of the employment of mercury carried to the state of affecting the system generally. I think there can be no doubt that the prejudices of many who are opposed to the use of mercury, have probably arisen, in a great measure, from the effect of the injudicious use of it, in cases of this kind. Under the notion that mercury was a specific for syphilis, it has no doubt been exhibited in phagedænic, as well as in other forms of the disease. Long courses of it have been used in the phagedænic form, because the symptoms would not yield, and have been rather exasperated by the remedy. The symptoms have occurred again and again; mercury has been had recourse to as often, and thus, by the serious nature of the disease, and partly by the injudicious use of this powerful remedy, patients have been brought into a state of great weakness, and no doubt, in many instances, their lives have been lost in consequence. In the phagedænic form of the venereal disease, we generally have recourse to the employment of narcotics, for the sake of soothing the severe pain which accompanies the disease. We use conium, hyoscyamus, opium, and Dover's powder; but when the suffering is very considerable, I believe the general experience of the profession is, that opium is the only remedy of this kind on which we can confidently rely, so that we are generally obliged to resort to the employment of opium; and when we use it in cases of this kind, I think we shall find it necessary, not merely to exhibit a
single dose at bed-time, but to employ it at regular intervals, so as to keep up the effect on the system. A grain of the crude opium, or five grains of the pilula saponis cum opio, may be exhibited every eight or six, or, in very bad cases, four hours. In instances where we do not require this very free administration of it, we may give a dose of Dover's powder—ten, twelve, or fifteen grains at bed-time, or a few grains of the pil. sap. cum. op. at night, and, if necessary, a few times in the course of the day. In conjunction with this, we may find advantage from the employment of sarsaparilla. If sarsaparilla possess any virtue, I think it must be beneficial in cases of phagedænic venereal disease. These are the cases in which the general powers are considerably depressed, and it is in such cases that we find the efficacy of sarsaparilla most clearly exhibited.

Although mercury employed internally is prejudicial in the phagedænic form of the disease, the same objection does not, in my opinion, exist with respect to the employment of it locally; and, in fact, I do not know any form of the affection in which the treatment by mercury locally, in various forms, is not advantageous. The black wash, the yellow wash, and, perhaps, more particularly, the cinnabar fumigation, may be used; the latter is a very eligible form of the remedy in many instances of obstinate and serious ulceration of the fauces, where you cannot apply mercury in any other form. In the intractable phagedænic ulceration of the skin, which is so common, the yellow wash is a very advantageous application. Now it has happened to me, sometimes, to see the cinnabar fumigation applied to the throat, simply with a view to the local influence of the remedy on the ulcer there, produce ulceration in a very powerful degree. In many instances where I have seen this, I have found that the local disease in the throat, and sometimes that the local disease in other parts, has proceeded very favourably. So that I would not lay it down that mercury is absolutely, in no instance, to be employed as it regards its general effect on the system in those cases; indeed, those cases are so obstinate and intractable, that sometimes we find we do
not succeed by the remedies we consider, from general experience, the most suitable, and we are obliged to resort to others. Gentlemen who have acquired very great reputation in the practice of their profession, I have seen repeatedly go upon the rule in consultation, that where a person had taken a great deal of mercury, and had not been benefited by it, they have changed the remedy, and said, You must not go on with it, but use sarsaparilla and other medicines; and, on the contrary, where those other medicines have been used without advantage, they have said, You must discontinue them, and have recourse to the employment of mercury; and really we are obliged to do so in some of these cases. We must use mercury internally in some of the phagedenic cases; but, in doing so, we must use it very cautiously at first, we must give it in very small doses; but I would not go to the extent of saying, that you are never to use it at all, even to the extent of affecting the system.

Mr. Carmichael also speaks of a fourth form, the pustular, but he does not speak of this form of it very confidently, nor as if he had fully established, in his own mind, the existence of it; and therefore I need not trouble you with any observations on what he says respecting it.

Now, with respect to the three distinctions, the scaly, the papular, and the phagedenic forms, I think that those cases of them which may occur to you in practice, will very nearly bear out the appearances which Mr. Carmichael has described, and you will recognize this in them, that his descriptions must have been founded on the results of actual observation. Yet I do not feel myself prepared to go to the length he has done, in saying there are so many distinct poisons producing the effects, because there is not that consistency observed in the combination of the symptoms I have mentioned to you which is seen in the other affections of the body, measles, small-pox, &c.; in the first place, we do not feel that clear kind of distinction between the various primary symptoms which Mr. Carmichael assumes. We sometimes see sores of different characters existing in one and the same individual. Sometimes we
have a superficial venereal ulcer, and an indurated sore, occurring in
the same person. You may often have a sore, of which one part is
indurated and the other is not. The truth is, that that particular
form of induration varies in some respects according to the texture
which is affected, for we do not find that induration when the sore is
seated in the glans penis. We do also find that there are combina-
tions of the eruptions. You will see tubercular and scaly eruptions
occurring in the same individual; you may see a scaly eruption
with phagedænic ulceration in the same person. The distinctions,
therefore, that have been laid down by Mr. Carmichael, are only to
be taken in a general sense, and not to be taken as strictly and ac-
curately true under all circumstances. But the particular rules of
treatment which he has laid down, appear to me to be very judi-
cious; and I think you cannot, on the whole, have a safer guide in
point of practice than the book which he has written. Now, having
mentioned to you, with approbation, this work of Mr. Carmichael,
I would also recommend to you another work, of still more recent
date, as being well worthy of your attention; it contains a very ex-
cellent relation of facts on the subject, judiciously arranged, and the
various doctrines are discussed in it with the advantage of consider-
able personal experience, in a very rational way—I mean, the
Treatise on Syphilis by Mr. Bacot.

The affection in the meatus auditorius externus, the inflammation
there, with purulent discharge, is by no means a common occur-
rence in syphilis; it is only seen occasionally, and then not very
strongly marked. I have only seen it occasionally where it has
been necessary, with other concomitant circumstances, to employ
mercury, and I have found that the discharge from the meatus au-
ditorius externus, together with the disturbance that has accompa-
nied it, has yielded very favourably to mercury.

The affections of the bones and joints that occur in some individ-
uals are often very tedious and very troublesome. The majority
of instances, I fancy, of what we call nodes, are inflammations of
the periosteum of the bones affected. Sometimes this inflammation
is of an active kind, attended with external redness, and proceeding
to the formation of matter. Generally speaking, however, it is a mere indolent and chronic swelling, and it is particularly troublesome in consequence of the severe pain which accompanies it. Proceeding on ordinary principles, we should say that, under certain circumstances, it would be benefited by the application of leeches and, where it is more active, by poultices. I do not know that, in general, we find the application of leeches very useful in these instances, although I would not venture to assert that that is not a mode of treatment we ought to employ in certain cases. When, however, the inflammation proceeds to suppuration, we do not find that much matter is formed; but when tendinous parts are concerned, or when the formation of matter occurs under the periosteum of the bone, we find that free incision, so as to liberate the matter, is attended with marked advantage; therefore, where we have tried other remedies without giving relief, an incision through the inflamed and swelled parts down to the bone, so as to set the matter at liberty, very frequently puts an end to the patient's sufferings.

In the more chronic forms of this affection the mercurial plasters may be employed with advantage externally, with the internal use of the pil. submuriat. hydrarg. comp.; but, when this occurs as a symptom consequent on syphilitic disease, as well as in other cases, we no doubt shall find the most advantage derived by the employment of mercury, so as to affect the system. Seeing the efficacy of mercury in many of these cases, I am rather surprised at the opinions that have lately been given by many practical persons, namely, that the employment of mercury gives rise to these affections; that these nodes on the bones actually owe their origin to the employment of mercury. I must acknowledge that this is contrary to my own experience; it appears that that particular form of the disease results from particular primary forms, as in the cases of eruptions or any other characters of syphilis; but, independently of that where nodes, that is, inflammation of the periosteum, arise independently of syphilitic affection, I do not know any more powerful mode of combating them, after the use of antiphlo-
gistic means, than the employment of mercury, so as to affect the system. The affection of the joints generally takes place in the protracted states of syphilitic disease; and some of the most troublesome of those cases occur in the advanced periods of phagedaenic syphilitic disease. You frequently find the synovial membrane of the great joints, such as the knee-joint, swells, and that the joint itself enlarges from the deposition that takes place. You might infer that the local abstraction of blood by cupping, or leeches, would be of advantage in such a case. Sometimes it does good, but you cannot rely, under such circumstances, upon the abstraction of blood as a means of alleviating the affection as fully as you could when the joints are the seat of the affection, and when the synovial membrane becomes inflamed from other causes. I think blistering is most beneficial in those cases; and blistering is also resorted to with advantage in the cases of obstinate venereal affections of the periosteum. In reference to these pains in the joints, and of the limbs generally, and also to the venereal eruption, much good is, in many instances, derived from the warm bath, and this is a remedy which may be combined with any of the other modes of treatment to which we are in the habit of resorting.

The affection of the testicle is not one of the more frequent forms of the syphilitic disease; we see it occasionally. I do not know that this affection of the testicle occurs particularly in conjunction with any of the forms of the disease I have mentioned, though I think we seldom see it alone; we usually find it occurring with some other secondary symptom, and the co-existence of it tends to assist our diagnosis. The affection of the testicle consists in a moderate enlargement of it, with induration, general enlargement and swelling, so that there is a kind of knotty enlargement existing, with no very active inflammation, no redness of the scrotum, nor is the testicle very large. I think I have invariably found that this particular symptom is removed most effectually by the employment of mercury.

The affection of the nose, like that of the bones, has been considered of late, by those who have entertained strong notions against
the use of mercury, to be an effect resulting from the administration of mercury. Now, I believe, no one has ever heard any body say that he has seen an affection of the nose arising in persons who have employed mercury for any other purpose than that of overcoming the venereal disease. I have seen affections of the nose arising in persons who have employed mercury for the venereal disease, to no very great extent; so that I do not participate in those opinions which ascribe this effect to mercury, although one may usually look to this, as one of those forms of disease which may be rendered more severe by the injudicious use of the remedy. I think, in general, the use of mercury does not do good where the nose is the seat of disease, and that sarsaparilla and narcotics are the means that should be resorted to, together with a lotion of the corrosive sublimate in distilled water or lime water—that treatment is the safest mode of proceeding.

With respect to warts, as connected with syphilitic disease, we do not find it necessary to resort to the employment of mercury in the treatment of them; they are to be regarded in this, as they are in other cases, the result of simple inflammation of the parts; and therefore their treatment falls under the general rule of treatment applicable to warts under other circumstances.

There is one other form of the venereal disease still remaining; that I have to speak of to you, and that is syphilitic disease as it occurs in infants. This is a form of the disease not arising in the way that the disease does in the adult, through the medium of sexual intercourse. Syphilis is communicated to infants through the medium of the circulating fluids of the mother; the syphilitic poison is conveyed to the child in utero by the blood of the mother, and the child is sometimes born with the effects of the poison visible on it at its birth, but more commonly the result of the affection becomes apparent in a few weeks after birth—four, five, or six weeks, or even a longer period. The affection as we see it in infants is very strongly marked; it is so peculiar that, in my opinion, it cannot be confounded with any other. The sores and the nature of the disease appear to me equally clear and unequivocal; and hence
I must acknowledge, that it seems to me very strange that Mr. Hunter, who appears to have seen a very great number of well marked instances of it, should have put it down in the chapter of his book in which he speaks of diseases resembling syphilis, but which are not syphilitic. In the first place, this affection of children only arises where they are born of mothers that have actually laboured under syphilis; and the disease itself, in the infant, presents the strongest analogy to syphilitic disease as we see it in the adult. The disease which thus appears may be communicated from the child to a healthy woman who suckles it; and the disease thus produced in the woman is capable of affecting other individuals. And lastly—what I should have supposed would have been the strongest argument with Mr. Hunter in favour of its syphilitic nature—it is curable, and most easily and decidedly so, by the employment of mercury. That is Mr. Hunter's great criterion, in general, for deciding whether a complaint is syphilitic or not. If a disease gives way easily under mercury, he argues that it is syphilitic; if not, he argues that it is not syphilitic. Therefore this affection of the infant is one that would come under his idea of syphilis in all its circumstances: the origin of the affection, its nature, the way in which it can be communicated from one individual to another, and the mode in which it is cured—all concur in shewing that the affection is in its nature syphilitic.

Now we naturally ask, in the first instance, whether this affection in the child proceeds from the primary or the secondary form of the disease in the mother? So far as my own opportunities of observation and inquiry have gone, I should say that it is produced, not by the existence of the primary, but by the existence of the secondary, disease in the mother. I do not mean to say the existence of primary disease in the mother may not produce it, but in the majority of instances, I think we find it seems to have owed its origin to the secondary or constitutional form; and, in fact, the disease, as it appears in the child, does not bear the characters which would constitute a series of symptoms that we should regard as primary in the adult. I remember the instance of a young
female about sixteen years of age, who was in this hospital, a patient of mine, being then far advanced in pregnancy—about the sixth month—at all events as far as that, and who had got very obstinate chancres, for which I had to employ mercury so as to sallivate her, and which I did freely. I may observe here, that that was done without having had any effect on the offspring. I am not sure whether she had any secondary symptoms before the birth of the child or not, because she did not continue to remain under my care; but knowing that she was in the family way, I was interested in the case, and I told her when she left the hospital, to bring the child, and let me see it in a month after it was born. She brought it, and it was then perfectly well and healthy. I told her to bring it to me at the end of another month: and she came a fortnight sooner with it, poxed all over, and she herself had got a syphilitic affection of the throat, and was ill altogether. Now this is the only instance that I have got, of primary disease alone appearing in the mother where the infant was affected, but yet I cannot say that she had no secondary disease before the birth of the child. There is another case mentioned by Mr. Hey, of Leeds, in a paper in the seventh volume of the Medico-Chirurgical Transactions, entitled, "Facts illustrating the effects of the Venereal Disease on the Child in Utero, by William Hey;" and it appears, from what he there states, that the disease originally arose from secondary symptoms in the mother; and I observe that he introduces a question, which I have also submitted to you in a former lecture, namely, whether syphilis can be communicated from the husband to the wife by cohabitation, when the husband labours under the secondary or constitutional form of the disease? And he is of opinion, although he is not able to state any positive facts to support him in that opinion, that the disease may be so communicated, that the husband labouring under secondary symptoms may, by cohabitation, communicate the disease to the wife; and I acknowledge that that also is the impression on my own mind, from the circumstances that have come under my observation.

Children that have received syphilitic affections in utero, are Appearance at birth.
sometimes born with the cuticle desquamating and peeling off, all over them; in a desperate state, weak, emaciated, and just ready to die, in fact. Such is the form in which syphilis exists at the time of birth. But more commonly the children are born healthy, and a few weeks after birth begin to exhibit symptoms of the disease;—redness of parts, excoriations, superficial ulcerations, and sometimes vesicles, or pustules, show themselves about the anus and the external organs of generation; and this affection, which commences in these parts of the skin soon after they are born, gradually extends all over the body; thus, in a short time, you will find that the child exhibits over the whole of it patches of a coppery-red discoloration of the skin, sometimes large in quantity, and sometimes small; that those patches go into a slight scaly state, and that the cuticle desquamates or separates from the whole of the body, sometimes without any manifest previous inflammation; but you will find it separating over the whole body, even to the palms of the hands and soles of the feet—peeling off from the whole frame. You will see those patches of light coppery-red discoloration of the skin particularly large and vivid about the face, so that the child's face has a nasty scabby appearance. You will observe ulcerated fissures at the corners of the mouth; aphæ of the mucous membrane of the mouth; a soreness and raw state of the eyelids. You will find that the nostrils become inflamed, and that a thick, viscid, yellow secretion stuffs up the nares, so that the child has generally a kind of snuffling about the nose; and when you come to look at it, you will see that the nostrils are completely plugged with that thick, yellow, offensive matter. In conjunction with these symptoms, you find, as you would naturally expect, that the child loses flesh—becomes shrivelled and wrinkled—miserably emaciated, fretful, and irritable, and exhibits marks of the most unfavourable constitutional affection; and, in fact, if the complaint be not relieved, the infant very soon goes off.

It has only happened to me in two instances to witness iritis as a symptom of syphilis in the infant. I have seen two instances of that, but all the other cases I have seen, and I have seen a great
number, have consisted of more or less of the symptoms I have just mentioned to you. Sometimes there are particularly marked indurated ulcers about the anus; that is, superficial ulceration, with elevated edges, and rather an indurated base.

The treatment of these cases is very simple. You must administer mercury; and, fortunately, these young subjects bear the administration of mercury very well. Half a grain, or three quarters of a grain, or a grain of calomel may be given night and morning; or four or five grains of the hydrarg. cum cretâ may be given night and morning, and this simple treatment accomplishes all we wish. You will find that under this treatment the local symptoms I have described very rapidly become better; ulcerations, if they have been produced, heal rapidly; the scaly eruption of the skin goes off; the discharge from the nose ceases; the child recovers its flesh; and, really, in instances where children seem to have been so emaciated and reduced that you could not have expected any thing but dissolution, you will find, in a very short time, that all the symptoms are gone, and that the children gain health and strength. On the continent it appears to be the more general plan to administer mercury through the mother, and to affect the child through her medium. Now I have found the direct administration of mercury to the child answer extremely well, so that I have generally adopted that kind of treatment.

You should be aware that the syphilitic disease which I have now described to you, when it occurs in children, is capable of being communicated from children to sound women who suckle them; and that women who thus receive the infection are capable of communicating it to other persons; thus it is of great importance that those who are nursing a child under these circumstances, should be aware of the necessity of employing all the necessary precaution for checking the propagation of the affection.

The effect of the venereal disease, when it is introduced into the system of the mother, and when it thus influences the state of health of her offspring, is in some instances not confined to a
single birth, but it extends to others; and that in cases where the
woman has not received the infection immediately by sexual in-
tercourse, children at two or three different births have been af-
fected with it.

There are two or three instances of this kind related by Mr. Hey, in the paper that I have just alluded to. He mentions, that in the latter end of the year 1770 and the beginning of 1771, a blind woman, who gained her living by drawing the breasts of women during their confinement, became affected with ulcers at the angles of the lips, which were judged to be venereal. He found that she had drawn the breasts of a woman who was sup-
pposed to be labouring under the venereal disease. He treated these ulcers as syphilis, and they healed under that treatment. He observes, that several women whose breasts had been drawn by this woman became affected with syphilitic disease. He men-
tions one case in particular. Mrs. B. had her breasts drawn twice
by this woman, upon the death of her second child, which died of
the small-pox, and within three or four weeks afterwards per-
ceived a swelling of the axillary glands, and complained of sore-
ness in her throat. The swelling in the axilla was, no doubt, the
effect produced by this blind woman drawing her breasts. The gentle
man who saw the sore throat, deeming it to be ve-
neral, exhibited mercury, and it got well. During the treat-
ment she became pregnant, but continued the use of the mercury
during her pregnancy; and, at the end of seven months, she miscarried of a dead child. She became pregnant again in 1772,
continued to enjoy good health, and was delivered of a child, ap-
parently healthy, in February, 1773, which she herself suckled.
When the child was about six weeks old, an eruption, which Mr.
Hey judged to be syphilitic, appeared upon its legs and arms.
He put both the mother and child upon a mercurial course, giving
the former small doses of hydrar. submurias, and the latter
hydrar. cum cretâ. By that treatment, the child was in a short
time freed from the eruption, but continued to take the medicine
till the beginning of August. In October following, two or three
small ulcers appeared on the outside of the labia pudendi of the child, and on that account the mercurial course was resumed, with the addition of an occasional dose of hydrar. submurias. The ulcers were soon healed, but in May 1774, the nostrils became sore, and the integuments of the nose were also tender; at the same time the child grew hoarse. The mercurial course was repeated, and continued for two months. The child also took the medicines during part of the months of September and October; after which time there was no recurrence of disease. In June, 1775, this same woman bore another child, which was apparently healthy at its birth, and continued to be so for a few weeks. Blotches of a copper-colour then came out upon the skin, but soon disappeared, upon having recourse to mercurial medicines. After some time the blotches appeared again, and were accompanied with a small ulcer in the labium pudendi, as in the former case. The child was, however, completely cured by a repetition of the treatment, and remained well.

Now here you observe there is a succession of appearances, proceeding from 1771 to 1775; successive children of the same mother becoming affected by venereal disease, which she had received from the woman who had drawn her breasts; so that it had not been communicated through the medium of sexual intercourse.

Some time ago, I had occasion to see a case of affection of the breast, where there was a primary ulcer, with indurated base and margin, consequent on disease communicated to a nurse by a child that she was suckling; and the facts of the case that I have just alluded to may serve to illustrate the natural history of these affections. A lady, in the family way, called upon a poor woman, and told her that she was living in private; and observing a healthy child at her breast, she asked her to take her infant when it was born, and suckle it. The woman consented, keeping her own infant at the right breast, and the other at the left breast. The latter child was healthy at the time it was born, but she stated that, in a week or a fortnight after, she observed two small
blisters, as she described them, came about the organs of generation, the nose got stuffed, and the mouth became sore; in fact, the woman described clearly a syphilitic affection of the child. As soon as the child's mouth was affected, her own nipple got sore. The child took white powders, and the eruption gradually got better, but her own nipple remained sore. At the time I saw her (February, 1827) the infant had not got well, its skin had marks of venereal eruption over various parts of the body, and it was stuffed about the nostrils; the suckling still continued. The woman who nursed the child had a smooth, red, superficial ulcer upon the breast. The sore looked clean; in size it was nearly equal to a shilling. The substance of the gland about the nipple was indurated, forming a lump as large as an egg; there was also a superficial sore in the axilla, and a lump above it, which probably was a glandular affection caused by the primary sore. When I asked her whether she had any eruption or sore on any other part, she said she had not; but I found, by examination, a few small spots on the scalp, a few of a similar character on the region of the pubes, and two or three superficial ulcerations on the labia. These were the appearances that resulted as the secondary symptoms of the primary sores communicated through suckling. I gave her mercury in a moderate way. Her own child, which had taken the right breast, continued well; which was a singular circumstance. She had been suckling it for some weeks, at the same time that she nursed the diseased child, and though she was affected with constitutional syphilis, her own child did not suffer at all. By means of the remedies employed, both the child and nurse got better.

After a time, she passed the child on to another woman; she did not choose to go on suckling it any longer, and the child seemed tolerably well when the other nurse was engaged for it. I had first seen the child in February, and I saw it again in April. It was then mentioned that the child had been sent to another nurse, and that, a week before, a few small brown patches appeared on the anus and about the face, and that some discharge took place. The nurse's nipples had become sore, but it was
a mere common excoriation. The nurse that I first saw had then fresh appearances of a scaly eruption; the nipple to which the disease was originally communicated was well. On the 18th of July the second nurse called, to show me a sore on the breast; it was without granulation, about the size of a shilling, and had existed three weeks, not having been checked by the applications that were used. The child that had given her the disease had died of the measles, before I saw the woman on this occasion. On the 20th of July, this second nurse had a small reddish eruption thickly scattered over the hands, especially on the palms. On the 24th, the eruption was more marked, and spread over the hand, running half way over the fore-arm. She took mercury, and the symptoms disappeared; the sore on the mamma and the eruption went off. The second nurse was delivered of a fine healthy infant, about the 2d of April, 1828; and this child was brought to me on the 20th of July, covered with syphilitic eruption from head to foot. It consisted simply of red patches, principally on the body, with the cuticle peeling off. Those on the hands and fingers, and on the organs of generation, were deep red, and partly excoriated. The lips were chapped and scaly. This child was emaciated and fretful, and was fed by the hand, the mother having no milk. The child got well, but the mother died of phthisis.

Here you see there was a child giving the syphilitic disease to a healthy woman that nursed it; at the same time her own child, which was kept at the right breast, had no disease. The woman—that is, the nurse—had a primary sore on the breast, and an affection of the absorbent glands, eruptions over certain parts of the body, and appearances on the external organs of generation similar to what we should recognise as a primary syphilitic affection. This child is then put to another woman to nurse—the child then appearing well. The second woman has a primary sore on the breast; has an eruption occurring over various parts of her body; she then becomes pregnant, and is delivered of an
infant, who, in about four or five weeks, is covered with syphilitic eruption from top to toe.

Now, in these and a variety of cases of a similar kind, the evidence of the nature of the disease, of the mode in which it is communicated to the children, and in which these children are capable of communicating it to other individuals, are so clear, that I am quite at a loss to discover what the grounds are which have led persons to doubt the syphilitic nature of such affections; and I can say most decidedly, that the administration of mercury, in the way that I have mentioned, is the most efficient mode of removing these appearances.

Gonorrhœa.

The disease, gentlemen, which bears the technical name of gonorrhœa, and which common mortals call clap, is an inflammation of the mucous membrane of the urethra, attended with puriform discharge, which discharge unluckily possesses infectious properties; that is, it is capable of communicating disease to the mucous membrane of the urethra, or of the vagina, of a healthy person, when brought into contact with it. Gonorrhœa, then, is an infectious disease, and it is usually conveyed from one individual to another by sexual intercourse, but not necessarily so.

If you consider the etymological construction of the term gonorrhœa, it might lead you to form a somewhat erroneous opinion of the nature of the affection, more particularly with respect to the nature of the discharge. The word gonorrhœa, which is of Greek derivation, is equivalent to the word flux, *fluxus seminis*, in Latin; that is, discharge, or flow of the seminal fluid. Now, it is not of that nature; it is an increase, with an alteration in quality, of the natural mucous secretion of the part; an increase and altered quality of the mucous secretion, consequent on the inflamed state of the mucous membrane. In order to give a more significant name to it, some French writers have called it *blenorrhœa*, which merely means excessive flow of the mucous fluid. However, the term gonorrhœa is one so generally received, and the meaning of it is so well known, that I believe we need not attempt to change it for any other.
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I had occasion to speak to you, in describing syphilis, of what is called the poison, or virus; which produces that disease; so do we also recognise the existence of a poison, or virus, in the production of gonorrhoea.

A question has arisen, whether these two diseases, syphilis and gonorrhoea, are produced by one and the same poison, or whether they owe their origin to different poisons. I mentioned to you, that we knew nothing about the venereal virus, or poison, considered in the abstract, and I may now also observe, that we know as little about that which causes gonorrhoea, that is, we do not know at all what is the particular ingredient composing it, the particular nature of the gonorrhoeal discharge, or of the secretion from a syphilitic sore that is capable of producing those diseases in another person, when applied to certain parts. We only know, that a fluid, called gonorrhoeal discharge, and that a certain secretion from syphilitic sores, will produce these affections. We are not acquainted, therefore, with the poisons in the abstract; we only know of the poisonous or infectious secretions, as they are made evident in those cases. The question, then, respecting the identity or the diversity of the two poisons, seems to me to come to this,—whether two things, both of which are entirely unknown to us, are the same, or whether they are different. Now it is very difficult to answer a question of that kind. We may, perhaps, make it more clear, and bring it into a shape more susceptible of an answer, by putting it in these terms:—Is gonorrhoeal discharge capable of producing syphilis, and is the secretion of syphilitic sores capable of producing gonorrhoea? In this way it is reduced to a question of fact, which we might suppose could be answered with tolerable ease. Now if we see two effects that are perfectly like each other, we may naturally infer, that the causes which have produced them are similar; and, on the other hand, when we see two effects totally dissimilar, we may naturally infer a dissimilarity of causes. How does the case stand, then, with respect to the present question? Syphilis consists of ulceration, followed by a train of morbid appearances in various parts of the body, con-
tinuing a long time, sometimes several months. Gonorrhœa consists of inflammation of a mucous surface, that of the urethra or vagina, going through a certain course, coming to a natural end, and not attended with further effects than those which immediately occur in the parts concerned. These two diseases seem to me to be totally contrary to each other; and the natural influence in my mind, contemplating them in this way, is, that they must owe their origin to causes essentially different.

Those persons who believe that syphilis first arose about the time of the discovery of America, or of the invasion of Naples, are of opinion that gonorrhœa existed before that time;—that that was an old disease; and we should naturally suppose that the persons who hold that opinion, must think gonorrhœa depends on a poison different to that of syphilis; for if gonorrhœa existed previously to those periods, how did it happen, supposing the poison to be the same that produces syphilis, that syphilis did not also exist as long as gonorrhœa? The belief of the identity of the poisons seems to me quite incompatible with the belief that gonorrhœa is an ancient infection, and that syphilis is one of recent date. However, it does happen, that persons who believe in the recent date of syphilis, are still of opinion that the poison, producing the two diseases, are identical; and this was the case with Mr. Hunter. He is a great advocate for the identity of the poisons that produce gonorrhœa and syphilis. In fact, he says distinctly, that the two poisons are the same, and that the two different effects arise merely from the difference in the textures of the parts to which the poison may be applied; that is, if this poison be applied to a mucous surface, such as the urethra of the male, or the vagina of the female, it produces gonorrhœa; if it be applied to surfaces covered by cuticle, then it produces syphilis—primary syphilitic sores. Now if these were the only differences in the two cases, it appears to me that, in the first place, we should expect to find females, where affected with disease of this kind, almost invariably labouring under gonorrhœa, and very seldom under syphilis, because the poison is applied in them to the
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surface of the vagina; it may also be applied to some of the external parts of the organs of generation, but not necessarily so. Necessarily it is applied to the internal surface of the vagina, and we ought, therefore, necessarily to have gonorrhœa almost always produced in the female. We do not, however, find that gonorrhœa exists in a greater proportion in females than syphilis. Then, on the other hand, we should expect to find that syphilis would be found to exist much oftener in the male than gonorrhœa, for the poison is applied in the male to the surface of the penis and the glans penis, and it seems difficult to account for the introduction of the poison into the male urethra, yet we find that gonorrhœa exists to a great extent in the male sex. If, in the two cases, the poisons be the same, we should expect to find the two diseases existing together, for we might suppose them to be both acquired at the same time, especially in the female, where the poison is applied both to a secreting and to a non-secreting surface. Now we do occasionally find, that the two diseases exist together, but this is comparatively uncommon. Mr. Hunter* determined to bring his opinion upon this point to direct experiment, and he therefore applied, by the puncture of a lancet, the matter of gonorrhœa to the surface of the glans penis and prepuce. He has given a long detail of the experiment he made, the result of which was the production of chancre in the part, the subsequent occurrence of bubo, ulcerated sore throat, node, and so forth. If this experiment be admitted, it would decide the question; because, according to the experiment, the production of syphilis by the gonorrhœal discharge would be unequivocal. For my own part, however, I can only say, that in the narrative there are so many inconsistencies, that, in spite of the high authority of Mr. Hunter, I must withhold my belief; and I am in some measure encouraged in this by the fact, that attempts have been made to produce primary syphilitic sores from gonorrhœal matter, and to produce gonorrhœa from

“I am compelled to use the terms, Lues or Syphilis. Although used in a distinctive sense, I do not approve of them, for the poison is one and the same, but it has its grades of severity.”—Travers on Syphilis.
the discharge of syphilitic sores, which attempts have totally failed.

Mr. Benjamin Bell, of Edinburgh, recounts several experiments of this description—experiments in which gonorrhoeal discharge was introduced by inoculation with the lancet, and produced no effect whatever. He gives other instances also, in which the secretion of primary syphilitic sores was applied to the vagina of the female, and to the male urethra, and the secretion from a chancre was introduced by a small puncture under the surface of the male urethra. He found, in these cases, that disease was produced, but not gonorrhoea; in fact, chancre was produced—chancre which led to the occurrence of secondary symptoms, and required a long course of treatment for their cure. And here I may further observe to you, that Mr. Hunter's statement is by no means correct, that the application of any infectious matter, either to the vagina or urethra—that is, to a mucous surface, will produce not a sore, but discharge. The statement is incorrect; for we happen to know that chancre may take place within the orifice of the male urethra; and very troublesome it is when it does take place there. We know also, that it may take place within the vagina. The urethra, therefore, of the male, and the vagina of the female, are susceptible of the occurrence of syphilitic ulceration.

The general result, then, of the observations I have made to you, leads me to this opinion, that gonorrhoea and syphilis are essentially different in their natures; that the poisons which produce the two must be different; and that there is a much greater difference between the two affections than can be accounted for simply by the difference of the textures of the parts in which they are seated. I consider them to be totally different in their natures, and, consequently, that the causes which produce them must be equally different.

A certain interval of time elapses between the application of the infection and the occurrence of gonorrhoea, a few days. Gonorrhoea generally takes place sooner after the infection than chancre; but
it has been protracted for two or three weeks. In the first place a slight degree of heat, tingling, or uneasy sensation, is experienced about the orifice of the urethra. The margin of the opening swells and becomes red; that is, the lips of the urethra become tumid and red, and then very quickly the discharge shows itself. A thin yellowish fluid oozes from the urethra, soon increasing in quantity, becoming thick and yellow, sometimes having a greenish appearance, the pain and uneasiness increasing in proportion as the discharge increases. Together with these symptoms a very unpleasant sensation is experienced in making water. The passage of the urine over the inflamed surface of the urethra produces a sense of heat, burning or scalding, which has been technically called ardor urinæ—scalding in making water. This is followed by copious discharge from the urethra. The symptoms increase to a certain extent in violence, they last for a certain time, the pain begins to subside, the discharge diminishes in quantity, it goes away entirely, and thus gonorrhœa, if left to itself, will pursue a certain course, and altogether disappear; this process occupying a space perhaps of four, five, or six weeks. Sometimes, instead of disappearing entirely, the discharge diminishes in quantity, becomes of a less bright-yellow colour, and sometimes even colourless; the swelling goes off, the scalding in making water is lost, and nothing remains except this increased secretion. In this state the complaint may last a great length of time,—weeks, months, or even years; and is then technically called gleet.

Now, persons who catch a clap do not always get off so easily as this. What I have described to you is a sort of gentle clap; the symptoms are mild; it is a sort of middle case. But frequently the inflammation is very considerable; the glans penis swells and becomes of a bright-red colour; the lips of the urethra are particularly tumid and red; the prepuce swells, becomes cedematous, and goes into a state of phymosis; inflammation extends along the whole lining of the urethra to the bladder. In the mild case I have mentioned to you, it is found, by examination, that the inflammation of the urethra does not run further than about an inch
and a half or two inches from the orifice; and Mr. Hunter calls
that the specific distance. He seems to have had an idea, that in
clap the inflammation does not usually reach beyond the point I
have mentioned. However, the inflammation by no means ob-
serves this limit in all cases. It gets beyond Mr. Hunter's "spe-
cific distance," runs along the whole course of the urethra, and ex-
tends to the bladder, the mucous membrane of which becomes in-
flamed. This is followed by considerable pain in the affected parts.
The pain is felt severely in the region of the bladder and about
the perineum. The patient experiences painful erections. The
irritation to which the penis is subject, gives rise to those erections.
They are repeated frequently and attended with excessive pain.
More or less this is a symptom usually experienced in a clap. The
violence of the inflammation is sometimes attended with an effusion
of coagulable lymph, either into the interior of the corpus cavern-
osum, or into the corpus spongiosum urethrae. This is attended
with considerable pain, the penis being kept erect, it is called
chordee; it seems as if the organ was confined in a straight or un-
natural situation. The patient, when the inflammation extends into
the bladder, is tormented with an almost incessant desire to void
the urine. The act of voiding the urine is very painful. The heat
and irritation of the urethra by the passage of the urine are in-
creased to an almost unbearable degree. Under such circum-
stances, and inasmuch as the mucous membrane of the urethra is
swollen, the dimensions of the urinary canal are diminished, so that
the urine passes with difficulty through the urethra, comes out very
slowly, and of course the pain in discharging it is proportionately
augmented. This difficulty sometimes proceeds to such an extent
that the urine comes away in drops, and indeed the disease may
proceed to total retention of the urine. Under such circumstances
it happens occasionally, that some of the overloaded vessels give
way and blood is discharged. This is often attended with benefit,
for it tends to relieve the distended vessels of the inflamed mem-
brane.

Such are the circumstances which characterize clap in its worst
form. When the inflammation occupies the whole of the urethra, when it more or less involves the lining of the bladder, there is not, perhaps, a more painful state of suffering while it lasts than are the results of a gonorrhoea which runs to this extent. Then other cases again are particularly mild; they trouble the patient with very little pain, and there is only a little uneasiness in voiding the urine.

We next, gentlemen, come to speak of the treatment—how to cure a clap. It would be a very interesting discovery indeed, if any one could find out a speedy and effectual mode of accomplishing this. Medical and other students would feel greatly interested in the discovery; and a person who could cure a clap in a short time would undoubtedly immortalize himself. The ladies of Fleet Street and the Strand would be inclined to erect a statue to his memory. I believe, however, there is no very speedy mode of accomplishing the object, and that we are not able to diminish very much that kind of moral lesson which this suffering is calculated to convey. The treatment of the clap may be considered either as rational or empirical. When we proceed to treat it rationally, or on principle, we regard it as an inflammatory disease, and treat it by antiphlogistic means. In some of the bad cases which I have mentioned to you, it may be necessary, perhaps, to take blood from the loins or perineum, by cupping, or by leeches; to purge, to administer sudorifics and saline medicines, with antimony. The patient should be kept at rest in a recumbent position, and on low diet; in fact, altogether upon a pretty active antiphlogistic plan of treatment. After clearing the bowels actively, you may administer the liquor ammonii acetatis with nitre, combined with the super-tartrate of potass; or any of these medicines, combined with antimony, in pretty considerable doses, may be freely administered. Mucilaginous and diluent drinks should be largely taken, in order to dilute the urine and render it less stimulating; barley water, linseed tea, gum-arabic water. Alkaline remedies are found capable of assisting in this object, particularly the liquor potassae, which may be given in any of the vehicles I have mentioned; and, per-
haps, the best mode of administering it with a view to relieve the scalding produced by the passage of the urine is, to give ten drops immediately after each occasion of making water. If you merely give it at distinct intervals, the effect is lost; but if you give it immediately after voiding the urine, it will have an effect on the secretion before the patient wants to pass the urine again. If considerable pain remain about the bladder and urethra after you have adopted these measures, you will find it advisable to put the patient into a warm bath, the hip bath, and to administer a good dose of Dover's powder, or opium. When the pain continues very troublesome, you may occasionally relieve it by the local administration of opium in the form of injection. In a mild case of gonorrhoea, you adopt a milder kind of antiphlogistic treatment; you empty the bowels, keep the patient quiet, give him low diet, give him nitre and the supertartrate of potass, and diluent drinks.

In the state of high inflammation of the penis, patients experience relief from the application and frequent renewal of cold to the part. Sometimes they fancy they derive more benefit from the application of warmth, from fomentations, or steeping the entire penis in warm water.

An attempt has been made to cut short the disease in the urethra by means of local applications to the inflamed membrane, under the form of injection, and, in fact, this kind of application makes a considerable figure in the treatment of clap. Injections are divided into three or four classes, the emollient injection, the sedative injection, the stimulating injection, and the astringent injection. Various mucilaginous and narcotic substances have been recommended under the idea of soothing and removing the pain; that is, supposing them to act as emollients or sedatives. I believe we can do no good in this way by injection, and that so far as pain goes, we shall not benefit the patient by injecting into the urethra either an emollient or a sedative. With respect to a stimulant injection, I do not apprehend that any one could think an inflamed urethra could be benefited by such an application. So that we come at last to the class of astringents. It has been
proposed, and the suggestion has been extensively acted upon, to insert pretty strong solutions of astringent substances into the urethra in the early stage of the affection, with a view of stopping the discharge; that is, cutting short the disease in this way. A saturated solution of the nitrate of silver, ten grains to the ounce*, (which is pretty strong when used in this way,) is thrown into the urethra; it is said this will put a stop to the discharge if you apply it at a very early period. I may observe, with respect to these astringents, that you do not want to apply them to the urethra further than to the extent to which the inflammation goes; and as that, in ordinary cases, does not go beyond the distance Mr. Hunter has mentioned, of course you prevent, by pressing the penis with the finger and thumb, the introduction of the injection further than you wish it to go. I have not myself had any experience in the practice of throwing in strong injections. I can only say it has been practised in the army, and the gentlemen by whom it has been employed represent it to be safe and advantageous. More commonly we use injections, if we use them at all, for the purpose of removing the symptoms after adopting the antiphlogistic means I have described in a milder form. We employ the sulphate of zinc, sulphate of copper, the oxymuriate of mercury, or the nitrate of silver; of the three former, two or three grains to an ounce of distilled water, and of the latter not more than one grain to the ounce. These should be injected in the way I have mentioned, about three times a day. In some cases injection of this kind puts a stop to the discharge; in other instances it seems to augment it. The decreased discharges from the injection of astringents have induced a supposition that they give rise to strictures of the urethra, and hence many practitioners never employ them at all. I fancy, generally speaking, the treatment, in London, by injection, is not much adopted.

So much for what we should call the rational treatment. We come, then, to the empirical; and here do we find, that certain

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* Ten grains will not saturate 3/4 of water, for I have injected a solution containing at least eighty grains with the best effect.—Ed.
remedies exert a certain influence over the complaint, although they are not such in their nature as, à priori, we should have expected to have had such an effect. One of these is a remedy of rather a recent introduction, but which, from the experience of its utility, is very generally employed; I mean the cubeb pepper, also called Java pepper—cubebs, a pepper brought from Java. This given at the commencement of the complaint, will very frequently bring it to an end in a few days; and in other cases when it will not arrest the discharge, it will stop the pain. For this purpose you should give not less than two drachms of the pepper three times, or even four times a day. The longer the complaint has existed before you use the remedy, the less likely are you to put a stop to it by the employment of the pepper. Its benefits are found chiefly when it is employed in the early stage of the disease, and the existence of considerable inflammatory action does not offer an objection to its use. Another remedy is the balsamum copaiba, which you give in the dose of from half a drachm to a drachm three times a day, either giving it simply by dropping it on moist sugar, and letting the patient swallow it in that way, or by dropping it in water, and letting him take it as he would castor oil, or giving it in some mucilaginous or emollient substance. After the employment of antiphlogistic means in a suitable way, the administration of the copaiba has a very marked effect in bringing the complaint to an end. The copaiba is much the most commonly employed medicine in that chronic state of the affection which constitutes gleet.

I have mentioned to you, that the inflammation of the mucous membrane runs through a certain course, and comes to a natural end, without entailing any future ill consequences on the patient. There are, however, some instances in which we have reason to suppose, that secondary symptoms have followed from gonorrhoæa; but these instances are so few, that many individuals who perhaps have never seen a case of the kind, will hardly believe the possibility of its existence; but those who have had much experience in gonorrhoæa, recognise the possibility of secondary symptoms
from it. This is the case with Mr. Carmichael; he says, that gonorrhoea is sometimes followed by eruptions on the skin, pains of the joints and limbs, and ulcerations of the tonsils; but the cure of these does not require the use of mercury; the antiphlogistic treatment accomplishes all that is necessary. There are some other circumstances occasionally observed in cases of gonorrhoea; the inflammation of the mucous membrane of the urethra may cause swelling and inflammation of the glands in the groin; that is, may cause bubo. If you adopt the antiphlogistic measures which the local symptoms require, and keep the patient at rest, you will not be much troubled with buboes of this kind; at all events, the treatment is to be conducted, first, upon the ordinary principles.

The inflammation of the prepuce, if it goes to a considerable extent, will cause phymosis, contraction of the lining of the prepuce, and particularly of the orifice, so that the prepuce cannot be drawn back over the glans. You must employ, here, local means to reduce the inflammation, and you will not find that phymosis is a serious symptom in a case of clap. It is necessary, in order to lessen the inflammation, under such circumstances, not merely to adopt the local antiphlogistic means we are in the habit of using, but frequently to syringe under the prepuce, to prevent the accumulation there of gonorrhœal discharge. The retention and soaking of that discharge beneath the prepuce, irritates the delicate covering of the glans and the lining of the prepuce; it augments the inflammation of those parts, and may lead to serious ulcerations and other bad consequences; hence it is necessary to practise ablation carefully by means of a syringe.

The opposite state—paraphymosis, may arise either in gonorrhœa, or when sores exist upon the parts in consequence of syphilis; that is, supposing the orifice of the prepuce to have become contracted by inflammation, and the patient withdraws it for the purpose of using some sort of wash, wishing to expose the glans penis, and leaves it withdrawn, the pressure which the contraction exerts over the prepuce behind the glans, occasions the glans to
swell, and get into that state which prevents the prepuce being again drawn over it; that is the condition called paraphymosis. If the part remain in this state for some time, considerable swelling and inflammation of the glans will take place. The pressure from the contracted orifice of the prepuce becomes more considerable; it forms a deep fissure behind the corona glandis, as if the penis were tied by a tight string. When you see a case of this kind within three or four days of the occurrence of the paraphymosis, you will seldom fail in restoring the glans to its natural situation. In the first place, you may get a basin of cold water, and let the patient, with a sponge or piece of lint, bathe the part, so as to cool it as much as possible; then you press gently upon the swollen glans with the thumb, or with the thumb and finger of the one hand, while you gradually draw the contracted orifice of the prepuce over the glans with the other. If you proceed thus slowly, squeezing the blood out of the glans to reduce its size as much as possible, and endeavour gradually to push it into the contracted orifice of the prepuce which you are drawing forward, you will usually, if not too hasty, succeed in relieving the patient from a situation of great alarm, apprehension, and pain. When, however, the prepuce has been left in this state for a considerable time, a high degree of inflammation occurs, effusion takes place, and, in fact, the skin of the prepuce becomes fixed and agglutinated in its unnatural situation. Under such circumstances, you will find it necessary to cut through the stricture; for you will find that, although it may not produce bad effects on the glans, it will very much alter the appearance of the penis. If you make a small puncture in front of it, you will be able to introduce a small probe-pointed bistoury, and with that easily cut it through.

The irritation of gonorrhœal discharge very frequently produces warts either on the glans of the prepuce of the male, and still more frequently produces a great abundance of them on the external organs of generation of the female. Indeed, the external organs of the female are so situated and circumstanced as to lead to considerable moistening of them by gonorrhœal, or other dis-

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charges occurring in those cases of irritation. Discharges, uncleared, continue to irritate the parts, and thus you have immense growths of warts about the origin of the vagina, the nymphæ, the lower parts of the perineum, and the neighbourhood of the anus. Sometimes the orifice of the anus is quite covered with them, so that you do not feel the end of the intestine. Indeed, those situations are so thickly beset with them, that you would not recognise the parts. Masses of them, not much less than your hand, proceed from those parts, arising from inflammation of the cutaneous textures, and excited by the irritation of gonorrhœal discharge.

When warts are of moderate size, you may attack them either by escharotics or irritating substances. In the first place, you would attack them by putting a stop to the discharge which produces them, and that painful excoriation of the surface which accompanies them. When you have done that, you may rub the warts over, if they be of moderate size, with lunar caustic; or you may sprinkle them over with irritating powder. When they are large, however, they do not yield to this; you must then remove them with the scissors, and rub the parts over with the lunar caustic, soon afterwards, to prevent their recurrence. Some have recommended the application of strong acids to them; and Mr. Carmichael speaks in great praise of the acetic acid, which acts as any other acid would do, as an escharotic, in destroying the vitality of the part *.

In the course of gonorrhœa it is not uncommon to have the discharge suddenly stopped, and inflammation and swelling produced, with great pain in one of the testicles; and this particular kind of inflammation of the testicle has been called hernia humoralis. It is, in fact, an active inflammation of the gland. The part swells, becomes very painful, and if the inflammation be considerable, the scrotum which covers it assumes a bright-red colour. When the inflammation, too, is considerable, it is com-

* R. Ung. Hyd. Nit. 3j.; Pulv. Arsenical. gr. j. ft. Ung.—With this ointment every description of wart may be removed with safety.—En.
municated to the loose cellular texture of the scrotum, so that its integuments become, in some degree, fixed to the part. Severe pain is felt in the part, more particularly as long as the patient is in the upright position. The discharge from the urethra generally stops entirely.

You must treat this inflammation by the ordinary antiphlogistic means:—free bleeding of the part by leeches, fomentations, poultices, enforcement of the recumbent position, and cleansing of the bowels. Sometimes you apply leeches pretty freely and repeatedly, and yet you do not succeed in putting a stop to the inflammation; the part remains inflamed and very painful. Under such circumstances you derive great advantage from the free employment of tartar emetic to the extent of producing vomiting. You may give half an ounce of the liquor antimonii tartarisatum of the Pharmacopeia, which contains a grain of the tartar of antimony, and repeat that every four hours, so as to keep up a continual nausea. From this you will find great benefit; indeed, this treatment is very frequently resorted to for the purpose of relieving hernia humoralis; and I have seen some instances where great pain and inflammation, which had remained in spite of the application of leeches, yield by the employment of emetic tartar in the way I have just mentioned. It is necessary for the patient to remain in the recumbent position until the swelling has completely abated; at all events, if patients who have been confined for hernia humoralis get up too soon, if they attempt to go about their ordinary occupation too speedily, they very commonly bring on a relapse of all the symptoms, so that on this head great caution is necessary.

There are other and more serious circumstances arising from gonorrhœa when it takes place in particular constitutions, those, for instance, of a rheumatic disposition; such persons are liable to severe inflammation of the eyes—to severe inflammation of the mucous membrane of the eyes, and to a serious affection of the sclerotica, sometimes extending to the iris, that is, to the fibrous textures of the eye; sometimes the one and sometimes the other
occurs, the complaint in the urethra being diminished, but the discharge still going on more or less during those affections. These inflammations of the eye, I shall have occasion to speak of when I come to speak of the affections of the eye. In the same individual in whom such affection has occurred, in consequence of gonorrhoea, it will almost invariably happen, that a rheumatic affection of the joints will also take place, very commonly of the knees, feet, and ankles, and indeed other affections which certainly pretty closely resemble rheumatism, so that these have been not inaptly denominated gonorrhoeal rheumatism. When this occurs in the feet, you find a particular tumefaction of them, a kind of oedematous swelling, which, in common life, is described as rheumatic gout. These affections of the joints will extend from one joint to another. One joint may get better, and others may become affected. In fact, in the extension of the disease from one joint to another, the shifting of the disease, the affection certainly possesses nearly all the characters of rheumatism. Such affections of the joints may take place in conjunction with those of the eyes, or in alternation with, or in succession to them.

In treating them, you are to bear in mind the peculiar constitution from which this succession of symptoms derives its origin. You are not to be contented with the local means which the state of the joint requires; you must bear in mind the state of the constitution. In the first place, it may be necessary to take blood from the arm; it would be proper to evacuate the alimentary canal by purgatives with antimony; and after adopting these means, I think you will considerably abridge the duration of the disease by giving mercury; you will lessen the intensity of the symptoms, and thereby prevent those important effects, when a limb is the seat of affection, which often take place under these circumstances. There would be no objection to carry the medicine to the extent of affecting the mouth. The colchicum is usually employed in these cases. So far as local treatment goes, you will find that cupping or leeches, and fomentations, will be
advantageous; but you will also find, that these local remedies will not answer the purpose without the adoption of the more general means which I have pointed out to you. Such complaints are exceedingly tedious, as must be all complaints in joints which arise from constitutional causes. As we cannot speedily alter the state of the constitution from which the disease occurs, we cannot rapidly cure the complaint. Persons are inclined to try the removal of this chronic state of the joints by blisters. I think blistering will not do good when there is any thing like active inflammation remaining. When patients have had these complaints for a length of time, we frequently find benefit produced by removal to the sea-side, and employing a course of sea-bathing; but after all, this healthy state, when it is produced, is not so much from the means just mentioned as from the complaint ultimately wearing itself out.
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EXTRACTS FROM THE BRITISH AND FOREIGN MEDICAL REVIEW.

In the British and Foreign Medical Review, for January 1838, there appeared a very excellent analysis of the opinions entertained by recent English and Continental authors on the Natural History and Treatment of Syphilis, from which we propose to present a brief abstract.

The article commences with a sketch of the progress which has been made, during the last fifty years, by those who advocate the non-mercurial treatment of syphilis; which, being merely a series of chronological details, we will here omit, and pass on to the more interesting statistical details which have been accumulated during the last few years on the comparative merits of this mode of treatment.

In the year 1822, the Royal Council of Health in Sweden, having been charged by the king to conduct a series of experiments upon the different modes of treating venereal diseases, and compare their results in order to check the abuse of mercurials in a country where the climate rendered their use so dangerous, reports from all the military and civil hospitals were ordered to be drawn up annually. According to these reports, 40,000 cases have been treated in the various hospitals; one half by the simple method, and the remainder by mercury. Of the former, seven and a half per cent. had secondary symptoms, while of the latter, the proportion has been thirteen and a half per cent. Incontestably proving, in that country, at all events, the superiority of the non-mercurial over the mercurial plan of treatment.

In the year 1828, Dr. Fricke's experiments in the Hamburg General Hospital were first published. Out of 1649 cases, in both sexes, 582 were treated by a mild mercurial course, and 1067 without mercury. The mean duration of each case under the latter method was fifty-one days, while under the former it extended
to eighty-five days. Under the use of mercury, he found that relapses were more frequent and severe; while they rarely occurred when the opposite course was adopted; and when they did occur, they were more simple and mild in their nature. He has since then had many thousands of cases under his care, and his opinions remain unaltered.

In 1833, the French Council of Health published a series of reports collected from the various military hospitals throughout the kingdom. And the general conclusions they have come to are, that, although primary syphilis will yield to the simple treatment, relapses and secondary affections require a contra-stimulant or revulsive action, and of all the medicines that have been tried by them, although many have proved successful, yet they place the greatest reliance in the preparations. But the French reporters are by no means unanimous on this subject; for M. Devergie, who has treated more than 6000 cases in public and private practice, arrives at the same results as Dr. Fricke.

From these and similar reports of cases the reviewer concludes, "that the sum total of cases submitted to experiment in the above report amounts to about 80,000; indeed, they might be fixed at a much higher number; and it appears that the proportion of relapses or secondary affections, where the primary symptoms have been treated without mercury, is, at its lowest estimate, reduced to ten, at its highest, to twenty in the hundred. We are perfectly willing to admit that the great irregularities in syphilis, and the very different conditions under which it appears, give less force to statistical evidence applied to its elucidation, than to that of many other diseases; yet, making every allowance for data thus collected, and taking into consideration the incompetency of the individuals to observe accurately, and the party feeling of others, together with the perplexities arising from the mal-administration of mercury, &c., it cannot be denied that a sufficient mass of observations remains to establish the fact that a large majority of primary syphilitic affections get well, like ordinary ulcers, under simple treatment, or even by the unaided powers of the constitution; and that,
of those cases of secondary disease which do occur, although, perhaps, subject to more frequent relapses, the majority will ultimately wear out or be overcome by the mere action of secretory and excretory functions; thus leaving but a small remainder of inveterate instances to be combated by other means."

The Reviewers then proceed to discuss the immediate agent of syphilis: that is, whether these effects appear to be regulated by any fixed laws, in which, making due allowance for disturbing influence, are we enabled to trace a clear chain of cause and effect, and to distinguish them with certainty from other diseases? Then comes the "questio vexata,"—one party contends for a unity, or single contagious principle, ascribing the diversity of forms in which it manifests itself to idiosyncrasy, climate, habitude, age, greater or less intensity of the virus, mode of its absorption, &c. Another class of medical philosophers contend for a plurality of poisons, the precise number of which no two of them are agreed. Under these circumstances, a third party now appears, denying that we have any just grounds for deriving from a specific virus of modern origin, or including under one head, an assemblage of disorders of various kinds, to which the human race has always been subject from the first institutions of society.

The opinions of the various authors are then given, beginning with Hunter, Abernethy, Carmichael, Evans, Wallace, Desruelles, Colles, Judd, &c., &c., which will be more fully developed when we come to their mode of treatment, in which, happily for the cause of humanity, there is an approximation to uniformity of opinion, and we have good reason to believe that the debateable ground is daily becoming narrower. On each of these systems we now propose to enter, in order to ascertain, if it be possible, which of them has the best claim to the merit of removing syphilis. "Tuto, cito, et jucunde." For which we are indebted to No. XX. of the said Review for October, 1840.

It would carry us far beyond our limits to enter into the vexed question of the identity or non-identity of the venereal poison; whether all the affections succeeding to sores or discharges from
the genitals are due to the application of one virus, whether they result from the action of many, or from one in different states of modification. We apprehend, however, that the facts we shall have to bring forward will go far to prove that if the different forms of venereal diseases, both in their primary and secondary varieties, are not owing to the absorption of poisons of a totally different character, they at least depend upon a virus very differently modified; and it is with surprise that we observe a writer like the late Dr. Wallace maintaining, at the present day, the identity of gonorrhoea and chancre, and recommending what must be considered in some measure an indiscriminate mercurial treatment for both.

M. Ricord informs us that he entered on his experiments on inoculation without preconceived notions or prejudices, and that he instituted them to determine the following points: 1. The existence of a special cause for the production of syphilitic diseases—the venereal virus. 2. To distinguish, one from the other, diseases apparently similar. 3. To establish the differences which exist between primary or local and secondary or constitutional syphilis. 4. To endeavour to frame a rational preventive and a curative treatment,—a preventive treatment for secondary symptoms, a curative for primary ones. 5. To settle some points in relation to hygiène and forensic medicine.

M. Ricord's experiments were performed by taking some of the secretion from the surface of a venereal sore, or the matter of gonorrhœa, upon the point of a lancet, and introducing it by puncture in the skin of the thigh of the patient himself.

In reference to the first question proposed, M. Ricord's experiments establish that chancre, whatever may be its seat, is the consequence of the application of a specific pus which a chancre alone secretes, which matter produces a similar chancre whenever placed in circumstances favourable to contagion. To repeat this experiment with success, it must be recollected that chancrees are divisible into two distinct stages recognised by Ricord, Wallace, Carmichael, Evans, and others, viz., the stage of ulceration and that of
reparation or granulation. It is during the first stage only that the chancre secretes a specific pus, capable of propagating the disease, and producing a similar sore by inoculation: when the sore begins to heal, when granulations spring up, covered by simple puriform matter, the disease is not capable of propagation. In this case inoculation is negative and produces no result, from the circumstance that the sore no longer furnishes a specific matter, but simple pus not varying in its character from that of the secretion of an ordinary sore whose origin is due to other causes.

Mr. Evans states, that from his experiments he is led to conclude that the fluid secreted by a chancre varies in its effects. He proves that the earlier the infection is taken, whilst the sore is in its excavated or ulcerating state, and, as we may infer, before the matter is truly purulent, the more severe and obstinate is the ulcer which it produces. The experiments of M. Ricord have been repeated by Dr. Mairion at the military hospital of Louvain, on 228 cases of various forms of syphilis: out of these 228 cases eighty-five were chancre or primary venereal sores, and of these eighty-five, fifty-three furnished the characteristic pustule by inoculation. M. Ricord describes the pustule succeeding to inoculation with the matter from a true chancre as follows (we avail ourselves of Mr. Parker's translation):

"If matter be taken from a chancre during the period of ulceration, and introduced under the epidermis by means of a lancet, it produces the following effects:—During the first four-and-twenty hours the puncture becomes more or less inflamed; from the second to the third day it is accompanied with a slight tumefaction, and presents the appearance of a small papula surrounded with a red areola: from the third to the fourth day the disease assumes a vesicular form, the epidermis being raised by a fluid more or less opaque, presenting at its apex a small dark point; from the fourth to the fifth day the contents of the vesicle become purulent, the apex of the pustule is depressed, resembling very much the pustule of small-pox. At this period the areola, which had progressively increased, begins to diminish or altogether disappears, particularly
if the disease does not increase; after the fifth day, however, the subjacent and surrounding tissues, which hitherto had undergone little or no modification, or were merely slightly oedematous, become indurated by the extravasation of a plastic lymph, which communicates to the touch the resistance and elasticity of cartilage. After the sixth day the contents of the pustule thicken, the pustule itself shrivels up and is covered with crusts. These enlarge towards their base, and forming by successive strata, at length assume the form of a truncated cone with a depressed apex. If these crusts are detached, or if they fall off, we find under them an ulcer with a hard base, extending through the whole thickness of the skin. The surface of this ulcer, of a deep red colour, is foul, covered with a thick adhesive pultaceous matter, almost like a false membrane, which cannot be removed by any attempt to clean the sore. The edges of the ulceration at this period appear as though it had been dug out from the surrounding parts by a sharp circular instrument. The immediate vicinity of the sore is surrounded by a dark red or livid margin, more elevated than the surrounding parts."

M. Ricord gives 389 cases of chancres which, when tested during the period of ulceration, produced this characteristic pustule by inoculation. In the cases detailed by M. Mairion, thirty-two ulcerations upon the genitals out of eighty-five did not yield the characteristic pustule, the punctures being followed merely by a slight degree of inflammation, which generally disappeared in the course of twenty-four hours. These, then, were cases of simple ulcers and not true chancres. It is evident that the experiments of Ricord prove, beyond the possibility of doubt, the existence of a true "venereal virus," a specific morbid poison. Dr. Wallace, without being aware of Ricord's experiments, states as a characteristic of the legitimate form or primitive type of true syphilis, "that it is more easily propagated by inoculation than any of the other forms of the venereal disease." This is owing to its independence of contingent or accidental circumstances; and hence it is probably the form of primary syphilis which would invariably occur if the action
of the poison was uninfluenced by any such circumstances; whereas we often fail in producing the other forms of venereal diseases because they are partly the result of accidental causes which may not be present at the time of inoculation. In Dr. Wallace's clinical lectures, published in the Lancet, many experiments are detailed which entirely corroborate the statements of Ricord. He says, "the local specific effects which result from inoculation with the matter of the primary pustule commence almost immediately. In all the experiments which I have detailed, specific inflammation was produced within the second day, and in three or four days the characteristic pustule was fully developed." Both Carmichael and Mayo corroborate the accuracy and value of Ricord's experiments.

The mixture of the true venereal virus, secreted from a chancre in the state of ulceration, with the ordinary mucus of the vagina, the urethra, or the surface of the prepuce, or with the secretions of these parts in a state of inflammation, does not destroy its specific character, or prevent it producing the characteristic pustule by inoculation, unless it be too much diluted. Various chemical agents, however, destroy its powers, and it no longer produces any result when tested by inoculation. Chemical substances decompose it. Amongst these Ricord mentions alkalies, and moderately concentrated acids, as the nitric, hydrochloric, sulphuric, and acetic; potass, soda, ammonia, wine, alcohol, and a strong decoction of tan: the active principle of the latter with wine forms, as we shall presently see, one of his favourite applications to primary syphilitic sores.

The next question to be resolved is the identity or non-identity of the morbid poisons producing a true chancre and gonorrhoea. We believe the diseases to be totally distinct, as the experiments of Ricord and many others seem to us incontestably to prove. Not only are they proved to be distinct by the results drawn from inoculation, but by their pathology and the effects of remedies. It is well known that Hunter considered them identical. Dr. Wallace maintains nearly the same views, considering gonorrhoea
as a form of primary syphilis, which he describes under the term "catarrhal primary syphilis;" and we find some writers, even at the present day, still maintaining that gonorrhoea gives rise to chancre followed by secondary symptoms: these discrepancies, however, we hope to succeed in some measure in reconciling. Gonorrhoeal matter, says Ricord, applied to a healthy mucous surface produces a gonorrhoea, the more easily as the matter itself is more purulent and less mucous or sanious.

"In no instance is it capable of producing a true chancre, but as a simple irritant, like the fluid of coryza, for example, it may excoriate the skin with which it remains some time in contact, but cannot produce a specific ulcer. Convinced of these truths, so frequently verified, my pupil, M. Leon Ratier, has frequently inoculated the skin of his arm with gonorrhoeal matter without the slightest result. The diseases consecutive to gonorrhoea do not furnish a specific pus, or one producing a specific ulcer from inoculation. Constitutional syphilis does not succeed to gonorrhoea. Where these symptoms are said to have succeeded a gonorrhoea, in the observations recorded by authors, the cases are in a direct ratio of frequency with those of chancre of the urethra. These cases have been incorrectly diagnosticated, the diseased surfaces not having been explored."

In Mr. Acton's valuable papers in the Lancet, referred to at the head of this article, several interesting facts bearing on these points are recorded; and many others have been made public by other followers of M. Ricord.

Dr. Mairion tested eighty-five cases of gonorrhoea; of these, four yielded a specific pustule from inoculation—there were chancre of the urethra. The remaining eighty cases of simple gonorrhoea produced no result, however frequently the diseases were tested, which they were in all periods of their course. In one case the results were not noted. Mr. Carmichael, in his lectures on venereal diseases, recently published in the Dublin Medical Press, has misunderstood and consequently misstated some of Ricord's experiments. Mr. Carmichael there adduces
some cases of discharges from the urethra which being tested by inoculation yielded the characteristic pustule of chancre. Mr. Carmichael gives this as a case of gonorrhoea; but Ricord distinctly calls it a case of concealed chancre, chancre of the urethra (chanres larvés). "In pressing the fossa navicularis," says M. Ricord, "we felt the induration indicating the seat of the chancre." This is the case of B—r quoted by Mr. Carmichael from p. 235 of Ricord's book as a case of gonorrhoea. The arguments generally adduced for the identity of the two poisons in chancre and gonorrhoea are, the occurrence of secondary syphilis after diseases characterized by discharges from the urethra only, and the fact that a female with an ulcer only shall produce gonorrhoea in one instance and a true venereal pustule in a second.

The true conditions of these cases are well stated by Mr. Babington:—"With regard to the first of these," he says, "the instances are so rare, that they must rather be considered as anomalies which we cannot yet account for, than be admitted in contradiction to the general current of experience. The secondary symptoms in such instances are rarely of an indubitable character. It may be doubted whether distinct copper tubercles ever followed simple gonorrhoea. We have generally a mottled state of the skin, or the lighter and more fugitive forms of lichen, or slight excoriati on of the surface of the tonsil. ... It has been asserted, that women who are affected with gonorrhoea alone will frequently produce chancre in those men who are connected with them. Without venturing to give a positive denial to this statement, it may be suggested that its truth has seldom, if ever, been satisfactorily ascertained. The examination of the surgeon has evidently been confined to the external parts. The interior of the vagina has not been examined; yet it is certain that chancre do occur here, though more rarely, so as to be discovered only by the use of the speculum."

Much confusion exists in Mr. Judd's account of the pathology of gonorrhoea, and he has evidently included diseases of a totally different character under the term "urethritis venerea." "Gene-
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Judd's definition.

rally," says Mr. Judd, "gonorrhoea produces a discharge of pus only; but at other times it also produces a pustule or abscess within the urethra, similar to what it does more usually on the surface, and just like the discharge from a pustule on the glans penis." These latter are clearly examples of chancrese seated within the urethra, whose existence has lately been so well pointed out by Ricord and Cullerier. Chancres seated within the urethra are not accompanied by the usual symptoms which characterize gonorrhoea. We have now under our care a gentleman who has a chancre extending for an inch or an inch and a half along the urethra; this gentleman has recovered rapidly under the influence of a mercurial course, to which he submitted himself without consulting a surgeon: the chancre of the urethra was accompanied by one on the prepuce, for which he adopted this plan of treatment, having before had chancres cured in this way. The chancre in the urethra, which at first attracted little attention on account of insensibility, healed with that on the prepuce. The discharge from the urethra was comparatively trifling, much less than in ordinary gonorrhoea, and the pain in micturition much less. Mr. Mayo mentions a case similar to this, in which the patient had a chancre and a discharge from the urethra: he tested the matter from both by inoculation; to his great surprise, the characteristic pustule of chancre succeeded in both instances; by distending the lips of the urethra, a chancre was discovered, and the result at once explained.

"I entertain little doubt that the various cases reported by so many, of the same woman infecting indifferently either with chancre or gonorrhoea, admit of the same explanation. The person who has communicated the two diseases has had them both. M. Ricord has established the fact that chancres often exist deep in the vagina, and even upon the os uteri. . . . . I believe, from observation, that such chancres, not external in women, may remain for months in an indolent and unprogressive state. I attended a gentleman for three successive chancres, which he had caught at intervals of a very few months from the same woman,
who would have it she was in perfect health. At last she consented to allow me to examine her, when I found two small ulcers within the external labia, which got well under mercury.

The researches of M. Ricord on the nature and differential diagnosis of buboes are of equal interest. According to this author, buboes are of two kinds, simply inflammatory, or virulent: in the first instance, succeeding to gonorrhea, balanitis, or any other primitive affection; and in the second, arising from the consequences of the direct absorption of specific matter from a chancre.

"The virulent bubo, or that resulting from the absorption of the specific pus from a chancre, is a disease precisely similar to chancre in its nature, differing from it only in its seat. The virulent bubo is the only form capable of propagation by inoculation. The symptoms hitherto indicated by authors, with a view of establishing a differential diagnosis between the virulent bubo and one merely inflammatory, are of little value, inoculation being the only certain and pathognomonic sign."

There is a species of bubo which is termed by the French writers "bubon d'emblée," that is, an enlargement and suppuration of one or more of the inguinal glands which has not been preceded by any other of the more common forms of venereal diseases, nor in fact by any other symptom. The existence of these buboes is also admitted by Fallopius, Astruc, Swediaur, Bertrandi, and lately by Dr. Mondret, Mr. Judd, and Mr. Parker. M. Ricord insists that when these buboes occur, without the intervention of any antecedent form of disease, it is impossible to judge of their true character without the test of inoculation, and, consequently, impossible to heal them rationally or well. M. Ricord maintains that those only which furnish the true characteristic pustule of chancre by inoculation are those only which are capable of being followed by secondary symptoms. Mr. Judd mentions a considerable number of cases of this kind, where buboes succeeded to connexions with prostitutes without any other
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symptom of syphilis having preceded them. None of the parties mentioned by him had any other affection to which the buboes could be traced; and in one case the affection was clearly venereal, for it was followed by nocturnal pains, and a true syphilitic eruption of mottled skin, or exanthema roseolum. In testing open buboes, M. Ricord impresses upon us the necessity of taking the matter for experiment from the secreting surface of the sore itself, and not from the pus which may run out from the bubo, since he constantly found that the latter, which was doubtless ordinary pus, produced no effect, whilst the former—that from the surface or bottom of the sore itself—was followed, where the bubo was venereal, by the usual characteristic pustule of chancre.

Hunter denied the power of secondary syphilis to be propagated by inoculation, and the modern researches of Ricord have corroborated all that Hunter taught and wrote on this point. The virus absorbed from a chancre may produce the characteristic pustule, and thus propagate the disease by inoculation, if the matter be taken from the surface of the chancre itself during its period of ulceration, or from the lymphatic vessel or vessels leading from the chancre to the first lymphatic gland, or from the gland itself, should this inflame and suppurate; but beyond this point, where the virus becomes mixed with the blood, most probably through the medium of venous absorption, the disease is not capable of being propagated by inoculation, nor do secondary affections, properly so called, such as ulcers of the throat or skin, or ulcerating tubercles, or any of the forms of secondary or constitutional syphilis, produce venereal sores when tested by inoculation.

M. Ricord concludes from his experiments, which perfectly establish those of Hunter, "that when we find the forms of secondary syphilis not transmitted by inoculation, it is not because the disease is no longer syphilitic, but that the virus, modified by its mixture with the blood, loses the power of being propagated by inoculation, and at the same time acquires another, that of being transmitted by
hereditary taint. That whenever a syphilitic sore, whatever may be its seat and form, produces a chancre by inoculation, it is of necessity a primary affection, and not a secondary or constitutional one."

We are informed by Sir George Ballingall, that "in the Lock Hospital at Edinburgh, the experiments of Ricord upon inoculation from primary sores have been lately repeated, and with pretty nearly the same results. One of the principal points ascertained by them is that chancres of a true syphilitic character, according to Ricord's test, may heal under the simplest treatment in the course of a few days, and consequently that the shortness of time an ulcer upon the genitals remains open does not furnish, as has been sometimes supposed, a proper criterion of the non-syphilitic nature of that ulcer."

There are certain circumstances, however, in which secondary symptoms are propagated by inoculation, as from the mouth of an infant having sores from constitutional syphilis, transmitted by hereditary taint to the nipple of its nurse. In these instances the nipple of the nurse becomes ulcerated, and the ulcer "will not resemble the fissures which are so common on the nipple of women who give suck, and which occasions no loss of substance, but will be a corroding ulcer, and will destroy the whole or greater part of the nipple before it is healed." From these ulcers on the nipples the glands in the axillae frequently enlarge, and, sooner or later, if remedies be not used, sore throat, eruptions, or nodes arise, which are not distinguishable from the ordinary forms of constitutional syphilis.

These facts are the chief exceptions to the principles laid down by Hunter and Ricord of the non-transmission of secondary syphilis by inoculation, and "it is difficult in the face of them to deny that they are the effect of the venereal virus."

Some experiments detailed by Dr. Wallace in the lectures before quoted, seem in some measure to invalidate the statement that secondary symptoms are not capable of being propagated by inoculation. He shows that inoculation with the matter from a
On the Venereal Disease.

Modern treatment of syphilis.

Primary syphilis.

Constitutional pustule very often fails to produce a specific effect. So far Dr. Wallace agrees with the opinions of Hunter and Ricord; but he adds that it does occasionally succeed, not in producing a sore having the character of a true chancre, but one resembling the ulcers which accompany the constitutional forms of syphilis. Dr. Wallace observes, that inoculations with this matter succeed much more frequently if applied to a surface than if introduced by puncture. Dr. Wallace's experiments and remarks certainly prove that the laws which regulate the propagation of the two forms of disease are very different. Dr. Wallace compares them to the modes in which scabies and vaccination are propagated, one by contact, the other by puncture.

We now proceed with our enquiry into the modern treatment of syphilis. We need not here enquire into the comparative merits of the two opposite modes of treating the affection practised at the present day, or detail the statistical results of such treatment. The treatment of syphilis without mercury is termed "the simple or physiological method;" the treatment with mercury "the revulsive or mercurial." We purpose, in the remainder of this article, to confine ourselves to the question of the actual mode in which the modified mercurial treatment is carried on by modern surgeons, referring our readers to our former article for details of the simple treatment.

I. Primary Syphilis.—We shall commence with the catarrhal affections. There is a true and false gonorrhoea, properly so called; and also gonorrhœal diseases of the eye. This class of affections constitutes the non-virulent venereal diseases of Ricord, the catarrhal primary syphilis of Dr. Wallace, and the erythematous primary diseases of M. Desruelles. The first affection of this class is that described by M. Desruelles under the term "balanitis," the external, bastard, or false gonorrhœa of Ricord. This affection consists in inflammation, with a muco-purulent discharge, from the mucous membrane covering the glans penis. When the disease extends to the under surface of the prepuce, it is called balano-posthitis, and this is its most general form.
"The symptoms which ordinarily denote the existence of balanitis, are heat and itching of the glans penis and prepuce, with a discharge of variable character from the orifice of the latter; these symptoms may be accompanied by phymosis or paraphymosis. When the prepuce can be drawn back, and the glans uncovered, this is found red, swollen, and covered with a mucopurulent fluid of an unpleasant smell. The epithelium of the glans and prepuce is detached in places, excoriated, but not in a state of true ulceration. The testes and glands of the groin are more or less swollen and tender; we have seen the latter occasionally suppurate, and bubo supervene upon balanitis."

Balanitis may be the consequence of connexion with women suffering from gonorrhœa, but more commonly succeeds to intercourse with females menstruating, labouring under leucorrhœa, simple inflammatory affections of the vagina, or when this part is covered with secretions of a more or less irritating character. Mr. Judd gives several cases where a species of bastard gonorrhœa, soon subsiding, succeeded intercourse with females during menstruation. In some instances, balanitis occurs to married men, who have had no intercourse, except with their wives, and where there has not been the least reason to suspect the character of the female. Mr. Parker relates a very remarkable case of this kind:—

"A lady of most irreproachable and exemplary character, the mother of nine children, in the seventh month of her pregnancy of her tenth child, became affected with itchings and swelling of the labia, and a mucopurulent discharge from the vagina; her husband consulted me a few weeks afterwards, having certainly had no other connexion, with severe inflammation and excoriation of the surface of the glans and prepuce, from which oozed a mucopurulent fluid. Some slight astringent washes soon removed the disease, which was thought of no more. The lady, however, became again pregnant, and about the same period of her pregnancy, her leucorrhœa again returned more severely than before.

* Epithelium—the red cuticle on the glans, or lips.—Ed.
Her husband again consulted me; the internal surface of the prepuce and glans were swollen, intensely red, and painful, and covered with small aphthæ; in some places the mucous membrane was denuded, exposing a deeply red surface secreting a thick pus.”

It is of great importance, where the character of a female is at stake, to determine whether the affection she is labouring under is merely a chronic or subacute vaginitis, or a true gonorrhœa. This point engaged the attention of Mr. Hunter. “Gonorrhœa,” says he, “is not so easily known in them as in men, because the parts commonly affected in women are very subject to a disease resembling the gonorrhœa, called flor albus; and the distinguishing marks, if there be any, have not yet been completely ascertained. The kind of matter gives us no assistance in distinguishing the two diseases, for it often happens that the discharge in the flor albus puts on all the appearance of the venereal matter; and an increase of discharge is no better mark by which we can distinguish the one from the other. Pain, or any peculiarity in the sensation of the parts, is not a necessary attendant upon this complaint in women, therefore not to be looked for as a distinguishing symptom.” Modern authorities do not seem to have advanced much, since the time of Hunter, in determining the differential diagnosis of the two diseases. “The diagnosis of leucorrhœa,” says Dr. Churchill, in his Outlines of the Principal Diseases of Females, “is, according to all authorities, extremely difficult.” Sir C. M. Clarke seems to think it impossible. Ricord thinks all doubt may be removed by an examination with the speculum. Whenever the peculiar erosions or superficial ulcers of the mucous membrane covering the cervix uteri are discovered, and which occur in nineteen out of twenty acute cases, we can have no hesitation in pronouncing the disease to be true gonorrhœa.

Uncomplicated balanitis generally gives way quickly to remedies of an appropriate kind. If the prepuce can be denuded, Ricord recommends the surface of the glans and prepuce to be superficially cauterized, by drawing the solid nitrate of silver quickly over the whole diseased surface. Slightly astrin-
gent injections between the glans and prepuce are of great service, as recommended by Desruelles and Cullerier. Mr. Parker recommends the following liniment to be introduced between the glans and prepuce by means of a camel-hair pencil: R. Cerati simp. v. Mellis, Olei Olivae, ââ ʒi. Hydrarg. Chlorid., ʒs. P. Opii, ʒj. M. All the modern writers under review agree in the propriety of an antiphlogistic treatment in the early stages of acute or virulent gonorrhœa.

"In the early stage of the more phlegmonoid varieties, and these occur in more healthy habits, great advantage will be obtained in the first instance by such remedies as subdue vascular action, such as blood-letting, particularly local blood-letting, by the application of leeches to the region of the frænum, or by the division of one or more of the veins in the body of the penis; also by the gentle but full evacuation of the bowels, by antimonials, by perfect quietness, particularly in the recumbent posture, by abstinence, by fomenting the perinæum with tepid water, by a very soft poultice to the end of the penis or orifice of the urethra, when the prepuce is not sufficiently long to cover the latter, by suspension of the testicles, by diluting, alkaline, and mucilaginous drinks, and by the use of the hip or general tepid bath."

When the acute inflammatory symptoms have been subdued, Dr. Wallace submitted his patients to the use of what may be termed the specific remedies in gonorrhœa; such are cubebs and the copaiba balsam, with injections of the nitrate of silver and mercury. Mr. Judd, Ricord, Cullerier, and Mr. Parker have employed the nitrate of silver injections with great benefit in gonorrhœa; there appears, however, amongst these writers, great difference of opinion as to the degree of strength in which the solution of this salt should be employed. Dr. Wallace and Mr. Judd have used it in the proportions of fifteen grains, or even more, to the ounce of distilled water; Ricord and Mr. Parker recommend two grains to the half-pint. Sometimes the solution of nitrate of silver cannot be borne, or does not check the
discharge. In these cases the authors before us have proposed a vast variety of remedies. A favourite injection with M. Ricord is a solution of the ioduret of iron in the proportions of three grains to six ounces of distilled water. In weak solutions the ioduret of iron has frequently arrested the discharge in five or six days; again, it has produced an acute attack of urethritis; but when this has subsided, the patient has found himself cured of his gonorrhœa. Sir George Ballingall has made some observations on the use of the nitrate of silver injections, of the strength recommended by Dr. Wallace and Mr. Judd, and the results would lead us to make use of it with a less proportion of the salt. Sir G. Ballingall employed it in two cases, and both recovered quickly, but at the expense of much suffering. In twenty cases, in which it was used in the 88th regiment, in the strength of a scruple to the ounce, the cases were cured at various periods, from ten to forty-two days, the average length of time having been seventeen days. In seventeen cases treated in the same regiment by rest and abstinence, the average duration of the treatment was only eight days. Rest and abstinence, however, are not always to be enforced in private practice; and Sir G. Ballingall thinks that, unless injections be employed immediately on the subsidence of the inflammatory symptoms, the disease may be protracted for months. Where the solution of the ioduret of iron has been borne, the average duration of the treatment has been seven or eight days. Mr. Judd has given, from his own practice, a table of the comparative powers of different injections in curing a gonorrhœa quickly.

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<tr>
<th>Composition of the Injection</th>
<th>No. of Days in curing</th>
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<tr>
<td>Sol. Liq. Plumbi, c.</td>
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<td>Ext. Belladonnae.</td>
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<td>Tinct. Ferri Mur. c. aquà.</td>
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Composition of the Injection.  No. of Days in curing.
Tinct. Ferri Mur. c. aquæ.  Seven.
Sol. Argenti Nitratis.  Seven.
Ditto, et Copaibæ.  Three.
Ext. Cubebæ.  One.

All these persons, says Mr. Judd, were cured in unusually short periods, of from one to seven days, and the last two only appeared to suffer from the sudden suppression.

The formulae for a great variety of injections are given by Mr. Parker. Amongst these, a favourite one of M. Ricord may be mentioned, consisting of a solution of pure tannin in port-wine, in the proportions of eighteen grains of the former to six ounces of the latter. This is occasionally very useful. We have known a few grains of tannin, placed upon the tongue, quickly cure a salivation which no other remedy would check.

Dr. Wallace employed mercury, given internally, in gonorrhœa, or what he terms catarrhal primary syphilis. The grounds upon which this is recommended, are certainly not sufficient to warrant the general exhibition of this remedy in the ordinary forms of gonorrhœa, and we had thought the experience of modern surgeons had set this matter at rest. No British surgeon can forget the manly manner in which Sir A. Cooper exposed the abominable system of submitting the patients in Guy's Hospital to courses of mercury for the cure of gonorrhœa. "To compel an unfortunate patient to undergo a course of mercury, for a disease which does not require it, is a proceeding which reflects disgrace and dishonour on the character of a medical institution." Yet we find Dr. Wallace, on the theoretical assumption of the identity of the poisons in gonorrhœa and syphilis, recommending five grains of blue pill, with a quarter of opium, twice a day for two or three
weeks. "This," says Dr. Wallace, "has appeared to me sufficient to afford all the assistance required in general, for the removal of the disease, or to protect the constitution from contamination." What has been already stated respecting masked or urethral chancre, will explain the favourable results obtained by Mr. Wallace in some cases, and account for such a practice having been adopted by so experienced a surgeon.

Although gonorrhoea is not followed (except in very rare instances, and even these are matters of doubt) by secondary symptoms, properly so called, it appears to dispose the economy, either from sympathy, metastasis, or the actual contact of gonorrhoeal matter to other mucous surfaces, to several diseases of a destructive character, which are of more importance than the affection to which their origin is due. Amongst these we shall here briefly notice diseases of the testicles and of the eye, as the works before us furnish some new and important facts on both these heads.

The most frequent of all the diseases of the testicle which succeed to or complicate a gonorrhoea, is inflammation of the epididymis, and so frequent and regularly does this occur, in many cases of gonorrhoea, that Ricord terms it "blennorrhagic epididymitis." This disease is seated in the convolutions of the epididymis, and not in the substance of the testicle itself. It has generally been supposed that this affection succeeds to the sudden suppression, or quick cure of a gonorrhoea; but M. Ricord thinks, and we believe with justice, that the chances of a swelled testicle are increased in direct ratio to the continuance of the disease. "The disease in question," he says, "does not happen once in 300 times, in the first week of a gonorrhoea, commonly it occurs after the second week, but it is most frequent during the third, or even at a later period; and this takes place both in chronic and acute cases." The occurrence of this disease is favoured during the continuance of a gonorrhoea by exercise, constipation, the abuse of stimulating drinks, and the neglect of the suspender. M. Ricord describes two forms of this disease:
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one in which the epididymis becomes inflamed from sympathy, without the inflammation having passed along the vas deferens; and a second in which the inflammation has advanced along the ejaculating duct to the vesicula seminalis, and thence along the vas deferens to the epididymis. If this species of inflammation occur with any degree of intensity, it soon involves the testicle and its envelopes, and hence, succeeding or complicating it, we commonly find inflammatory hydrocele, oedema, or phlegmon of the scrotum, with inflammation of the substance of the gland itself. Dr. Wallace remarks, that this variety of diseased testicle "is distinguished by its occurring at the seeming decline of the original affection, and by the vas deferens being diseased before the epididymis, and the latter before the body of the testicle, and it will be found that in proportion as the original disease retreats, as it were, from the anterior extremity of the urethra, the more deeply-seated portions of this canal become affected with tumidity and tenderness." These remarks favour also the opinion of Ricord, that the probabilities of the disease extending to the testicle are in direct ratio with the time of its continuance, and hence the early use of specific remedies are our best guarantees against consecutive diseases of the testicle.

The treatment generally adopted in affections of this kind consists of general and local bleeding, fomentations, poultices, with evaporating and slightly astringent lotions. Under this plan patients are generally a long time in recovering, and its use confines them to bed and the recumbent posture. In reference to bleeding, both general and local, we perfectly agree with Dr. Wallace:

"In some cases, general bleeding will be useful, but in the majority it will not be necessary. The inflammation is, for the most part, of an irritable character, and irritable inflammations are seldom benefited by venesection. The topical abstraction of blood, by unloading the weak and distended capillaries, without debilitating the system, may be more useful, but the circulation in these vessels is in general relieved by position; and the patient
should preserve a recumbent posture, with the testicles carefully suspended."

Suspension of the testicles, with gentle pressure, is of great service in affections of this character, and has given rise to the treatment now uniformly practised by Fricke, in Hamburg, and by Velpeau and Ricord in Paris. Compression in inflammation of the epididymis and the envelopes of the testicle, generally effects a cure in four, five, or six days. It prevents the occurrence of hydrocele, and one inestimable advantage is, that during its employ the patients can, except in very acute cases, follow their occupations. For a full account of this practice, as first introduced by Fricke, we refer the reader to the second volume of this Review. Since that paper was published, we have adopted the practice in many cases, and can speak most unequivocally in its praise; and it may be employed even in very acute cases. We have seen several instances where the patients have not lain in bed an hour, whilst under the ordinary antiphlogistic treatment they would have been confined from ten days to a fortnight.

Whilst in ordinary cases secondary symptoms, properly so called, do not follow a common gonorrhoea, the continuance of this disease for any length of time, particularly in irritable subjects, appears to dispose the economy to the attack of several diseases which are of a more formidable character in their results than the constitutional symptoms which succeed to primary syphilitic sores. Of this character are several diseases of the eyes, and affections of the fibrous and synovial systems. The first, and perhaps the most formidable affection of the eye we have to notice, is that which is commonly termed gonorrhœal conjunctivitis. This disease frequently affects children, and is then termed ophthalmia neonatorum, or the purulent ophthalmia of infants. "There is reason to suppose," says Dr. Mackenzie, "that this disease is not unfrequently an inoculation of the conjunctiva by leucorrhœal fluid during parturition; and that therefore it may often be prevented by washing the eyes of the infant with tepid water, as soon as it is removed from the mother." The worst
form of this disease is, however, the result of the direct application of gonorrhœal matter to the surface of the conjunctiva. One of the most frequent results of this most formidable disease is purulent infiltration of the cornea, "by which its texture is speedily destroyed, first of all exteriorly to the pus effused between its lamellæ, and then through its whole thickness, and this in a small spot only, or over its whole extent; so that sometimes we find only a small penetrating ulcer, with the iris passing through it; in other cases the whole cornea is gone, the iris exposed, and the humours protruding through the pupil." In many instances also the lens comes away.

In recent cases, the eyes are to be washed out every eight hours, with a collyrium composed of one grain of the bichloride of mercury, and eight of the muriate of ammonia, in eight ounces of water; and immediately after this has been done, either with a soft sponge, or by means of a syringe, a solution of the nitrate of silver, in the proportion of ten grains to the ounce, is to be applied over the whole surface of the inflamed conjunctiva. Under this plan of treatment, the infant generally opens the eyes in two or three days, and in ten or twelve the acute symptoms are overcome. We have frequently seen acute recent cases of purulent ophthalmia cured in three or four days, by introducing daily between the lids a portion of ointment, composed of ten grains of nitrate of silver, twenty minims of the liquor plumbi diacetatis, and one drachm of adeps, or unguentum cetacei. With these remedies local depletion and blisters may in certain cases be used. "In cases which have been neglected for perhaps eight or ten days, it is necessary to take away blood from the external surface of the upper eyelid, by the application of a leech, or from the conjunctiva by scarification. The former may be tried in the first instance, and unless followed by marked abatement of the redness and swelling on the inside of the lids, the conjunctiva may next be divided with a lancet. The taking away of blood in either of these ways, is productive of much benefit, and ought by no means to be omitted, if there be any tendency to chemosis or any threaten-
ing of haziness of the cornea.” Blisters are very serviceable, particularly in sub-acute or chronic cases; the bowels should be opened, in the acute forms, by calomel and castor oil. In threatened disorganization of the cornea, recourse must be had to the extract of cinchona or the sulphate of quinina. In the relaxed states of the conjunctiva, which succeed to the disease, the topical application of the vinum opii is useful.

The pure gonorrhœal ophthalmia makes its appearance under three forms:—1st. It may arise from the direct application of gonorrhœal matter to the eye: 2dly, It has been supposed to be metastatic; and 3dly, It has been considered, at least in certain cases, as an effect owing to irritation, merely without either the direct application of the matter or metastasis. Some writers have denied that the application of gonorrhœal matter to the eye of the same individual, has power to produce the first form of the disease of which we are speaking, and this was the opinion of Dr. Vetch. Numerous cases, however, establishing the fact that the application of gonorrhœal matter produces the most destructive forms of inflammation of the eye have been detailed by Lawrence, Mackenzie, Wallace, Astruc, Foot, Wardrop, Delpech, and Bacot. In the second form of the disease, the eye is said to suffer from metastasis; “it is stated that the gonorrhœal discharge is suppressed, and that the inflammation of the eyes occurs in consequence of that suppression.” This view is supported by Richter, Scarpa, and Beer, and they consider the restoration of the discharge from the urethra as a principal indication in the treatment of the disease. Saint Yves speaks also of this disease, but neither Dr. Mackenzie nor Mr. Lawrence have met with cases of gonorrhœal ophthalmia from metastasis, neither does Dr. Wallace allude to it. The third form of disease, where gonorrhœal inflammation of the eye occurs during the continuance of a clap, without the direct application of the matter, or without its suppression, is admitted both by Dr. Wallace and Mr. Lawrence. “Since then gonorrhœal ophthalmia may occur whilst the discharge from the urethra continues, and since it does not take place when that discharge is stopped, we
cannot admit that the affection of the eye owes it origin to the cessation of disease in the urethra. I am inclined to refer its occurrence to the state of the constitution, without being able to point out in what that state consists; and to regard it as a pathological phenomenon analogous to those successive attacks of different parts which are observed in gout and rheumatism." Dr. Wallace is pretty nearly of the same opinion: "that this form of ophthalmia is not caused, like the preceding, by the direct contact of matter from without, is demonstrated by the fact that it has been observed to occur more than once in the same individual, although every means had been most carefully employed to protect the eyes from contamination. Indeed I know several persons of the most cautious and cleanly habits who uniformly get this ophthalmia when they get a clap." Lawrence, Wardrop, and Bacot place their chief confidence in the treatment of the acute forms of this disease in "the boldest antiphlogistic treatment." Mr. Lawrence thinks "as much blood should be taken from the arm as will flow from the vein, and that the evacuation should be repeated as soon as the state of the circulation will allow us to get more." Blood must also be taken from the temples by cupping and by the free application of leeches round the part, until the pain and vascular congestion is relieved. Mr. Wardrop goes so far as to say, that the only case of gonorrhoeal ophthalmia he had seen, in which the eye was saved, was that of a young woman in whom venesection was repeated as often as blood could be got from the arm. Bleeding alone, however, must not be depended on, but at the very commencement of the disease local applications of an astringent character, hereafter to be mentioned, must be combined with it. Notwithstanding these authorities, we are disposed to think that bleeding has been too exclusively relied upon in this disease, which is in its commencement purely local; and Mr. Lawrence himself is dissatisfied with the results of the cases treated exclusively on this plan, although he attributes its want of success to its not having been employed to a sufficient extent. However, he mentions a case in which blood was taken very largely, both locally and gene-
rally, and other powerful antiphlogistic means were resorted to, yet the eye was lost. Mackenzie says "bleeding alone must not be depended on," and O'Halloran is of opinion that "if any enquiry were instituted amongst army surgeons, it would be found that those who had used the greatest depletion were the least successful practitioners." Ricord says we must on the onset bleed our patient largely from the arm, and apply leeches freely to the number of forty or fifty to the internal canthus, in the course of the angular vein; to the temple and along the course of the jugular of the same side. Desruelles and Cullerier follow nearly the same practice. Whatever plan is adopted, it should be pursued with the greatest energy, as it is well known that vision may be irretrievably lost in forty-eight hours. "Not a moment should be lost in endeavouring to control the disease, and our treatment of catarrhal syphilis of the eye must be more energetic than in any other form of the disease."

Directly after the system has been depressed by the loss of blood we must have recourse to astringent or specific remedies. Amongst these the one entitled to most confidence is the solution or pommade of the nitrate of silver. Dr. Ridgway employed it in the proportion of ten grains to the ounce, dropped into the eye at the very commencement of the disease. O'Halloran "had become dissatisfied with the antiphlogistic treatment, from having found it frequently either insufficient or injurious, and was hence led to use astringents, not only in the early stage of the disease, but when the purulent discharge and chemosis were fully established. He employed the sulphate of copper in substance, rubbing with it the inner surface of the eyelids after evertting them, or he dropped into the eye the ten-grain solution of the nitrate of silver." Mr. Lawrence says, "Destructive or injurious consequences have so frequently resulted under the usual management of this disease, that I should certainly employ the local astringent if I met with a case favourable to the trial; that is, where the affection had not extended beyond the conjunctiva." Mr. Lawrence subsequently mentions two cases where the astringent was successfully employed; in the latter after a large bleeding.
Dr. Wallace recommends the application of the nitrate of silver after the abstraction of blood in sufficient quantity, "and when we have an opportunity of seeing the disease before the state of inflammation, this remedy should be employed without a moment's delay." After free depletion, Ricord recommends the eyelids to be everted, and the solid nitrate of silver to be passed over the surface of the palpebrae, and afterwards more superficially over the ocular portion of the conjunctiva; after this the surface of the eye is to be cleaned by a syringeful of cold water thrown over it, with a view of removing any portion of the salt that may remain upon the cornea. In the intervals of the dressings, the eye is covered with a compress, soaked in a decoction of poppy-heads, and applied cold. M. Ricord recommends also the application of the extract of belladonna to the temples and round the orbits during the treatment, with a view of preventing any adhesions of the iris, which commonly becomes affected, as well as other deep-seated structures of the eye. If the chemosis be great, Ricord recommends a portion of it to be removed with a pair of curved scissors, a measure of which Dr. Mackenzie speaks also in very high terms. If the inflammation do not yield speedily to large general depletions, M. Sanson, as we stated in our last Number, has resorted to the expedient of excising the secreting organ itself—the conjunctiva! He snips away with a pair of curved scissors all the salient portions of the membrane, and then cauterizes with the nitrate of silver the whole internal surface of both eyelids.

We think it perfectly useless, not to say criminal, in such cases, to waste the time, so precious to our patient, in administering the remedies looked upon as specific in gonorrhoea, as copaiva and cubebs, recommended by Dr. Wallace, and we are glad to find M. Ricord supporting this the true view of the matter. He says, "The anti-blenorrhceal remedies, properly so called, as copaiva and cubebs, have absolutely no action upon this disease, whatever may be their mode of administration."

We are not disposed to think very highly of the exhibition of
mercury, so as to produce even its full action in this disease, and we think Dr. Wallace quite in error in giving it as an antisyphilitic. We have before shown the fallacy of Dr. Wallace's opinions on these points. Mr. Lawrence has seen gonorrhœal ophthalmia proceeding unchecked under the full mercurial action. Ricord expressly states that it is of no service, so also do Beer and Delpech. There is no objection to its use in the chronic forms of disease; but we lose time, and compromise the vision of the patient by placing any reliance upon it in the acute.

Those authors who support the view of gonorrhœal ophthalmia being produced by metastasis place great stress upon the restoration of the urethral discharge; it is also recommended in cases where this ceases during an attack of disease of this character. Swediaur, Richter, Beer, and Scarpa recommend the introduction of a bougie smeared with the discharge from the eye, or with gonorrhœal matter taken from another patient. In spite of the authorities of these names, we think their recommendation rather the result of preconceived theoretical notions than deductions from the results of treatment. Mr. Lawrence supports the latter opinion, and the modern writers of the greatest experience, as Ricord and Desruelles, agree with him. "If," says Ricord, "the discharge from the urethra is for a short time diminished, during an attack of gonorrhœal ophthalmia, it is never completely suppressed, and we can affirm, in spite of contrary opinions, that not the least benefit is to be expected from attempting to restore or increase it." Swediaur, however, appears to have been successful in curing some chronic cases of this character by the restoration of the urethral discharge; but we cannot find in any late writer, neither have we ever seen, a case supporting the efficacy of this treatment.

Dr. Wallace thinks that the ill consequences which so commonly follow gonorrhœal ophthalmia, such as bursting of the cornea and discharge of the humours of the eye, protrusion of the iris, &c., may be prevented by evacuating the aqueous humour on the plan recommended by Mr. Wardrop.

"It has always appeared to me very probable that the sloughing
and ulcerating processes, which so often attack the cornea in this form of ophthalmia, are owing principally to distension of the eyeball by effusion into its chambers, for sloughing or ulceration is not a usual consequence of catarrhal syphilis in other parts, unless when strangulation has occurred; and acting on this opinion, I have on several occasions, and apparently with very considerable benefit, adopted Mr. Wardrop's recommendation of puncturing the cornea to cause the escape of the aqueous humour, and the consequent diminution of the state of distension."

We think these remarks very valuable, and the practice deserving repeated trials before it is finally rejected. Dr. Wallace's remarks are forcibly illustrated by Mr. Lawrence's sixth case, in which the eye literally burst from distension of this kind.

Mackenzie, Lawrence, Brodie, Ricord, and Wallace admit a true gonorrhoeal inflammation of the iris. This generally occurs in scrofulous patients labouring under gonorrhoea or gleet. Sometimes it succeeds to gonorrhoeal inflammation of the conjunctiva or the sclerotic, or occurs with that peculiar species of rheumatism which sometimes accompanies a gonorrhoea. It very commonly alternates with affections of the joints, and an acute attack of synovitis frequently cures or very much relieves the inflammation of the eyes. The frequency with which this species of disease succeeds to mild gonorrhoeal ophthalmia, and the facility with which adhesions of the iris take place, render it necessary that in the various forms of gonorrhoeal ophthalmia we should adopt Ricord's plan of keeping the pupil dilated by the external application of belladonna. "This affection of the eye is exactly the same as rheumatic inflammation of the sclerotic and iris occurring independently of gonorrhoea. Both this and the mild purulent inflammation of the conjunctiva are to be regarded as rheumatic affections of the organ excited by gonorrhoea; that is, they take place in individuals in whom this constitutional disposition is shown by inflammation affecting either the synovial membranes or the fibrous structures of several joints." Dr. Vetch, as well as the authors already mentioned, has given cases of this disease. In one instance, the go-
norrhœa was well marked and violent, and was succeeded by a swelled testicle; rheumatic inflammation of the joints and of the external proper tunics of the eye followed. They terminated in an irregular and contracted pupil, some opacity of the capsule of the lens, adhesions between it and the iris, and a considerable loss of vision. Generally, however, the prognosis is favourable, and the disease very much more under the control of art than the more acute forms of purulent ophthalmia. "The gonorrhœal is generally more rapid in its progress than any of the other varieties of iritis, and is one of the most severe and formidable whilst it lasts; but it yields more promptly to decided treatment than any of the rest, and affords examples of perfect recovery, even when the aqueous chambers are filled with lymph."

The treatment must consist, in the onset, of general and local bleeding, suited to the urgency of the symptoms; calomel and opium, so as rapidly to affect the system, and the application of the extract of belladonna. Our chief reliance must be on mercury united with opium and antimony, and if there exist a rheumatic state of the system, colchicum and turpentine will be useful. Sir B. Brodie places great reliance on colchicum. As local applications, warm decoctions of poppy are generally most agreeable to the patient's feelings, on account of the intolerable pain that sometimes attends the disease. "When the inflammation is checked, blisters may be advantageously employed, and the cure may be completed by the Plummer's pill, with mild aperients and regulated diet."

The second class of these diseases are primary syphilitic sores, the "maladies vénériennes primitives à forme ulcéратive" of Desruelles; the "affections virulentes" of Ricord. In investigating the therapeutics of this class of venereal diseases, we do not propose to enter into the particulars of the comparative merits of the mercurial and simple treatment, but simply to indicate that best suited to the different varieties of primary syphilitic ulcers. Though renouncing an indiscriminate mercurial treatment, most modern surgeons, more particularly those of this country, look upon mercury as the most powerful and certain therapeutic agent employed in a
vast majority of both the primary and secondary forms of syphilis. “Is there any experienced senior of the profession who, having a son of eighteen or twenty, and that son having a chancre, that would treat him without mercury? No: there is not such an unnatural person.” Mr. Carmichael, instead of rejecting mercury altogether on the one hand, or coinciding with Sir C. Bell’s sweeping dogma on the other, has wisely endeavoured to point out where mercury is admissible, and where it is not admissible in primary venereal sores. This seems also to be the aim of most modern writers on syphilis who have devoted particular attention to the enquiry. “Why,” enquires Mr. Parker, “is mercury to be employed in the treatment of primary syphilis? To hasten the cicatrization of the ulcer, and to diminish the risk of secondary symptoms.” The first point is established by the practice of most modern surgeons, both British and foreign. Ricord, Desruelles, and Cullerier, all partisans of the simple treatment, recommend mercury when the sore is indolent, does not cicatrize under the simple plan, when its edges are hard and elevated, or the sore leaves behind it, in healing, an indurated cicatrix.

“If,” says M. Ricord, “we calculate the cure of a chancre from the day the ulcer has cicatrized, without troubling ourselves about what may take place after, it will be sometimes apparently quicker by the simple treatment without mercury, and in the hospitals, the patients will be a less time under treatment; but if we date the cure at the period when all induration has disappeared, we shall find the difference enormously in favour of the mercurial treatment; the induration continuing in the first instance an indefinite period, and giving rise much more frequently to secondary or constitutional symptoms. I have recourse to mercury whenever a certain degree of induration accompanies a chancre, when it does not speedily cicatrize, or when the induration remains after its apparent cure.”

From M. Bacot’s summary it appears that secondary symptoms occur in the proportion of at least one in ten in those cases where no mercury has been given; whilst, on the contrary, the proportion
of such cases is only as one to seventy-five where that remedy has been employed. Mr. Carmichael admits that "mercury is an agent of great utility in some forms and stages of venereal diseases, when duly administered under sound pathological principles, and not blindly given as a specific." Mr. Carmichael exhibits it under the following circumstances:—

1st. In cases of the simple primary ulcer, when this does not yield to rest, the antiphlogistic treatment, and astringent washes. After the third or fourth week, Mr. Carmichael gives mercury in alterative doses with the same views that he would prescribe it for any indolent ulcer which was not venereal. This ulcer, amounting to nine tenths of the cases we meet with in practice, is characterized by its want of induration and phagedæna.

2dly. When the papular and pustular eruptions become scaly, and obviously on the decline, about the fourth or fifth week, and not yielding to sarsaparilla or antimonials, mercury is given in alterative doses with sarsaparilla.

3dly. In iritis, so as to produce its full effects upon the system.

4thly. In cases of nodes with inflammation of the periosteum. In the phagedænic forms of primary syphilis, Mr. Carmichael believes mercury in all stages and forms of the affection to be a most deceitful and dangerous remedy.

5thly. For the primary sore, the Hunterian chancre, with hardened edges and base, the "chancre induré" of M. Ricord, and for the scaly eruption which attends it, as well as the deep excavated ulcer of the tonsils, nodes, and other symptoms belonging to this form of disease, mercury, in full doses, may be esteemed a certain and expeditious remedy.

M. Ricord, admitting as he does the uncertainty in which we still remain with regard to the particular kind of sore in which mercury should be exhibited, remarks that in this form the surgeon who omits the full mercurial treatment, ought to be considered responsible for the constitutional symptoms which are almost sure to succeed it. The testimony of Mr. Guthrie is pretty much to the same effect in cases of ulcers which had "the characteristic of chancre." In these in-
stances, without the use of mercury, local applications of various kinds seemed to have little effect upon the sores, and they remained open for various periods, but all very long. "If they were ulcers without very marked appearance, and did not amend in the first fortnight or three weeks, they generally remained for five or seven weeks longer; and the only difference in this respect between them and the raised ulcer of the prepuce was that this often remained for a longer period, and that ulcers presenting the true character of chancre required a still longer period for their cure—that is, from six to eight, ten, or twenty, and even twenty-six weeks, healing up and ulcerating again on a hardened base." In this form of ulcer, Desruelles also admits the superior efficacy of mercury. When we are certain that no manifest cause of irritation interferes with the cicatrization of the sore, and that still remains indolent, a general mercurial treatment must be employed. "In these cases no medicine is so advantageous as mercury, and so marked are its effects, that we are tempted almost to regard it as a specific."

The universal tendency of modern experience, then, is in favour of the mercurial treatment of this form of disease, and although this, as well as the other forms of primary syphilis, may get well without mercury, still the cure is uncertain and prolonged, and generally leaves behind it a hardened cicatrix, prone to ulcerate again. It is doubly important to heal this, as well as the other primary forms of syphilis, speedily, since it is incontestably proved that the risk of secondary symptoms occurring is in direct proportion to the period a primary sore remains open; a primary sore closing with a hardened cicatrix is certainly not cured.

Mercury should not be given during the state of fever or local inflammation which may be present during the first days of venereal ulcers, nor till the patient is prepared for it by an appropriate regimen. It is also generally improper to use mercury during the ulcerating stage of chancre; it must be abstained from till the sore has become stationary and indolent, or till it assumes a disposition to heal. If mercury be employed during the ulcer-
ating, irritable, or inflamed condition of a chancre, it will most probably increase the inflammation, or "excite a state of irritable or indolent action, after which the system will become quite insensible to ordinary doses of this medicine; and if under such circumstances larger doses of mercury be employed, a peculiar and complex state will most probably result, determined in its character by the combined influence of the disease, the remedy, and the constitution of the patient, a state in which mercury acts as a poison, or, in other words, not only aggravates all the symptoms, but perhaps excites a new train of peculiar morbid actions." Mercury may be employed by friction, or fumigation, or the proto-chloride, the bichloride, the proto-ioduret, the cyanuret, or the deuto-phosphate may be employed internally, in different doses and under various forms of combination *.

Scarcely any two modern authors agree in their classification of primary sores, and hence we shall speak of those alluded to in the works before us after their pathological character, and not in conformity with the particular division of each writer under review. In this point of view, primary sores resolve themselves naturally into a few species, to which all those described by authors may be referred. These are: 1st. The simple primary sore, characterized rather by its negative than positive characters, i.e. by the absence of induration, irritability, or inflammation. 2d. The irritable. 3d. Those characterized by an excess of inflammatory action. 4th. The indurated, or true Hunterian chancre, the induration being a primary feature of the sore, and not being produced by the injudicious use of local stimulating dressings, "by the use of which," says Desruelles, "any primary sore may be made to assume the indurated character." 5th. Those spreading by rapid ulceration, or covered by foul sloughs of various colour and appearance. This variety being the ulcerative or sloughing phagedæna of the authors before us.

It will be necessary, before speaking of the local treatment of

* Vide Formulae at the end of this Treatise.
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chancre, to repeat what has been said on the division of primary venereal sores into two periods—the first that of ulceration, and the second that of separation or cicatization; the local remedies adapted to the first of these states being inadmissible and generally hurtful to the second.

In the majority of cases of simple primary venereal sores, during the first period, the nitrate of silver is the best application, and amongst the writers before us, Carmichael, Ricord, Wallace, Key, Parker, and Mayo support this practice. Ricord and Carmichael both state that the sooner an ulcer which secretes a morbid poison capable of infecting the constitution is healed, the more likely is the constitution to escape contamination. "When, therefore," says Mr. Carmichael, "a patient applied to me with an ulcer in its first stage, while yet excavated and secreting lymph, I instantly endeavoured to destroy its entire surface by a free application of lunar caustic; and I observed that when the eschar separated, I had in general the satisfaction of finding a simple sore, instead of a poisonous one." If the sore be much inflamed, the caustic is not to be used till the inflammation has been subdued by rest, aperients, general blood-letting if necessary, abstinence, and the mildest topical applications, as bread and water, or the turnip or carrot poultice, the liq. plumbi diacet. dilut., &c., &c.; should the ulcerative stage be passed, and granulations have sprung up under the treatment, which is sometimes the case, the nitrate of silver is of course to be omitted.

"Whilst a chancre continues in the state of ulceration, the application of the nitrate of silver must be repeated, waiting for the separation of the eschar produced by its application, to ascertain clearly the condition of the sore before we reapply the caustic. After the application of the nitrate of silver, the ulcer should be covered with a piece of fine soft lint, spread with some simple ointment, over which may be placed a bread poultice, of fine linen moistened in the liq. plumbi diacet. dilut., and the whole covered with a piece of oiled silk, or Liston's isinglass plaster."

During the two or three days which are generally spent in the
application of the caustic, the patient should be prepared by rest, regularity in his living, and mild aperients, for any subsequent constitutional treatment that may be thought necessary. Mr. B. Bell has condemned the use of the nitrate of silver to primary sores, under the idea that it produced bubo, and Cullerier still supports this view. Mr. Carmichael, however, proves that this is not the case; and Sir G. Ballingall, after noticing Mr. B. Bell's statements, goes on to say, "that of late years he has been in the habit of at once destroying the surface of primary sores with caustic, when of a limited extent, and this practice has been for the most part highly satisfactory; nor," continues Sir G. Ballingall, "could I be justified in saying, that it has produced buboes in any thing like that proportion which Mr. B. Bell's statements would lead us to expect." As local applications generally to primary sores, Sir G. Ballingall recommends anodyne fomentations, or cataplasms, or stimulating lotions, according to the character of the ulcer; of the latter he mentions particularly the diluted nitric or muriatic acids, solutions of the oxymuriate of mercury, or of the chlorurets of lime and soda.

All irritating or mercurial dressings are to be avoided during the ulcerating stages of chancre, and during the period that the sores are irritable or inflamed. Dr. Wallace states that the most appalling forms of syphilis which he has met with, have been owing to the injudicious application of mercurial dressings to chancres in a state of ulceration, irritability, or inflammation. Mr. Carmichael's views correspond.

"Attacks of inflammation . . . . . . caused by neglect, imprudence, irritating applications, or the use of mercury, may so modify and alter the natural appearance of these primary ulcers, as to render it difficult to ascertain to which class they belong. Under these circumstances, instead of flying to the use of mercury, as is too frequently the custom, I would strongly recommend you to avoid the inextricable embarrassments and difficulties to which this rash step may lead you, and to be contented with directing antiphlogistic measures to the necessary extent, mild soothing applica-
tions, and rest in the recumbent position, until all inflammation is
removed; and then, and not till then, can you be competent to
form any correct judgment respecting the true nature of the ulcer,
and its appropriate treatment."

Mr. Key thinks mercurial washes in the early stages of chancre
are peculiarly noxious. The morbid action is rather increased
than allayed by them, secretion being rendered more copious, and
the ulceration more inclined to spread. Ricord condemns the use
of ointments generally in the ulcerating stages of chancre; some
remedies are employed by him, Cullerier, Desruelles, &c., in the
French hospitals, which are found highly useful in the earlier
stages of chancre; amongst these may be mentioned the opiate
cerate, and the aromatic wine with tannin or opium. The opiate
cerate is composed of an ounce of the vinum opii to a pound of
adeps, and is very useful as a simple dressing to irritable primary
simple sores; a strong decoction of poppy, to which may be added
some of the extract of opium, in the proportion of eight grains to
the half pint, may also be employed.

Ricord's favourite dressing is the aromatic wine of the French
Codex; this is made by digesting four ounces of aromatic herbs
(rosemary, rue, &c., &c.) in two pints of red wine for eight days.
In certain circumstances, two scruples of pure tannin are added to
eight ounces of the wine; and when a sedative application is wished
for, half a drachm of the purified extract of opium. The patient
is directed to wash the ulceration with these applications gently,
without making them bleed, and afterwards to cover the surface of
the sore with some fine soft lint moistened with the wine, without
making it too wet. To these local remedies M. Ricord attributes
the effect of hastening cicatrization, of diminishing the secretion
of pus from the surface of the sore, and by their astringent pro-
properties, acting upon the surrounding tissues, of preventing the ex-
tension of the disease and the formation of fresh chancres, a cir-
cumstance very common with the ordinary modes of dressing.

The more mildly primary sores are treated locally, the less likely
are they to be followed by those appalling complications which
sometimes accompany them, such as rapid ulceration, sloughing, and disorganization of a great portion of the penis and scrotum, and which used to be so common under the old treatment of stimulating mercurial applications during the first days of chancres. We dwell upon this point because we deem it of the first importance: whilst we have almost the universal testimony of modern writers on syphilis in its favour, there are yet some surgeons of the present day, in the very teeth of evidence the most convincing, as a glance upon the publications on our table would show, who adopt a sort of routine black and yellow wash system to primary sores of whatever character. To well understand the principles on which the local as well as the general treatment of primary sores must be conducted, the surgeon must constantly bear in mind the two phases of chancre, as established by Ricord and Dr. Wallace, and admitted by Mr. Carmichael and Mr. Key, and most modern writers. In the first stage we have to do with a specific sore, irritable, and poisoned, and poisonous, liable to be irritated by the least stimulus, whilst in the second we have a simple ulcer, destitute of all these characters.

"To the premature use of mercurial dressings, much of the troublesome career of primary sores may be attributed; their injurious action is seen in the conversion of the surface into a yellowish mass, a change that usually indicates ulceration, an increase of secretion, a disposition to spread, and an increased degree of sensibility; and as soon as these applications are replaced by astringents, the changes in the appearance of the sore show on what its previous condition depended. The same remark will not have escaped the experienced surgeon, in the influence of mercury, internally administered, on these sores; and while they remain in the ulcerative stage, it should be sparingly given and cautiously watched."

There are some forms of primary sores to which Mr. Key recommends mercurial dressings in the ulcerating stage. These he employs not as a general rule, but as the exception, in sores indolent not sensitive, and secreting but sparingly. Ricord also alludes to
this species of primary ulcer, which he describes as indolent and stationary, and in which the secretion is dried up; in these circumstances the aromatic wine, with this exception almost universally employed by him as a general dressing, is to be abstained from, and the opiate cerate or emollient fomentations employed in its stead. We have been in the habit of treating this species of primary sore, which is frequently met with at the orifice of the urethra, by washing its surface with a weak solution of the chloride of lime, and then dressing it with some detergent ointment.

The indurated primary sore demands a treatment both local and general, in some measure different from the ordinary forms of the disease. This, “the classic Hunterian chancre” of Ricord, the indurated primary syphilis of Dr. Wallace, is the form of primary disease for which every author on our list recommends a full mercurial treatment till the sore has healed without induration of the cicatrix. In our account of this species of ulcer, it must be recollected, that we limit the expression “indurated” to an ulcer that is so from the commencement of the disease, and do not apply it to those sores which have become indurated from the repeated application of stimulating dressings.

This induration, the natural character of the sore being changed by irritating applications, Mr. Carmichael calls “setting a sore astray,” from its regular natural history; and with respect to the particular kind of sore of which we are now speaking, it is very liable to be so changed, hence Dr. Wallace says, “when the induration is not the consequence of common irritation from mismanagement.” This point is also particularly insisted on by Desruelles. Local treatment is not generally so efficacious in ameliorating the condition of this as the other varieties of primary syphilis, the sore is not commonly much benefited except through the medium of the constitution. Ricord recommends as a dressing to the simple indurated chancre, a pommade of calomel and opium. Dr. Wallace also countenances this under the regulations laid down for the treatment of primary sores generally. If suppuration is abundant, the sore is to be washed previously to the dressing with
the aromatic wine; should the sore be irritable or inflamed, and
the ulceration disposed to spread, aqueous solutions of opium, an-
dyne fomentations, &c., must be used. The application of the
nitrate of silver is not so beneficial in this as the other forms of
disease, nevertheless, both Ricord and Wallace advise its use. The
former says, "it modifies favourably the surface, and frequently
arrests the spread of ulceration;" after the ulcerating stage has
passed, great advantage will be derived from the gentle application
of the sulphate of copper. In the more decided chancre, i. e. the
indurated sore of which we are speaking, Mr. Key thinks the
"disposition to be set astray is less, and the syphilitic characters
being more developed, mercurial application agrees better with
them, and may be applied with less apprehension of the ulceration
extending. In these sores local mercurial action does not render
the secretion copious; nor does it render the surface yellow, loose,
and spongy, or the edge disposed to break up . . . . . On the
contrary, the edge becomes less raised and firm, but not disposed
to extend by ulceration; the secretion is altered, but not increased;
the surface becomes more solid and fibrinous, and inclined to gra-
nulate."

Dr. Wallace gives some good diagnostic marks by which we are
enabled to distinguish between the induration which is the natural
attendant upon this species of sores, and that which is produced in
ordinary simple sores by the injudicious application of remedies.
"We may always distinguish by the history of the case, and by the
character of the areola, such indurated ulcerations as are connected
with irritation or inflammation. Thus, if indurated primary syphilis
be not attended by these morbid states, it will not be surrounded
by an inflamed, but by a callous or livid white areola, with or with-
out a whitish line at the very edge or margin of the ulcerated sur-
face; or else the skin surrounding the ulcer, will present its
natural appearance."

There is one symptom succeeding to indurated primary chancre,
which sometimes occasions considerable anxiety to the patient and
annoyance to his surgeon; this is "induration of the cicatrix."
After the healing of a primary sore of this character, the cicatrix remains hard and elevated, and is prone to ulcerate anew on the occurrence of the slightest exciting cause. Delpech, Wallace, Ricord, and Cullerier particularly allude to this induration of the cicatrix, which is considered to denote the persistence of syphilitic action in the system, and the "forerunner of accidents to come." It has been proposed to destroy the induration with caustic, or to excise it with the knife: both these methods are objectionable; the former frequently occasions foul and intractable sores, which Delpech terms "l'état cancereux," and the removal with the knife commonly produces a new venereal ulcer more intractable than the first, which in healing may leave a fresh induration behind it. This is a sort of "noli me tangere" disease, which we must be very careful how we interfere with, at least with irritating topical remedies, as escharotics, blisters, or the knife. We seem to have no alternative but to follow the practice of Dr. Wallace, which is at best but a palliative one. "My conduct in this point of practice is to persevere with the use of mercury, provided it agree with the system, for at least ten days or a fortnight after the induration or contraction may have ceased to diminish; and whatever degree of these states may then remain, I leave to the slow operation of nature, or to be removed at a future period by the knife, in case this should be desired by the patient, for the purpose of curing aphymosis or any other inconvenient deformity."

This is the most formidable and uncontrollable variety of primary syphilis. The cause of phagedena is an interesting matter of enquiry. Desruelles, in the true spirit of Broussaisim, attributes it to irritation of the viscera, a chronic gastritis, a gastro-enteritis. Ricord believes also, that there is commonly an accompanying visceral irritation, but he believes, moreover, that a cold damp atmosphere disposes primary sores to become phagedænic. Mr. Mayo states, "that what gives the phagedænic character to sores on the genitals after infection, is some peculiarity of the general habit." This is perhaps true, but the difficulty is to know in what this peculiarity consists. We have sometimes seen inflammation, mor-
tification, and death succeed the slightest scratches; and this is not uncommon in the draymen and porters of London, who consume large quantities of gin and porter.

Phagedæna is generally divided into the ulcerative and sloughing, Dr. Wallace has attempted a classification which he thinks "may be of some practical importance towards the discrimination and management of these frequently formidable diseases."

**Phagedænic Primary Syphilis.**

   c. Irritable.      c. Irritable.      c. Irritable.

The local remedies best suited to the different varieties of simple phagedæna are the nitrate of silver, either solid or in saturated solution, applied with a pencil; the pure nitric or nitro-muriatic acids, the white muriate of antimony, or a saturated solution of the oxymuriate of mercury in alcohol. In the sloughing or foul varieties of the simple phagedæna. Ricord recommends as very serviceable alternate dressings of the aromatic wine and a detergent ointment: the surface of these sores may be washed frequently with strong solutions of the chlorurets of soda and lime.

In the inflamed variety we must employ rest, "general and local" blood-letting, emollient fomentations or lotions, and poultices, purgatives, antimonials, and abstinence. Ricord says he is very wary of local blood-letting, in this or any other form of primary syphilitic sore. He condemns the practice, so common in many of the French hospitals, of applying leeches in the centre of the sore, which commonly occasions an extension of the ulcer in depth to the extent which has been divided by the bite of the leeches; there is also a paramount objection to their application in the immediate vicinity, which is the inoculation of the leech-bites by the secretion from the surface of the ulcer, which is most likely to occur, and the consequent formation of fresh venereal sores.
In the inflamed varieties of phagedæna with white or black slough, Dr. Wallace thinks the application of the nitrate of silver hurtful, and in fact we should do well to observe what he says of its use in phagedæna generally, that used too long or repeated too often, it will produce consequences in some respects as unpleasant as those which result from an overdose of mercury. In the inflamed phagedæna with or without slough, a purely antiphlogistic treatment, with anodyne fomentations and poultices, is the safest practice; leaving the application of stimulants and caustics till all local and constitutional irritation has subsided.

The irritable phagedænic ulcer demands a local treatment different from that of either of the before-mentioned varieties. Ricord and Wallace employ the nitrate of silver, the liquor arsenicalis, or the strong nitrous acid. These, however, frequently dispose the ulceration to spread, particularly where the sore is surrounded by a diffused areola. When this is the case, the opiate cerate or strong aqueous solution of opium may be employed, whilst this remedy should be given freely at the same time by the mouth. Amongst preparations of this character, Dr. Wallace speaks highly of mercurial ointment with the ext. opii, a drachm of the latter to an ounce of the former, or the mel rosæ with laudanum. As a general application to these sores, in our own practice, we have succeeded better with turnip or carrot poultices than with almost any other form of remedy. There are, however, individual circumstances depending on the character of the sore, its degree of indolence, irritability, or inflammation, in which the remedies we have mentioned will find their application.

The writers before us are divided as to the propriety of the mercurial treatment in phagedænic primary syphilis, Mr. Carmichael agreeing with the French school in rejecting the remedy as most dangerous and deceptive in every variety of the disease. "The miserable mutilations and sufferings," he says, "which our soldiers endured in Portugal from phagedænic and sloughing ulcers, at the commencement of the Peninsular war, by the exhibition of mercury, might have inspired the deputy-inspector of hospitals with a
desire to obtain information on the treatment of venereal complaints from every source; for our army surgeons soon discovered that the black lion of Portugal, as the sloughing ulcer was termed, could not be tamed by mercury, and that without giving a grain of it the Portuguese practitioners knew better how to effect their object. Sir G. Ballingall, after an experience of many years, informs us, in his recent work, that he quite accords with Mr. Carmichael. Mr. Key, in his report of the primary syphilitic cases occurring at Guy's hospital, states that, in the constitutional treatment of these sores, mercury is wholly inadmissible. "It tends," he says, "to increase irritability, to lower the powers of the patient, and therefore to quicken the phagedænic action. Loss of rest, and the irritability of the arterial and nervous systems to which it gives rise, are the prominent points in these cases." We perfectly agree with these authors in condemning the use of mercury generally in phagedænic primary syphilis, yet we are of opinion, and the results of every day's experience confirm this opinion, that there are cases of this character frequently occurring, in which mercury judiciously employed is our best remedy; and this is just the way in which Ricord views the question, when, in speaking of phagedænic chancre, he says, "there are circumstances under which a mercurial treatment is followed by the best results, and this fact is constantly proved by the practice of those who avow the most deadly hatred to mercury." It remains, however, to be determined what are the forms of phagedæna in which mercury may be employed with advantage. Ricord thinks it impossible, in the present state of science, to point out with certainty what these circumstances are. If the disease continues to advance in spite of the usual remedies judiciously employed, as a sort of forlorn hope he has recourse to mercury, first in form of local application, and subsequently by the mouth or friction. He is regulated in the continuance of the remedy by the effects produced, continuing it if the disease appears inclined to yield, or giving it up should it still continue to extend. Mr. Lawrence, whilst he condemns the indiscriminate use of mercury in phagedæna, believes there are cir-
cumstances in which it may be employed with advantage, though
he, like Ricord, does not seem able to point out what these circum-
stances are. He states that it has often happened to him to see
cinnabar fumigations, employed as a local remedy in phagedænic
ulcerations of the throat, accidentally cause copious salivation, and
that in many instances where he had seen this, he had found that
the local disease in the throat, as well as in other parts, proceeded
very favourably; so that he would not lay it down as an absolute
rule that mercury ought never to be employed in these cases in re-
ference to its general effect upon the system.

We think Mr. Carmichael has written in too exclusive a spirit of
partisanship, when he condemns mercury as poisonous in every
variety and form of phagedæna, particularly when he goes so far
as to say, that he would not even permit the use of a few grains of
cinnibar as a fumigation, for fear of mercurializing the whole
system. The recorded experience of most modern writers on
syphilis, to whatever school they may belong, proves that there are
constantly occurring cases of phagedæna so intractable under the
ordinary treatment, that mercury is fled to as a last resource, and
there are many of these in which it is perfectly successful. "Nor
must it be denied," says Mr. Mayo, "that occasionally a short and
brisk course of mercury will give a new turn to the complaint, and
cause these troublesome sores at once to close. This remedy,
however, should be last resorted to."

Dr. Wallace has endeavoured to discriminate between those
forms of phagedæna in which mercury should be used, and those
in which it should be abstained from: he believes that all the
varieties of phagedænic primary syphilis have hitherto been very
much confounded together, to the injury of the patient, and the
confusion of the practitioner. Dr. Wallace's classification of these
sores is not founded on the incipient or primary character of the
sore, but upon the appearances it may assume during its course,
which evidently depend on constitutional causes; the chief di-
visions being founded upon the degree of irritability or inflam-
mation attending a primary sore, or the character of the slough
with which it may be covered; this will be seen by referring to Dr. Wallace's table already quoted. In the first variety of phagedæna, the simple primary sore without slough, characterized "merely by an unusual persistence or activity of the specific action attendant on the ulcerative stage of primary syphilis," Dr. Wallace thinks mercury almost indispensable, and recommends the patient to be brought as quickly as possible under its full influence. "But," he adds, "if the patient has been dabbling with mercurial remedies, and if there be reason to suppose that his constitution has been, in consequence, more or less disordered, we shall act more judiciously by suspending, for a time, the use of mercury, and endeavour, by proper measures, but principally by attention to the mode of living of our patient, and by the use of the mineral acids with sarsaparilla, to restore the system to a state of tranquillity, before we enter again on mercurial treatment; which may, however, be then used with success."

In the inflamed variety of simple phagedæna, the first indications are the reduction of the inflammation according to the principles already laid down. Mercury may be used at the discretion of the practitioner, when the ulcer has put on the reparative process, in the way before recommended for simple primary sores.

In the irritable variety of simple phagedæna without slough, mercury is to be interdicted. Dr. Wallace believes that in this form of the disease the remedy is always injurious, and if persevered in, produces an increase "of irritability local and general, and hectic and secondary symptoms of a very unmanageable kind may result." In this form conium, hyoscyamus, opium, and Dover's powder, but more particularly opium, locally and generally, are the chief remedies to be relied on, with sarsaparilla in conjunction with the iodide of potassium, or the mineral acids, or Mr. Carmichael's favourite remedy, the cold compound or simple infusion of sarsaparilla in lime water. It is in these cases that Mr. Lawrence also thinks sarsaparilla most beneficial. In the three forms of phagedænic syphilis without slough, Dr. Wallace
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recommends a full course of mercury in the first or simple form; an active antiphlogistic treatment to precede the mercurial treatment in the second or inflamed variety; and measures calculated to tranquilize the system in the third or irritable.

In the "simple phagedænic primary syphilis with white slough," Dr. Wallace recommends mercury to be freely exhibited, "wherever it may be seated, and of whatever extent it may be." With the constitutions, however, in which this sore occurs, mercury is very apt to disagree; and although the disease may be influenced beneficially, and the remedy, properly administered, may quickly excite such sores to separate their sloughs and cicatrize, a prolonged use of the remedy commonly induces a state which Dr. Wallace calls "febrile mercurial irritation;" and if mercury be continued after this condition of the system has been induced, the sore soon becomes "stationary and sensitive," and afterwards "painful and spreading," whilst secondary symptoms of a malignant character frequently set in.

This species of disease is particularly liable to occur at the orifice of the urethra, or just within the opening of the glans; and we have seen cases characterized by the patient on the onset, merely by a sanious discharge from the urethra, where this passage has been speedily perforated, and the glans partially or totally lost. We would impress upon the surgeon the necessity of examining the urethra in all discharges from it of this kind, since in many instances, two of which are now under our own care, these discharges are from the surface of the white phagedænic chancre, seated just within the orifice of the urethra. Dr. Wallace alludes to cases of this kind.

The characters of the "inflamed phagedænic primary sore with white slough," are a slough of white colour at the junction of the sore with the living parts, which parts are in a state of inflammation. The distinctive character of the sore is to be drawn from the colour of the slough at the junction of the ulcerative with the living parts, and not from the colour of the slough on other parts of the sore, since these occasionally become black or
green from the exposure of the surface to the atmosphere. The first indication in the treatment of this sore is the reduction of the inflammation, by an active antiphlogistic treatment, employed according to the circumstances of the case, generally and locally. We would beg, however, the attention of the reader more particularly to the point we are now endeavouring to make more clear; viz., the indications for the use of mercury in the different forms of phagedæna; and, with respect to the sore under notice, Dr. Wallace states that he has ascertained "an important fact,—that mercury, if given in full doses, or so as to produce rapidly its effects on the system, will control, even in its most inflamed state, the progress of the phagedænic disease just described."

Dr. Wallace "does not mean to say," that this practice should, in all cases, be ordinarily adopted, but believes that in many cases it will afford the chief, if not the only protection to the patient, when the disease is making havoc amongst parts of great importance. When employed in this form of disease, it must be combined with an antiphlogistic general treatment, as general and local bleeding, and nauseating doses of antimonials. In support of this position, Dr. Wallace adduces a case of obstinate and destructive inflammatory phagedæna. In this instance, "much time had been spent in fruitless endeavours to control the progress of the disease," the usual remedies had been tried in vain, till the prepuce was lost, with part of the glans, and a large portion of the covering of the testicles. So great was the attendant irritability and inflammation, that mercury "was the last remedy one would have ventured to try." The patient was importunate, and threatened to leave the hospital if mercury were not used. Large alterative doses had been employed without effect; it was now given in full doses: "his mouth was made very sore, and the progress of the disease was not only controlled but almost entirely stopped." Dr. Wallace noticed that "wherever the disease had been extending by a white slough, there or on such parts, though inflamed, the mercurial treatment had acted most beneficially; but that, on the contrary, at some points, where the sore
was extending by a black slough, its progress remained uncontrolled, or rather aggravated." Dr. Wallace is not satisfied with the degree of inflammation surrounding a primary sore as a rule for the non-employment of mercury, and founds his opinion upon the value of mercury freely administered in syphilitic iritis, and upon the fact that mercurial fumigations, in certain destructive sores of the throat, are frequently very beneficial, although attended apparently by great inflammatory action. The result of Dr. Wallace's experience in the employment of mercury in these cases has led him to establish a rule, to which we are disposed to attach very considerable importance:—"That although that form of inflammation which supervenes, when a patient is under a mercurial course, is sure to be aggraved by persisting in the use of mercury, this remedy will powerfully assist to subdue inflammation which commenced under different circumstances."

In the "irritable variety of phagedæna with white slough," Dr. Wallace also thinks a short but full course of mercury the best remedy, if the case have not been previously mismanaged. When it is used, it must be very carefully watched, and combined with large doses of opium, Dover's powder, cicuta, hyoscyamus, sarsaparilla, and the carb. of ammonia, whilst the local treatment must be anodyne and unstimulating. All the forms of phagedæna with white slough are, in the opinion of Dr. Wallace, favourably influenced by mercury. He considers this form of disease to be the result of inordinate action, "syphilis in an acute form, modified by peculiar states of constitution." These peculiar states of constitution, of whatever nature they may be, must render the surgeon circumspect in the employment of mercury, particularly in the outset of the disease, or as a specific remedy; but where the ulceration spreads with rapidity, uninfluenced by the general treatment, and threatens the loss of important parts, mercury must be used; but, says Dr. Wallace, "until our path be more clear, we shall run much less risk, in doubtful cases, of doing mischief by refraining from than by employing mercury."

The "simple primary phagedæna with black slough" of Dr.
Wallace, is analogous to the sloughing ulcer of Mr. Bacot, and is evidently merely a variety of the true Hunterian chancre, an indurated primary sore, with a dark or livid coloured slough. Its characters are, "much greater induration of the surrounding parts than any of the other forms of primary phagedæna, scarcely any inflammation, and attended by very little sensibility." Dr. Wallace states, that it requires any other form of treatment than the regular primary disease. It is often very much benefited by the internal employment of the nitrous, or nitromuriatic acids; but "the actions of reparation and perfect cicatrization may be produced in it with much more certainty, in a much shorter time, and with less expense to the constitution, by a mild and well regulated course of mercury than by any other means."

The disease, however, generally occurs in constitutions very susceptible of the mercurial influence, and hence the exhibition of the remedy requires more caution in its management than in the simple primary sores. Dr. Wallace thinks that great advantage will be derived from the occasional interruption of the medicine, and from substituting, during its omission, remedies that are calculated to improve the general health, and tranquillize the nervous system.

The two remaining forms of phagedæna are the inflamed irritable varieties, with black slough; the sloughing phagedæna of authors generally; the gangrenous ulcer of Mr. Bacot; and the "chancre phagédénique gangreneux" of Ricord. In these forms all writers agree in condemning the use of mercury; the disease is to be treated on the principles which should regulate us in the management of similar diseases arising from causes not syphilitic.

It must be recollected, however, when the sore has been brought to granulate and heal by proper remedies, that it has had a venereal origin; and perhaps has succeeded to a regular primary sore, rendered gangrenous by irregularities and bad management, and that it may be followed by secondary symptoms.
"It is more than probable," says Mr. Bacot, "that secondary symptoms will not ensue; and if they should, it will be time enough to arrest them when they appear. But it is, I think, not only fair towards the patient, but prudent to explain to him the probabilities of the case, that his attention be awakened by any deviation from his usual state of health, and that no time be lost under a mistaken view of his condition."

In concluding these notices of the employment of mercury in different forms of primary syphilis, we beg impressively to call the attention of our younger readers to Boerhaave's remark, "that he knew of no remedy but what became so by proper employment," and to that of Sir G. Ballingall, that "in the hands of a judicious practitioner, mercury will fulfil a number of different and apparently contradictory indications; in the hands of ignorance, temerity, or indiscretion, it will do more harm than good." It certainly must be used in a truly eclectic spirit, and not in conformity with the exclusive spirit of partisanship, or the dogmas of this or that school.

The work of Lucas Championnière, which contains an account of the views of Cullerier, and the practice adopted by him at the Civil Venereal Hospital, Paris, has some valuable remarks on the pathology and treatment of chancres in the female, and with a notice of these we shall conclude our account of the views of modern authors on "primary syphilis." M. L. Championnière begins by remarking that all that has been hitherto written on the contagion of syphilis before the discovery of the speculum, and its application to the examination of the deep seated portion of the vagina and the neck of the uterus, is to be considered as perfectly valueless, since the disease in the female which contaminates the male is much more frequently seated on the neck of the uterus than on the external parts. There are constantly presenting themselves at the venereal hospital females who have no trace of disease on the external parts, but who apply for assistance because they have produced disease in healthy men who have cohabited with them. On examination with the speculum, these females are
found to suffer from different forms of disease of the neck of the womb, which is not manifested by any external sign, or in fact by any symptom whatever. These facts, noticed by M. Cullerier, corroborate Dr. Ferguson's oft-told tale of the Portuguese operadancer. The affection of the neck of the womb presents numerous forms, all of which M. Cullerier thinks are capable of producing ulcers of the penis from cohabitation. In the first form, the neck of the uterus is red, swollen and hypertrophied, but not in a state of ulceration. If erosions exist, says M. Cullerier, they are so slight as not to be perceived by the naked eye. The state of the neck of the womb, in this variety of complaint, resembles very much that of the glans penis in balanitis or external gonorrhoea. More frequently the neck is covered with ulcerations, more or less numerous and more or less deep, from which oozes a virulent sanies. M. Cullerier thinks these are true chancres. They resemble chancres of the penis, in their history, their duration, and more particularly in the fluid they secrete. Occasionally M. Cullerier has found the true indurated chancre upon the neck of the womb, though this form is not so commonly met with as the other varieties.

We shall not follow M. Cullerier through the treatment he recommends for primary sores in this situation. They are to be dealt with in the same manner as primary venereal sores generally; the situation in which they occur is the only circumstance which can in any respect modify the treatment, and hence it is almost impossible to cure them properly without the occasional use of the speculum, to separate the parts for the purpose of cleaning them thoroughly by injection, or applying any local remedies the nature of the sores may require. M. Cullerier states that the situation in which these sores occur renders their speedy cure very difficult; and whilst chancres on the penis are generally healed in two or three weeks, these diseases of the neck of the womb commonly require as many months. M. Desruelles corroborates also Cullerier's statements of the frequent existence of true venereal sores on the neck of the uterus. In the deep-seated parts of the vagina chancres are
rare. These chancres may exist, as we have before shewn, an indefinite period of time, without producing constitutional symptoms, and without the patient being aware of their existence.

In the excellent memoir of Dr. Hauck, most of the conclusions of the French authors relating to the primary syphilitic affections in the female, are corroborated by the results of his own experience; and the absolute necessity of the speculum in the diagnosis and treatment of these cases is clearly demonstrated.

II. Constitutional Syphilis.—The phenomena of constitutional syphilis are divided by M. Ricord into secondary and tertiary, a division which in some measure harmonizes with the ideas of Hunter developed in his account of the first and second order of parts affected in lues venerea. M. Ricord thinks that the reason why the treatment of this disease is commonly so uncertain and unsatisfactory is, because its natural history is not clearly understood; hence the necessity of dividing syphilis into different stages, all of which are perfectly distinct from each other in their pathology, their phenomena, and the parts of the body in which they make their appearance. A distinct treatment is, in M. Ricord's view, to be framed for the management of each of these varieties, the remedies which are useful in one stage being comparatively inert in the others.

Primary syphilis may be succeeded by a series of affections which are termed by M. Ricord "successive," but are not truly secondary. Such are the diseases which result from the simple extension of the primary local disease, and of this character are fresh chancres, abscesses simply inflammatory or virulent, and buboes partaking of the like distinction.

Secondary symptoms, or those of general infection, arise when the venereal virus has undergone some degree of modification, by being mixed with the blood, and thus producing what M. Ricord terms the "syphilitic temperament." The diseases which may properly be termed secondary, seldom occur before the end of the second week after the appearance of the primary disease; more commonly, however, they appear about the fourth, sixth or
eighth week, and commonly at a much later period than this. Secondary syphilis attacks the skin, the mucous membranes, the eyes, the testicles, &c. The great peculiarities to be observed in these forms of the disease are, that they are not capable of being transmitted by inoculation, but from parent to child by hereditary taint. These "secondary accidents" of Ricord correspond to Hunter's first order of parts affected in "lues venerea," which he states to be the skin, tonsils, throat, inside of the mouth, and sometimes the tongue.

Tertiary symptoms appear at an indeterminate period, succeeding the primary disease, but commonly not till a long period after this has been cured; and in a majority of instances, not till after secondary symptoms have appeared, or whilst they are still present. The tertiary symptoms are nodes, tubercles of the skin or cellular tissue, periostoses, exostoses, diseases of the bones and fibrous system generally, and many internal affections not clearly defined. The tertiary symptoms are neither capable of propagation by inoculation nor of transmission by hereditary taint—at least, under any specific form of venereal affection. The tertiary symptoms are analogous to Hunter's affections of the second order of parts, which consists of the periosteum, fasciae and bones. It is in this latter class of affections that M. Ricord thinks the iodide of potassium so worthy of confidence.

Before entering into the consideration of the treatment, properly so called, of the constitutional forms of syphilis, M. Ricord devotes a short chapter to the examination of the question of the preventive treatment, remarking that it is against this that our care should chiefly be directed, since the primitive diseases are comparatively easy of cure by various remedies, and sometimes disappear spontaneously.

M. Ricord believes the probability of the occurrence of secondary symptoms to be in some measure in proportion to the time that the primary sore remains open. He has never seen a case in which the primary sore, healed in five days, has been followed by secondary symptoms; hence, says M. Ricord, the best
rule that can be given for the prevention of secondary symptoms is the radical cure of the primary disease, without induration of the cicatrix, in the shortest space of time possible. And for this purpose, he speaks with more confidence of mercury than of any other remedy, but considers it valuable rather as a remedy calculated to cure the primary disease, than to prevent the secondary.

If there is any kind of treatment calculated more than another to favour the appearance of secondary symptoms it is that which has not radically cured the primary disease. M. Ricord thinks that all persons are not susceptible of secondary symptoms, and he states that the occurrence of the latter is favoured by peculiar idiosyncracies, not well defined. Sudden changes in the accustomed mode of living of the patient or his habits generally, pregnancy, the critical period of life, gastric disturbance, habitual irritation of the throat, mouth, or skin, scrofula, &c., M. Ricord specifies as causes predisposing to the occurrence of secondary affections: hence, in addition to the radical cure of the primary symptoms, our second grand principle is attention to the general health.

It will be quite unnecessary to follow M. Ricord through his account of the general treatment of secondary syphilis. The general remedies are included under the heads of antiphlogistics, diet, baths, the state of the prime viæ, and some other points of minor importance. In reference to these heads, as to most others, M. Ricord is purely eclectic in his practice. Attached to no particular school or dogmas, he states merely what remedies have succeeded best in the vast number of patients he is called daily to treat. Apart from any specific treatment in the management of secondary syphilis, he adopts that general system of hygiène which agrees best with his patient. We agree with him, however, in thinking that no specific rules can be laid down; they must be left to the discretion and judgment of the surgeon.

It is to a mercurial treatment in confirmed constitutional syphilis, says M. Ricord, that we must give the preference, provided
there are no contraindications. The deductions made by M. Humbert from the results of M. Biett’s practice at the hospital St. Louis are,—That of all remedies mercury is the most efficacious in curing constitutional syphilis which exists without acute inflammation, but that it is better abstained from in irritable subjects feebly constituted. It cannot be denied, continues M. Humbert, that the preparations of mercury cure confirmed secondary syphilis more frequently than any other remedy. Mr. Mayo says, “of the remedies for constitutional syphilis, mercury is so far the most important that it is the only one, however rarely it may be necessary to use it with this object, through which the immediate extinction of constitutional lues can be anticipated; and that besides, as a repellant of the disease, it is one of the most efficacious.”

The preparation of mercury chiefly employed by M. Ricord in the treatment of constitutional lues is the proto-ioduret, the hydrargyri iodidum of the London Pharmacopoeia. He commences with one grain for a dose, combined with opium, and carries it as far as six in the day, but does not exceed this quantity. Cullerier prefers the iodide in the constitutional forms of the disease, administering it, at the venereal hospital, in the proportions of half a grain night and morning, combined with opium and guaiacum. In Biett’s hospital, the St. Louis, the bichloride is generally preferred in very small doses, and this was Dupuytren’s favourite remedy.

A certain degree of restlessness or irritability generally accompanies constitutional syphilis, which is so much benefited by opiates, that M. Biett’s practice has constantly furnished numerous cases where these affections have disappeared under the influence of opium alone, uncombined with mercury. The same views are supported by Ricord. Cullerier states “that opiates possess very marked anti-syphilitic properties, and even administered alone have produced some very remarkable cures.” The term anti-syphilitic is clearly not to be understood in this sentence in a specific sense, but there can be no question of the vast utility of opium, used both generally and locally, in all forms of the venereal
disease. Dupuytren was in the habit of using the bichloride combined with the extract of aconite with the same view.

Wallace, Ricord, Cullerier, and most other surgeons have lately employed the iodide of potassium largely in the various forms of constitutional syphilis. Ricord (Gazette des Hôpitaux, March, 1839) has established that its results are most happy in the tertiary forms of disease, in affections of "Mr. Hunter's second order of parts," in which he considers it the remedy "par excellence." Iodine of itself is a powerful anti-syphilitic, but, unless in a state of combination with mercury, is inadmissible in the treatment of the simple primary forms of disease. The iodide of potassium is chiefly employed by Cullerier in chronic syphilitic affections of the testicles, and of the inguinal and cervical glands, also in cutaneous affections, and diseases of the fibrous or osseous systems which are of syphilitic origin. M. Cullerier thinks the effects of the iodide of potassium are less prompt than those of mercury, and hence when the stomach bears it well, it requires a longer employ. He exhibits one grain of iodine with from two to four of the iodide of potassium dissolved in one ounce of water, and given at intervals in any convenient vehicle during the day. He does not increase the quantity of iodine beyond two grains in the day, nor that of the iodide of potassium beyond ten.

The most complete account of the mode of administration of the iodide of potassium and its effect on different forms of constitutional syphilis is that given, from the results and experiments made by Ricord, in the Gazette des Hôpitaux, for March 19, 1839. M. Ricord employs the iodide of potassium in gradually increasing doses, commencing with ten grains dissolved in three ounces of distilled water, and given at intervals during the day in any convenient vehicle. This quantity may be increased or diminished according to the effects produced; when the remedy agrees, which it most commonly does if the stomach be healthy, the dose is increased ten grains every two or three days till it is carried to a drachm, a drachm and a half, or even more, in the course of the day. The iodide of potassium, in full doses, occa-
sions a sensation of warmth in the stomach, improves the appetite, accelerates digestion, and quickens the pulse; a common and almost constant effect is a great increase in the secretion of urine. Sometimes it produces a ringing in the ears, a slight pustular eruption or diarrhoea. When these occur the dose must be diminished or the remedy abandoned altogether for a few days, till these symptoms have passed away: its use is then to be recommenced in smaller doses than before. In the great number of patients who have been treated by M. Ricord, the beneficial effects of the iodide of potassium have been constant, but not produced with equal rapidity. In this respect there has been considerable variation. We do not agree with Mr. Mayo, that "no medicine, where it does good, produces amendment so speedily as the iodide of potassium."

M. Ricord mentions the syphilitic deep-seated tubercle as the first disease in which he has extensively tried the iodide with success. The original seat of these tubercles, Mr. Babington says, is in some structure below the surface of the cutis, probably in the sebaceous glands. Ricord speaks merely of this disease as deep-seated tubercle; it belongs to his third order of parts, is prone to inflame and ulcerate, and terminate in the formation of foul, spreading, destructive sores. Before the tubercles have become inflamed or softened, whilst they are still indurated, M. Ricord has constantly succeeded in dispersing them by means of the iodide of potassium with small doses of the iodide of mercury. He employs the iodide of mercury in one grain doses, with three, four, or five of the ext. conii, and the iodide of potassium in gradually increasing doses. The mercury is rarely continued for a long period, and very commonly M. Ricord makes use of the iodide of potassium alone. When the tubercles have become ulcerated, M. Ricord still relies upon the iodide of potassium as his principal remedy. The local treatment, however, is of great importance, and must be directed under the views which would regulate us in the management of primary venereal sores.

M. Ricord thinks that mercury is generally inefficacious in the
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tertiary forms of syphilis. M. Biett has found in his extensive opportunities for observation, that mercury did not produce any marked effect over the syphilitic tubercula. He mentions some cases treated successfully by the arseniate of soda. Mr. Mayo alludes to a case in which mercury was given without any benefit. Mr. Parker's work contains an account of the local remedies to be employed in the ulcerating forms of the "tubercula." From the extensive trials made by Ricord, no remedy appears to have been so generally useful as the iodide of potassium.

The tubercular forms of syphilis commonly occur in conjunction with very considerable disorder of the general health, and it is scarcely necessary to notice again the stress laid by all the authors before us on the propriety and indeed absolute necessity of attending to this before any specific treatment is adopted. On this point M. Ricord has some admirable remarks. When the secondary forms of constitutional syphilis occur without complication in a good constitution not previously impaired by other diseases or weakened by improper treatment, a specific treatment may be at once adopted, and the cure is commonly easy and quick. When constitutional syphilis is complicated, the complications should never be neglected; if it occur in conjunction with acute affections, the treatment of the latter ought to be our first care, with the view of reducing the venereal affection to the simplest form possible. If chronic diseases, as those of the skin or the viscera, are found in connexion with it, the syphilis should first be treated, taking care that the special treatment of the latter be so framed that the concomitant disease, of whatever character it may be, is not aggravated by it. "Exclusive treatments," says M. Ricord, "to whatever doctrine they belong, are the least likely to succeed."

Amongst other forms of disease more particularly benefited by the iodide of potassium, M. Ricord mentions nocturnal pains in the bones, and diseases of the bones and periosteum. With respect to the former, when they have been fugitive they have generally yielded to the iodide: when localized for a longer or shorter period, this remedy, in conjunction with blisters over the
affected parts, has most commonly succeeded. M. Ricord believes nocturnal pains in the bones to result from a true inflammation of the osseous tissue, from syphilitic taint, and hence he considers these pains as the first symptoms by which such disease is characterized. These pains are commonly attributed to the prolonged or excessive use of mercury, but M. Ricord frequently meets with cases of diseases of the bones and periosteum in various stages at the venereal hospital in patients who have not taken a grain of mercury, and who have had chancre as a regular antecedent of the disease. Here, as in syphilitic caries, M. Ricord relies chiefly upon the iodide of potassium; he believes that mercury is generally injurious, at least he has abandoned its use, and succeeds better with the iodide. The iodide of potassium merits, in M. Ricord's view of its properties, in the treatment of the tertiary forms of syphilis, all the confidence that mercury has obtained in the treatment of the secondary, to which forms M. Ricord considers the iodides of mercury are particularly adapted.

We have not space enough to follow M. Cullerier through the various details of his practice. The work contains many valuable observations, and generally it may be said to advocate a mixed or modified mercurial treatment.

Mode of treating bubo.

As in what has been hitherto noticed in the authors under review, we have not said any thing of bubo, we shall take this opportunity of mentioning M. Lucas Championnière's account, given in the volume before us, of the plan adopted in the venereal hospital of treating buboes with blisters and a strong solution of the bichloride of mercury. This plan, originally proposed by M. Malapert, a French army-surgeon, consists in applying a small blister over the centre of the tumour, the next day removing the epidermis which has been raised by the blister, and applying a small compress over the denuded surface, soaked in a solution of the bichloride of mercury in the proportion of twenty grains to the ounce, this compress is kept in place by straps for two hours and is then removed; at this period an eschar involving the skin to a greater or less depth is formed, which on separating leaves
the bubo very much diminished in size, and is generally followed by its total disappearance. After the eschar has been formed, the swelling may be covered with a cold lotion or poultice. This plan of dispersing a venereal bubo has now the sanction of very great experience, drawn from its successful employment in the French army, and for seven years in the great Civil Venereal Hospital under the direction of Cullerier and Ricord. Cullerier speaks in very positive terms of this remedy from his own observations of its utility, and it remains for us merely to indicate those circumstances in which it is most likely to succeed. It is well known that the sympathetic bubo, succeeding to gonorrhoea, is not so prone to suppurate as the following chancre, and here M. Ricord prefers attempts at dispersion, to be made first by pressure with the ammoniacum and mercury plaster; if these do not quickly accomplish their object, or the tumour tend to increase, the blister with caustic is used. In all forms of the venereal bubo, except where matter has actually formed, or the surface is very much inflamed, it may be employed. Resorted to early in the disease, Cullerier states that he does not recollect seeing it fail in producing a total dispersion of the tumour.

[However much the Editor might wish to condense the materials hitherto furnished, the work would be incomplete were he to omit the following very excellent paper in the Guy's Hospital Reports, by C. A. Key, Esq., the Senior Surgeon to that noble institution.]

I select, for the present paper, cases of primary venereal sores, in men admitted into the Samaritan Ward, under my care, since the year 1825. They are classed under the following heads, according to the character of the sore and other circumstances connected with the case. To avoid, as far as possible, confusion, by the introduction of new names and new divisions,—a proceeding that more often tends to obscure than to elucidate the matter,—I adhere pretty closely to the received nomenclature of venereal
sores: and as the term chancre is understood, by all, to be a sore produced by venereal infection, I use it as applicable to all such sores, whatever character they may bear; distinguishing one class from another according as they exhibit more or less evidence of poisonous action, and also according to the character which the existing state of the constitution may impart to them. The limits of the paper render it necessary to make the report concise.

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<th>No.</th>
<th>Description</th>
<th>Frequency</th>
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<td>Aphthous chancre</td>
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<td>2.</td>
<td>Ditto, with bubo</td>
<td>58</td>
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<tr>
<td>3.</td>
<td>Ditto, with open bubo</td>
<td>41</td>
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<tr>
<td>4.</td>
<td>Ditto, with phymosis</td>
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</tr>
<tr>
<td>5.</td>
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<td>4</td>
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<tr>
<td>9.</td>
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<td>Ditto, with bubo</td>
<td>9</td>
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<td>11.</td>
<td>Ditto, with phymosis</td>
<td>4</td>
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<td>12.</td>
<td>Phymosis with chancre at extremity of prepuce</td>
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<td>Irritable chancre of inner prepuce and glans</td>
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<td>Ditto of glans and inner prepuce</td>
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<td>Ditto, with phymosis</td>
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<td>17</td>
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<tr>
<td>23.</td>
<td>Phagedenic bubo</td>
<td>8</td>
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<tr>
<td>24.</td>
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<td>13</td>
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<td>25.</td>
<td>Ditto, with sloughing of prepuce and glans</td>
<td>2</td>
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<td>26.</td>
<td>Ditto, with ulceration of prepuce</td>
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<td>27.</td>
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Ditto, with phymosis and sloughing prepuce . . . . . . . 2
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The name employed to designate chancres that are remarkable for their negative rather than their positive qualities, serves well enough to express this kind of sore. It is rare to find a sore wholly devoid of the thickened base, as the word "aphthous" might lead us to suppose; but the bursting of the vesicle or pustule sometimes leaves a sore presenting to the eye appearances so like those of an aphthous sore in the mouth, as well may excuse the appellation being retained. The nature of a chancre, I apprehend, will depend on the depth to which the action of the poison penetrates. In this form, its action seems to be confined to the surface of the cutis; blistering, as it were, the epithelium, without indurating the surrounding tissue; and such a sore will often quickly heal; leaving the practitioner in doubt as to its real nature, because it wants what, in his view, is a claim to the name of chancre. When it is more tardy in healing, and its stages of ulceration, granulation, and cicatrization are more distinct and protracted in their course, the poison usually affects the parts to a greater depth, and what was at first a simple vesicle leaves a sore with a thickened base, as if the cutis and cellular tissue had become more imbued with the poison.

It appears to me, as far as my observation has gone, that the aphthous sore will thus often run into the more fully developed chancre; and that it is impossible to predict that a sore, at first aphthous in appearance, shall heal quickly, and shall not put on the more decided character of venereal action: or it will sometimes heal, leaving behind a very slight induration, and again break out into a virulent sore, exhibiting the indurated form of venereal ulceration.
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Aphthous sore. It may, however, be truly said, that this sore presents the least sign of a poisonous action, whether we look to the thickening of the base of the sore and its edge, or to the nature of the secretion and the appearance of the sore. And we are, therefore, warranted in the inference, that either it is the result of a peculiar poison mild in its nature, or caused by a virus common to all venereal sores, but exhibiting its action in its mildest form. This question leads at once to the much-debated one of a diversity of poisons; which, in spite of all that has been urged in defence of and against the doctrine, must remain in abeyance, until experiments, conducted on a large scale, by persons qualified for the purpose, shall have brought together an irresistible mass of evidence. Though the truth, in matters of science, cannot but be important and useful, the mere question, whether a variety of effects arise from one or from many causes, appears to me not to possess that importance which has been attached to it. And in saying this, I would not be thought to undervalue Mr. Carmichael's laborious services: for to him the profession owes much, as the first who successfully discriminated between the different forms of the disease, and grouped them with the hand of a master. If we admit that each group exists as this surgeon has depicted them, how does it advance us, to know that each has its peculiar poison? A virus is only known by its effects; and if it is established, by sufficient testimony, that certain symptoms for the most part concur in individual cases, even though the exceptions may be numerous, all is proved that is required for the guidance of the practitioner.

When repeated experiments have proved that gonorrhœa, and every variety of primary sore, can be produced by inoculation with the same poison, I shall give in my adhesion to the doctrine of one venereal poison:

In the present state of our knowledge, the only well-grounded mode of proceeding is, to describe and distinguish sores according to their characters; as has been ably done by later writers—Carmichael, Bacon, Evans, Wallace, and others; of whom, a practitioner will take one or the other for his guide, as he finds their de-
scription confirmed by his own experience. My feeling, in regard to this matter is, that the line attempted to be drawn between the different kinds of sores is too defined, inasmuch as nature points out no such lines of demarcation. Each sore is found, occasionally, to run imperceptibly into another class; so that it is difficult to decide to which it belongs. The aphthous sore, in its extreme form, has scarcely hardness of base or edge; but sometimes it has a slightly elevated edge, and consequently a deeper centre, as in the sore fringing the prepuce; and occasionally a rugged surface with a somewhat hardened base, as at the corona glandis: an elevated surface, and firm base, as is often seen in a chronic sore on the prepuce.

It will be observed, that a large number in the catalogue of primary sores is classed under this head. The list includes not only the aphthous sores, in the strictest limitation of the term, but all those variations which I consider properly to come under this class—varieties depending on causes that I will briefly point out.

The hardness surrounding a venereal sore, on which so much stress is laid by most writers, as characteristic of and almost proportionate to the degree of virulence of the poison, has been looked upon, by many, as indicative of the presence of the venereal poison; and, when absent, to decide the non-syphilitic nature of a sore. Surgeons of the present day do not, perhaps, carry their views of induration so far as this; but it is usually supposed, that the greater the degree of induration the more decided is the syphilitic character; and Mr. Hunter is appealed to as authority for such opinion. But, in his work on the lues, he does not lay down any such exclusive rule: he says, "A chancre has commonly a thickened base; and although the common inflammation spreads much further, yet the specific inflammation is confined to this base." In speaking of a chancre on the body of the penis, he omits the characteristic hardness altogether, describing it as "a pimple that is allowed to scab, owing to its being exposed to evaporation: this scab is rubbed off, or pushed off, and one larger than the first forms." Again: "A chancre on the glands," he says,
Aphthous sore. "appears as a pimple full of matter, without much hardness." We cannot, then, cite Mr. Hunter's authority in favour of the once prevailing, but now declining opinion, that a true chancre is uniformly attended with a cartilaginous hardness. With his usual acumen, he had observed, and has not failed to describe, the variety in the characters of syphilitic sores. The above quotation describes one cause of this variety to be the situation of the sore.

The site of an aphthous chancre (but stating this may be considered as begging the question of identity) greatly modifies its condition and progress. It penetrates at one time only through the surface of the epithelium; and forms, on the glans or inner prepuce, a superficial sore, that often heals with one or two applications of the nitrate of silver, as a common vesicle would; the extent of poisoned tissue being so superficial as to be within the reach of this mild caustic. At the corona glandis, on the other hand, there is glandular structure and cellular tissue; and then we find this kind of chancre almost always firm at its base, deep in its action, and ragged, instead of being smooth on its surface. Over this sore the nitrate of silver has less influence, because it does not penetrate deep enough to reach the extent of the poisoned structure; and in such a case, when applied, it acts on a different principle. A chancre may be at first of the simplest kind, so as scarcely to be recognised as one: if touched with caustic, it may heal. If it breaks out again, it will sometimes evince more decided characters; and shew a raised edge, and have a more firm base: or, if it begins as an aphthous sore, and is prevented healing, by friction, or want of careful dressing, it begins to acquire, as the scab is successively pushed off, different characters; and in a week or two, presents, in all respects, the most marked effects of the action of the poison. If nitrate of silver be applied to the sore in excess, the inflammation that follows, will sometimes increase the thickness of its base, and seem to increase, as it is considered, the syphilitic character. The hardness of base and edge is usually greater in proportion to the duration of the ulcer, and by no means indicates a greater intensity of poison; for the most
indurated sores that I have seen, of five and six months' standing from neglect, have been accompanied with a cartilaginous hardness; and yet in no other respect (as the kind of secretion, appearance of the sore, disposition to spread, intractability, or the character of the secondary symptoms) has it exceeded the mildest aphpitous chancre. Sores at the end of the preputial fold, fringing the prepuce, and occasioning partial or complete phymosis, are usually remarkable for their hard base and elevated edge, and yet not possessing the other characters of a poisoned ulcer, yield to the simplest mercurial treatment: these are exposed to friction, are not easily protected by dressings, and occupy a part where cellular tissue abounds. It does then appear to me, that induration, though usually attending a chancre when seated in some tissues, cannot, when absent or present, negative or decide the action of the virus.

The circumstances that more especially stamp the syphilitic character are, the character of the secretion, and the aspect of the sore in its different stages—points of diagnosis that appeal only to the eye for recognition, and therefore not easily communicated by description. The stages of a chancre have been so well and so minutely described by various writers, as to make it difficult to follow the description, and almost hopeless, as well as useless, to attempt any addition. The vesicular, ulcerative, granulating, and cicatrizing stages have been rendered so clear, and so familiar, that I should only repeat what is known, were I to say any thing on these points. In arranging and dividing the seats and forms of disease at the beginning of this paper, I have adhered to the generally received opinions on this subject. The best writers, beginning with Mr. Carmichael, who led the way in drawing a distinction between syphilitic sores, have endeavoured to establish a line of demarcation between each class, by taking a specific appearance as characteristic of each. When I first began to study syphilis, I had Mr. Carmichael's excellent work as my text-book. His classification of primary sores threw so much light on the causes of their various appearances—which pseudo-syphilitic doc-
trines had, to my poor judgment, involved in much obscurity—that I divided the subject according to his views. A difficulty, however, soon arose—into which class certain sores ought to fall; partaking, as they often did, of characters of two classes, and yet wanting some of each. The simple primary sore would come so near to the description of the raised ulcer, that I could scarcely tell to which class it belonged. More extended observation at length taught me, that the line of distinction was arbitrary; and that to adhere strictly to the division of this excellent and ingenious surgeon, however one may estimate the correctness of his description, would be to draw lines that had not been drawn by the hand of nature.

When opportunities of observing these sores on a more extended scale had offered themselves, I found that the sores which might be termed syphilitic, inasmuch as they caused secondary symptoms, passed imperceptibly from one class into another. These aphthous sores I found continually to lose a part of their negative character, and to approach, in hardness of bone and edge, and appearance of surface, to the raised chancre of the prepuce, and also frequently to acquire some of the character of the indurated chancre; so that I experienced much difficulty in deciding to which order of sores they belonged. The indurated chancre of Hunter, as it is termed, would sometimes be defective in the ulcerating stage; having on its surface little more than an excoriation, covering the indurated mass, or sometimes even having an unbroken surface.

Finding that chancrees possessed every variety and shade of character, I came to the conclusion, either that it must be occasioned by the difference of situation which it occupied on the penis, or by a varied action or intensity of the poison, or by a peculiarity of constitution. The former position, as offering a satisfactory explanation, is wholly untenable; for though situation must be allowed greatly to modify, in some respects, the appearance of sores, yet, as every variety of sore occasionally appears in the same part, it is obvious that some other cause
must be in operation. To follow Mr. Carmichael's ingenious doctrine, of a separate poison producing each variety of sore, would be to introduce an almost endless variety of poisons; and if the line of demarcation between classes of sores be not so clear and defined as Mr. Carmichael describes them, and one class runs insensibly into its neighbour, it follows that the poisons producing them must possess but slight shades of distinction, and must, like the sores which they produce, closely resemble each other in the middle of the chain, while at the extreme points their difference must be considerable. At first, it appears inconsistent with the definite progress of disease arising from one poison, that in one person a chancre should be an excavated sore, and in another, an induration of tissue with scarcely a breach of surface. We see, however, in other diseases, a similar variety of action from the same cause. In cancer of the lower lip, the disorder begins often with an excoriated surface, encrusted with a scab, rising at length into a fungus with everted edges; then degenerating into an ulcer with a deep centre and raised margin, and at last presenting a foul phagedænic sore; this is an instance of the same action being (so far as a cause is in operation) productive of dissimilar effects, and bears a close analogy to the diversity of sores produced by the syphilitic poison. The explanation of the variety in the instance of cancer, lies in the accidental state of the powers of the constitution, and their ability to resist the disorganizing tendency of disease; if great, ceteris paribus, a fungous action ensues; if small, ulceration is the result.

This view of the matter differs but little from that of Mr. Carmichael. This slight difference, however, seems essential to a true understanding of the matter. I am far from wishing to derogate from Mr. Carmichael's claims to originality or usefulness, in the views that he has so well advocated. Entertaining, as I do, the opinion, founded on a pretty long course of observation, that venereal sores run one into the other, and are not separated by lines so defined as have been marked out for their distinction, it
is impossible to admit more than a modification of poison. A modification may be considered equivalent to a difference of poison; perhaps it is.

The signs of the action of syphilitic poison I take to be those that are most fully developed in sores which, by common consent, are regarded as chancre, whose characters are not doubtful; and the consequence of which, if left to themselves, is, according to my experience, the occurrence of secondary symptoms. The induration on which such stress is laid, is a usual, not a constant or essential concomitant; though some degree of thickening usually attends a chancre. On this, therefore, when other signs can be obtained, I should be inclined to place less reliance than many are disposed to do; its absence certainly should not be regarded as evidence of that of all venereal taint, when other characters attest the presence of a poison. The early formation of a chancre varies in appearance, and cannot alone form a test; usually, it is vesicular, with slight excavation; sometimes there is no excavation at all in the cutis, which appears entire and level when the cuticle is removed. Sometimes induration commences with the formation of the vesicle, or even precedes it; and occasionally induration exists without vesicle or ulceration. The more mild, however, the action of the poison, both in its primary and secondary form, the more simple is the vesicle in its early stage, possessing a scarcely perceptible induration. The more intense the action of the poison, the more does the secretion differ from ordinary pus. It is of a reddish brown colour; gluey or tenacious in consistence, and semitranslucent. As the ulcerative stage ceases, this secretion gradually becomes denser and more opaque; but still retains its dark appearance, even when solidified in the first stage of granulation. When ulceration has ceased, the poisonous action still continuing, the sore is seen covered with a light-brown layer of adhesive matter, not unaptly (as it has been) compared to chamois leather. In the milder forms of sores, the secretion approaches more to the appearance of common pus, more yellowish in colour, and less
tenacious; and the firm deposit that succeeds the ulcerative stage, resembles more the coagulable lymph of a common ulcer. These distinctions are gradually losing themselves as the sores more resemble the aphthous ulcer; so that the secretion of some differs so little from an ordinary opaque vesicle or pustule, as to lead to the opinion that they are free from poisonous qualities. The nature of the secretion can be best observed when the sore scabs over on the outer skin of the penis, or when the nitrate of silver, failing to arrest the secretion, forms a crust over a dépôt. All shades of character are to be seen in keeping with the other signs of virulent action, more or less determined according to its intensity. Mr. Evans has been led to believe that the activity of the disease depends on the stage or period at which the poison is communicated; if this be so—a position that would require a series of well conducted experiments to verify—it is only necessary to extend the principle, to explain all the various degrees in which the disease is found to exist.

The change which the sore undergoes, in its transition from the stage of ulceration to that of granulation, also presents characters sufficiently peculiar, to distinguish it easily from an ordinary ulcer. Usually, the only appearance to be observed in a common sore is, that the surface, which had been the seat of active ulceration, is gradually covered with granulations, that become more and more defined, assume, as they form, a healthy character. The process by which they are formed is hardly to be observed; but in a syphilitic sore, a distinct adhesive stage is to be seen preceding that of granulation, which, in a common sore, can only be observed under an accidental attack of inflammation. If a chancre proceed ever so favourably towards cicatrization, unless mercury be employed to destroy its venereal character, the sore is usually seen covered with a yellow or brown layer of fibrin or buff, varying in colour according to the greater or less intensity of the action, and disappearing as the sore is more disposed to granulate. The granulations also possess a peculiarity
in the minuteness as well as distinctness of their points, the great regularity of surface, and elevation of the granulating mass above the level of the surrounding skin; this latter feature is owing, possibly, to the induration of the base of the sore not having subsided before granulations are formed. The granulating stage is sometimes remarkable for its irregular action; the edge and several parts of the surface becoming prominent, and dark-coloured or venous in appearance, presenting a livid and rugged aspect. This is more usually the case in sores that have been disposed to slough, but in which the specific action has not been destroyed by the sloughing process, but becomes developed as the granulating action sets in. In the cicatrization of the sore, there is little or no difference perceptible from that process, as it takes place in common sores.

Chancres evincing the greatest intensity of poisonous action are more frequently seen on the outer prepuce than on other parts of the organ; while the milder kinds are found on the thin covering of the glans, inner prepuce, and corona; the latter being covered with a finer cutis, and therefore more susceptible of the action of a milder poison; while the dense common integument of the body of the penis, resisting the action of the milder forms of virus, are acted on only by the more active causes of infection. Hence, on the body of the penis every stage of a chancre can be then more fully developed, and its characters, in its different stages, more satisfactorily observed. Another reason for this may be, that sores on the integuments are less noticed by patients; or not regarded as chancres, but as excoriations; and therefore have the early part of their career undisturbed by dressings, and unchanged by mercury. The mild forms of sores that are seen fringing the extremity of the prepuce, and causing phymosis, are exceptions to the usual sores found on the skin of the penis; they are mild in their nature, often not followed by absorption or secondary symptoms; and when these do appear, they are of an unimportant kind. These sores are produced by
the mild secretion lodging upon the end of the prepuce for a considerable time, and making up, by continued application, what it wants in intensity.

The early stages of chancre are rarely seen in hospital practice. Patients are not admitted, or do not apply, till some abnormal change has taken place in the sore, or some difficulty has arisen in healing it. The class of sores seen in the wards are, therefore, different from those seen by the private practitioner, who alone can study the early phases of chancre, and learn what treatment is best adapted to them.

In the majority of cases of common vesicular chancre, the nitrate of silver is the best application. In the opinion of its advantages, as detailed by Dr. Wallace and others, I fully concur. When used properly, and under circumstances which ought not, in the eye of an ordinarily judicious practitioner, to forbid its employment, it altogether destroys the seat of the syphilitic virus, and thus prevents infection, both local and constitutional. Such an effect can only be looked for when the vesicle is seen in its commencement. If the action is not wholly arrested, an eschar is formed, which serves to protect the surface, and limit its extension. Most commonly, the ulceration extends; but is still benefited by this application, more than by milder astringents. When used as an astringent, in healing the sore, it should be applied more lightly than when employed for its escharotic action: for this purpose, the surface should be brushed with the caustic, and reapplied as often as the eschar peels off. Even in the granulating stage of a chancre, I often employ it, where common dressings are inconvenient, or likely to be improperly or carelessly made. The solid sulphate of copper is a good substitute for the nitrate of silver, when the latter excites too much action. Mercurial applications seem, in the early stages, to be peculiarly noxious, as if the action were rather increased than stayed by them; the secretion being rendered more copious, and ulceration more inclined to spread. Mercurial washes or ointments, in the ulcerated stage, I employ, not as a general rule, but as the exception in sores indo-
lent, not sensitive, and secreting but sparingly. In the larger number of sores, mercurial applications are hardly admissible in our list of remedies: the common astringent salts—as the preparations of silver, lead, zinc, and copper—varied as the state of the sore will bear, check the disposition to spread quickly, and bring on an appearance of granulation. To the premature use of mercurial dressings, much of the troublesome career of their sores may be attributed: their injurious action is seen in the conversion of the surface into a yellowish mass, a change that usually indicates ulceration, an increase of secretion, a disposition to spread, and an increased degree of sensibility: and as soon as these applications are replaced by astringents, the changes in the appearances of the sore shew on what its previous condition depended. The same remark will not have escaped the notice of the experienced surgeon, in the influence of mercury, internally administered, on these sores: and while they remain in the ulcerative stage, it should be sparingly given, and cautiously watched. Its beneficial effect, in lessening the thickened base of a chancre, cannot be doubted; but while it does this, it often acts injuriously on the surface, and gives to the sore a character approaching the phagedænic. Much of this evil may be obviated, by combining the internal action of mercury with local astringents, and increasing the quantity of mercury according as the sore seems disposed to granulate. When the granulating action is once established, the mercurial may then be increased with safety and with efficacy, and carried on until cicatrisation is complete. The diminution of mercurial action, as the stage of granulation proceeds, under the impression that the virus is destroyed, leaves an induration, after the sore is healed, difficult to remove, and forming a nidus of future mischief. As the inclination in the sore to spread ceases, and the surface becomes more disposed to granulate, I usually increase the quantity of mercury; as the sore now bears it better, and a greater security is gained against a re-appearance of the disease. I cannot do better than quote the words of Mr. Hunter: "It should be given during the whole time of the cure,
(that is, as soon as its curative action can be brought to bear,) and continued for some time after the chancre is healed. The quantity given should be such as may, in common, affect the mouth slightly." I do not, in this advice, see any recommendation of the proposed salivation to which Mr. Hunter is said to be inclined; nor do I see much in which it differs from the modern method of those who see much venereal practice.

In sores whose syphilitic character is not equivocal, even during the ulcerative stage, mercurial applications are found not to disagree. If the sore be bounded by a thick and firm margin, which is raised and prominent, presenting, at its outer edge, a raised granulating boundary, while the inner edge is slowly ulcerating, and thus enlarging and perhaps deepening the sore, mercurial washes—either the chloride with lime-water, or the bichloride dissolved in water—act well, in retarding the ulcerating process. In the aphthous chancre, the disposition to spread is often remarkable: it is a sort of irritable temperament, and requires much caution, and more common, than specific treatment. But in the more decided chancre, the disposition to be "set astray" is less; and the syphilitic characters being more developed, mercurial application agrees better with them, and may be applied with less apprehension of the ulceration extending. In these sores, local mercurial action does not render the secretion copious; nor does it render the surface yellow, loose, and spongy, or the edge disposed to break up, as it does in the aphthous sore: on the contrary, the edge becomes less raised and firm, but not disposed to extend by ulceration; the secretion is altered, but not increased; the surface becomes more solid and fibrinous, and inclined to granulate. If they present not the most decided characters, but verge towards the aphthous ulcer, a combination of the two plans may be had recourse to: an astringent may be used, for the purpose of protecting the sore from the injurious effects of mercurial action, while the sore is still receiving the benefit of that action: thus, it may be dressed with the black wash, and washed with a pretty strong solution of some of the salts alluded to. The tone and
vigour of the tissue are preserved by the astringent, while the mercurial corrects the morbid action induced by the virus.

In the treatment of primary sores, I commence with mercurial medicines as soon as the preceding indications shew the sore needs them, and carry them to the extent that the patient's constitution is able to bear. The principles by which the practitioner should be guided, in deciding on this difficult point, are those of general pathology. The remedial agency of mercury, in arresting the action of the syphilitic virus, is known to all, and acknowledged by all who study the course of this disease and the action of this medicine; but the numerous conditions that interfere with its action as a remedy, and tend to convert it into a poison, are less known, because they are more difficult to appreciate. I know of no rules that can be laid down for the guidance of the practitioner, except such as are so general, that they can hardly serve as rules: they are rather principles than rules; and where the straight line of action afforded by a rule fails—as in this, and indeed every other disease, it occasionally does—principle comes to our aid, as a never-failing guide. In the employment of mercury, its power of exciting the irritability of all the actions of the body is to be borne in view, and jealously watched. Its action on the heart and nervous systems, and, through them, on the functions of all the organs of the body both nutrient and reparative, (for no organ is withheld from its influence,) is to be carefully noted; lest, while it quickens all the organic actions, their energy and strength are not exhausted in proportion to the increase of their irritability. Every individual is affected by this remedy, in a manner peculiar to himself; nor is it easy to foresee how it will act on any individual constitution.

In primary syphilis, an index fortunately exists, by which the injurious action of mercury is at once perceived: this is, the sore; a more delicate test cannot be desired: often, before any feeling of the patient, or any of his functions, shew a sign of disturbance, the sore evinces a wayward disposition, that calls for a discontinuance of the remedy; and though opium, combined
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with it, may lessen the irritability of the system, and dispose the sore to bear it, the idiosyncrasy of constitution is often such as to preclude the possibility of employing it, even in the smallest doses, without the risk of establishing an ulcerative action, attended with extreme irritability.

The sores that are attended with induration, as a distinguishing feature, are of three kinds. They form the opposite end of the chain to the aphthous ulcer; the various grades of chancre last alluded to constituting the intermediate links of junction. They are remarkable for their indolent character, and for possessing a hardness, from which the aphthous sore in some forms is quite free.

Of these, that which is most commonly met with in practice is the sore familiarly known as the Hunterian chancre; which appears as an ulcer with an excavated centre, a mass of indurated tissue surrounding the sore on all sides, and an edge raised and slightly everted. These are, or rather are said to be, the tests of what Mr. Hunter considers a true chancre. Those who think so, I refer to Mr. Hunter's writings, with the recommendation, not to form an opinion from one or two expressions, but, from a fair and careful comparison of his remarks, to gather his full meaning. It is not my object here to rescue Mr. Hunter from the errors imputed to him,—that has been recently done by his commentators; but I would not seem to state an opinion opposed to that of so great a pathologist. I feel satisfied that Mr. Hunter would not have measured venereal sores by the degree or extent of induration. So acute an observer must have known, that many sores possessed of the greatest hardness are often greatly deficient in all the other signs of syphilitic action, in the nature of the secretion, in the aspect of the granulations, and in the entire absence of contamination of the inguinal glands, and constitution. The last instance that I have seen of this form of sore, occurred in a man about thirty-five years old, florid in complexion, and temperate in his habits. It appeared at the corona, as a common aphthous sore; which gradually spread, and ate its way deep, but slowly, between the glans and corpus cavernosum. When I saw it, its
size was that of a large sixpence; and it felt like cartilage under
the finger. Neither its secretion nor surface were those of a
venereal sore; nor has any form of secondary infection made its
appearance, although it has existed between four and five months.
It healed quickly under a small dose of blue pill at night, and with
a rapid diminution of the hardness. When combined with the
other evidences of poison, induration is of some value, in deter-
mining the nature of a sore; but alone, it is indecisive of the
poisonous character of an ulcer, especially when seated in the
cellular membrane, deep beneath the cutis. Sores are occasionally
met with, where the induration amounts to a cartilaginous hard-
ness, that possess scarcely a trace of virus, having acquired the
hardness by time and place. The deep chronic chancre of the
corona glandis, mild in its character, and usually harmless in its
effects, will last for months, and acquire a degree of induration
that gladdens the heart of a soi-disant disciple of Hunter, grieved
to find the good old chancre fast disappearing from the land.
This form of indurated sore is hardly to be classed with the two
following; as its negative characters, with the exception of indu-
ration, coincide with the mild aphthous sore.

Among the chancrees that claim the appellation of "indurated"
are such as commence with a thickening of the cutis, or subjacent
cellular tissue. Of these I have notes of two kinds, occurring
oftener in private than in hospital cases. One begins with a red-
ness and tenderness of the inner prepuce or corona; and the
patient, feeling something wrong, looks for an excoriation, but dis-
covers only a slight tumefaction, without breach of surface. If the
red part, which is usually somewhat more diffused than in an ordi-
nary character, be pinched up, the whole tissue feels harder than
common, and very circumscribed. If neglected, as it commonly is,
from the supposition of its harmless nature, these appearances in-
crease, until the skin becomes glossy, and at length excoriated.
The appearance of the excoriated part is highly florid and promi-
nent, and a minute quantity of secretion can be seen oozing from
it: there is not any appearance of ulceration. The vesicular and
ulcerative stages are also wanting; the virus at once irritates the
substance of the cutis into action; it swells, and becomes firm under the irritation, and throws off its cuticle without the intervening process of vesication. Such a sore is always followed, so far as my experience has gone, by absorption, and a train of secondary symptoms.

In the treatment, two circumstances force themselves on the attention of the surgeon,—the inability of the sore to bear mercurial applications, and the necessity of giving mercury in a cautious manner. Common mercurial dressings, lotions, or ointments, produce a painful degree of erythema, that soon renders it necessary to drop them, and to employ some mild lead astringent with opium, to soothe the irritability of the part: warm-water dressing is as good as any other; a few leeches on the body of the penis, if the pain be great, and the constitution shew signs of disturbance. Mercury should be used at once; but given at first to tranquillize, and therefore with some form of opium, as calomel and Dover’s powder; and I prescribe the same in the day-time, as disposing the patient to bear better the action of mercury. Desirable as it is to get the patient as soon as possible under the influence of mercury, too much care cannot be taken to watch its action: for though the sore may require it, the patient’s constitution will sometimes become irritable under it; and the secondary symptoms of the disease are certain to exhibit the evil effects of this remedy, should its action have been carried on injudiciously, in the treatment of the primary sore. The form of medicine, therefore, should be such as will be least likely to increase the constitutional irritability of the patient, and effective enough to induce a curative action. From whatever cause it may be, the character of the secondary symptoms following this sore is usually severe, even when the constitution has not been influenced by mercury; and therefore much circumspection is required, not to exceed the bounds of prudence, in its administration. When prudently given, its beneficial influences will be evident; as its action will leave behind most mischievous effects, if it be indiscreetly employed.

The other kind of induration resembles, in many respects, the
Milder form of induration. The virus neither excoriates nor ulcerates the skin; but the first intimation the patient has of infection is a remarkable induration of the under layer of the cutis, extending into the surrounding cellular membrane, forming a lump beneath the skin, from which it seems to grow. It gives but little uneasiness, even when pressed; and scarcely raises in his mind a suspicion of venereal infection. The points of difference from the former sore are, the entire freedom from inflammation and consequent excoriation or ulceration; the action being of the most chronic kind. The cause of this difference seems to reside more in the natural constitution of the patient, and his accidental condition at the time of infection, than on any essential difference in the virus. The obedience of the action to mercury, and the similarity of secondary symptoms, though they are usually of a less severe kind, stamp the sores as of the same kind, only differing in intensity. There is here no impediment in the prompt administration of mercury till the gums are affected, and keeping up the action till the mass softens and subsides. The constitution is usually in a state to bear it; and unless it is given to the full extent to produce its specific effect, secondary effects will arise in the skin and throat. The length of time that usually is allowed to elapse between the period of infection and the commencement of remedies gives the opportunity of absorption; which, in all the instances that I have seen of this form of the disease, has invariably occurred in a marked degree. The freedom from irritation of the part also invites the application of a mercurial; and the mercurial ointment is the best that can be used.

In the management of venereal affections, it is a point of the first importance to distinguish between the essential characters of the unmixed effects of the poison, and those features which they acquire from accidental circumstances. In the treatment of chancre, this distinction cannot too forcibly engage the attention of the practitioner; as upon it will depend, in great measure, the correctness of the opinion formed, as to the propriety of employing mercury, or withholding it. There are few chancre, when the disease
takes, if it may be so expressed, its own course, undisturbed by external accidents or peculiarity of constitution, that will not bear this remedy with advantage: and, on the other hand, it may, I think, be safely and truly assumed as an axiom in practice, that when the character of a sore denotes the interference of an unusual action, by which it acquires a character foreign to the usual appearances of a sore under the influence of the virus, other remedies must be sought for, and employed in the place of mercury.

The next principle that ought to engage the attention of the surgeon, is the kind of action that has, to borrow a phrase of Mr. Carmichael, "set the sore astray." A knowledge of the true appearances of a venereal ulcer gives him a correct idea of the extent to which the virus may be acting, in any given sore: but it is necessary to do more than this, and to determine on what depends the deviation of a chancre from its ordinary character, as well as what means will best check its anormal course. These three considerations always bear their due share in the opinion that I form of a venereal primary sore: first, the extent to which the virus is in operation: secondly, how far irregular or anormal actions are wound up with the action of the poison, and the proportion that each bears in determining the nature of the sore; and, thirdly, what peculiarity of action it is that creates the anormal character. Those causes, as giving rise to the class of sores forming the latter part of the list at the commencement of this paper, will be next considered.

The first head includes those which are usually called irritable, and which I have termed the mild, phagedænic sore. Irritability is the main cause of sores becoming phagedænic, and is a state assumed by chancres that ultimately become phagedænic. A chancre may become irritable from a local cause, or from a morbid peculiarity of constitution natural to the patient, or induced by habits of life, and mercury.

The former of these causes is often seen in operation in chancres seated on the penis, or the extremity of the glans, near the opening
of the urethra. Such sores almost always are tardy in healing, from some untoward impediment. A fraenal chancre at first resembles sores in other parts, and is treated in the same way. It seems obedient to the remedies, and promises well. At length, it ceases to be benefited by the means employed: the sore becomes, as it is called, indolent, and stronger measures are employed: the sore becomes painful, and the surrounding skin and fraenum inflamed; and neither mercury within, nor stimulants without, are found to answer. If the ulcer does not spread, it becomes stationary, and is covered with minute red points of granulation, amid a yellow surface. Such is the common course of a chancre so situated, proceeding in this way, sometimes, for weeks; and unless principle be called to our aid; to explain the reason of its intractable state, applications are changed to but little purpose. The cause lies in an irritable kind of inflammation induced by local stimulants that disagree with the sore, and influence it and the surrounding tissue: neglect of the observance of a proper system of diet and regular hours, increase the inflammation, and produce an irritability of the nervous and circulating systems, which is increased often by the use of mercury. If mercury be withdrawn, or given in the smallest doses, with full doses of Dover's powder, to obtain rest—and, in the place of irritating applications, warm water, or lime-water and opium, be substituted—the tranquillity of the sore is soon obtained, the pulse of the patient soon shews the improvement of constitution, and the process of reparation begins. The nitrate of silver is often useful in this irritable sore, by keeping its surface unirritated and protected. The only remedy, in addition to purgation, that I employ, is the cold infusion of sarsaparilla in lime-water: its power in allaying irritability of action, local and general, is incontestable: it lessens the frequency of the heart's action, softens the quick beat of the pulse, and diminishes the irritability of brain, evinced in the eyes; and of the intestinal canal, as indicated by the tongue, of most patients. When the languor of debility is present, this form of sarsaparilla is of little use; it
is only when there is inordinate action, short of inflammation, that its benefits are distinctly seen; and not only in this, but in all forms of venereal sores accompanied by such conditions of irritability.

When seated on the extremity of the glans, and surrounding the urethra, the sore becomes irritable, and indisposed to heal under the continual irritation of urine, or if mercury be employed, it assumes at once a phagedænic disposition, and spreads rapidly. When irritable, it usually extends as far as the influence of the urine reaches, generally to about the size of a half sovereign. It spreads slowly, making every now and then an abortive attempt to granulate; which ends in covering the surface, not with fibrine, but with a soft yellowish coating. The ulcer generally presents this projecting yellow sloughing surface,—arising, as I conceive, from the deposit not having tenacity or firmness enough to form the material for future granulations; but gradually softening down, and passing into the state of ulceration. In all sores of this description, maintained in their anormal state by local causes, longer time must be allowed for their passing through their different stages. If the same active mercurial treatment be adopted, in the hope of speedily correcting the action, the surgeon is disappointed; and the mercurial action induced, is converted into one of irritation, as respects the ulcer. The only course he has to pursue, is, to act on the defensive, and to watch the appearances of the sore. If the sore is mild in its anormal deviation, and mercury, in small doses, seems admissible, it should be combined with sarsa, or quinine, or opium, with the view of lessening its irritating effects. Mercury, however, in any form, is rarely admissible: it is better to begin, as soon as this disposition is observed in the sore, with the application of a solution of nitrate of silver,—from three to six grains to the ounce, as can best be borne; and to continue it as long as the coating of the ulcer is indisposed to become firm in texture. As soon as the whitish slough becomes firmer in consistence, it shews that the disposition to ulceration on the surface is on the decline; and in this state it will bear a weak solution of mercury, occasionally applied, at first as a lotion, and afterwards as a continued
dressing. A grain of the bichloride, dissolved in an ounce and a half of water, with the addition of three or four minims of the hydrochloric acid, forms a good lotion; and, alternated with the astringent already mentioned, or with one of the metallic sulphates, will be found to correct the sore as soon as any application that can be used. Smearing the sore with oil, at each time of micturition, protects it from the contact of urine, and is not to be neglected.

Mr. Hunter has much laid to his charge, of which he is wholly innocent. The excessive and indiscriminate use of mercury, in all sores thought to be syphilitic, as recommended and practised by surgeons educated in the school of Hunter, had no authority in the precepts of that great master of our art. Observations of the same tendency as the following are dispersed throughout his work, and shew how familiar he was with the tendency of sores to assume an irregular character, depending on some peculiarity of constitution at the time of infection. "The immediate or local effects of the venereal disease," he observes, "are seldom wholly specific; but they partake of the constitutional and specific inflammation; and therefore it is very necessary to pay some attention to the manner in which chancre first appear, and also to their progress; for they often explain the nature of the constitution at the time." And further on, he describes more explicitly the various irregular actions into which chancre are thrown, by peculiarities of constitution. "If the inflammation spreads fast, it shews a constitution more disposed to inflammation than natural: if the pain is great, it shews a great disposition to irritation: it also sometimes happens, that they very early begin to form sloughs: when this is the case, they have a strong tendency to mortification." In these discriminating observations, that point out, in the clearest though concise manner, the various causes that modify the course of venereal sores, are to be seen the doctrine of modern pathology, stated in the simplest form. Mr. Hunter's object, in all his writings, was the elucidation of principle: a less profitable minuteness of detail he left to others. The distinctions
that he makes between the action of the virus, and the accidental features imparted by circumstances not confined to primary ulcers, are to be met with in different parts of his work where he speaks of the secondary forms of infection: and the spirit of them so deeply tinctures the whole of his views on syphilis, as to make it matter of surprise, that his immediate successors, by overlooking them, should have brought his doctrines into disrepute.

The more immediate effect of a phagedenic tendency in sores is an extension of the ulcerated surface; and the cause lies in a morbid degree of susceptibility or irritability of the system. Ulceration is the destruction of tissue by inflammation: it is clearly not a process of absorption, but one of simple disintegration of tissue: it occurs only when the vital powers are reduced, and are unable to control the action that tends to disorganize the structure. It differs from gangrene in this, that while, in gangrene, vitality ceases before the disintegration of the tissue has time to take place, in ulceration the parts are still subject to the vital powers while they are undergoing a change from a solid organized texture to a fluid inorganic mass. What the state of circulation is in parts undergoing ulceration, is difficult to ascertain: it cannot wholly cease at once, as gangrene would be the result. It is probable that the influence of the nervous and circulating systems are gradually withdrawn from the surface of parts about to ulcerate. Whatever may be the physical explanation, the physiological state is one of weakness, accompanied with an excess of action in both the vascular and nervous system of the part.

The circumstances that bring on this irritability of frame ought to be an object of attention, in the treatment of phagedenic ulcers; for it is to this condition especially that the practitioner has to direct his remedies. In large towns, thronged with a vicious population, these sores are among the most common forms of primary syphilis. Irregular hours, impure air, hard labour, overstrained powers, and intemperance, contribute, each their share, towards disturbing the course of a venereal sore. It first becomes inflamed, and exceedingly painful: the inflamed tissue breaks down,
and ulcerates away: the former healthy limits of the sore, in their turn, undergo the same process. The constitutional state of the patient is evinced in his irritability of manner and loss of rest, in his pallid aspect and slightly vascular conjunctiva, while the heart acts quickly but feebly.

In the adaptation of treatment to these sores, the degree of power which the patient possesses, and the degree of inflammation in the sore, as they materially influence its character, should be special objects of the surgeon’s attention. The general principles of allaying irritability, and giving tone, is the course which the surgeon traces for himself; but something more than this is required, to enable him to arrest these spreading and sometimes intractable sores. The distinctions between an irritable and an inflamed ulcer are sufficiently broad; and yet the terms are often confounded, and even misapplied. An inflamed ulcer, because it is painful, is regarded often as an irritable sore;—an error that leads to most painful mistakes in practice, inasmuch as the treatment most apposite to the reduction of inflammation is neglected, and the sore is brought under the action of remedies that tend rather to increase than allay inflammation. The vivid colour of the surface, the fibrinous deposit covering the granulations, the ichorous discharge, and the thickened edge, one or all evince the existing degree of inflammation; while the absence of those signs, and, in their place, a degree of sensitiveness disproportional to the extent of inflammation, or a disposition to spread by ulceration, is evidence of an irritable state of sore. But though the extreme of each class of sore is distinct enough, the line that divides them is not so clear or defined. Many sores exhibit more or less of both characters. An ulcer may be highly sensitive, and at the same time inflamed; and yet not be disposed to spread, in consequence of the patient’s vis vitæ not being sufficiently reduced: while a similar ulcer, in another patient, attended with the same degree of inflammation, shall become phagedænic, from want of constitutional vigour. Inflammation, therefore, as a cause of phagedæna, is not to be lost sight of; nor an exclusive regard be paid to the irritable
state of the sore, or of the patient. A mixed view of a case leads to a mixed mode of treatment. The degree of inflammation present, and the degree of irritability existing, combined in various proportions, are the conditions that modify the progress of ulcers; and the discernment of the practitioner should be directed to ascertain in what proportions they do exist. Inflammation in one degree, combined with much irritability, tends to destructive ulceration: a higher degree of inflammation, with a less degree of irritability, leads to the yellow slough: while the highest degree of inflammatory action, with a further diminished irritability, produces the dark slough, or common gangrene.

In the constitutional treatment of these sores, if some such principles as the foregoing be borne in view, it is not difficult to arrest them. Mercurial action is wholly inadmissible: it tends to increase irritability, to lower the powers of the patient, and therefore to quicken the phagedenic action. Loss of rest, and the irritability of the arterial and nervous systems to which it gives rise, are the prominent points in these cases. Opium, and its various preparations, must be given, to obtain rest: moderate doses only are required; except in some few cases, that hard-drinking and debauchery have rendered uncontrollable by smaller doses of opium. In such persons, three or four grains are required, to procure sleep. When this desirable object is obtained, the sore often quickly improves in appearance. If the aspect is marked by much vascular action as well as nervous excitement, the cold alkaline infusion of sarsa is the remedy that deserves our confidence. When, in place of a vascular conjunctiva, and flushed face and white tongue, the aspect bears marks of depression and debility, ammonia or quinine, or similar stimulants, are called for. The remedy, however, on which most reliance is to be placed, is iodine, and its combinations.

Before this powerful remedy was known, the medicines on which most reliance could be placed, for the purpose of arresting anormal syphilitic action, when induced by mercury or any other similar cause, were sarsaparilla and mineral acids, especially the
nitric. To these may be added some other tonics in general use. Much as these were esteemed, they were not generally allowed to possess any specific action over the disease, beyond their properties of giving tone to the system, and tranquillizing irritability. That they have great power in arresting unhealthy ulceration of venereal sores, cannot be questioned; and in persons with constitutions impaired by irregularity and disease, in whom mercury is inadmissible, these medicines have a strong claim on our confidence: and when they failed, perhaps more was to be attributed to the inefficient dose, than to a want of efficacy. The salts of iodine have, in great measure, superseded them; as experience has proved them to exert a control over anormal syphilitic action that no remedy, hitherto known, possesses. Its property seems to be stimulant or tonic: it increases vital energy and action, rendering the pulse strong and full; it improves the appetite and powers of digestion, imparting vigour to the chylopoietic viscera: hence its benefit seems especially adapted to that kind of ulceration which depends on want of power, combined with an excess of irritability. In both the mild forms of phagedæna, and in those sores that are covered with the yellow slough, it is found most serviceable: it imparts vigour to the weak textures, and enables them to resist the disorganizing process of ulceration. The inflammation that attends these sores seems also to be within its control; for in a day or two after its exhibition, the sore that had been painful becomes easy, and the blush of inflammation assumes a fainter colour, and its area diminishes. This action of the remedy is seen in chronic inflammation of glands in strumous persons, and is improperly attributed to its absorbent property: absorption is the consequence of the arrest of inflammation; and when iodine can be brought to bear with effect on chronic inflammation, absorption of the effused fluids follows. How much of the control that iodine exerts on anormal sores is to be attributed to a specific power over the poison, is difficult to say; but we are limiting its powers too narrowly, I think, if we confine its action to the common inflammation that surrounds the sore. Both in the pri-
mary and secondary forms of this disease, it is often found to arrest the progress of syphilitic action, in persons who cannot bear mercury; and, next to that mineral, iodine seems to possess the highest anti-syphilitic powers. Its effects are less permanent, and less certain, in the normal forms of disease; but its action is less injurious to the constitution. Mercury increases the irritability of the system in many persons, enfeebles the constitution, and disposes sores to phagedænic action; the effect of iodine is the reverse of this: it may be said that iodine fulfils that in which mercury is deficient. In the normal forms of syphilis, this mineral is rarely found to disappoint the expectation of the practitioner; and in the anormal forms of primary sores, it as rarely fails to do harm; while iodine exerts, comparatively, little influence over the normal chancre, chiefly confining its good services to the sores that are “set astray” by some peculiar condition of constitution. The forms in which I employ it, are the iodide of potassium alone or combined, and the solution of iodine in this salt. I do not find it necessary to increase the dose beyond seven grains of the salt, or half a grain of the pure iodine. In some of those sores that are not amenable to the action of iodine, the aid of mercury, in small doses, is wanted, and in such forms as produce the least disturbance of the system. It is best given at night, with Dover’s powder, in form of the chloride, or the grey oxide with chalk. The action of mercury is sometimes wanted for sores that, having shewn an anormal disposition, have lost it under the action of iodine, and yet will not granulate or cicatrize. The syphilitic action still predominates in them; and yields only to mercury, which should be given in the most guarded manner.

The more intense forms of phagedæna are those in which a sloughing action alternates, or co-exists with ulceration. The action is similar to that which attends the milder phagedænic sores; but the causes that operate are more active, and the destructive ulceration is proportionally more severe and rapid; it may be properly enough called sloughing phagedæna. The prin-
ciples that should regulate the treatment of these sores are the same as guide us in milder phagedæna. The powers of life, in such patients, rarely permit the use of the lancet; nor, indeed, does the nature of the sores require it, as the inflammation is of the asthenic kind, and requires rather an opposite plan of treatment. Rest is usually sufficient to subdue the inflammation that may be present; and when inflammation of a more active kind attends the early stage of phagedæna, a few leeches will suffice for its reduction. To tranquillize the excessive irritability that always accompanies them, is the main object. Opium, or morphia, in full doses, should be given at night, to procure rest; and if that fails, it should be given at intervals of four or six hours, combined with such stimulants as the previous habits of patients may render proper. Camphor, capsicum, and quinine form a useful addition to opium; with the allowance of wine or spirits, that custom has rendered necessary. Stimulants are usually required in the treatment of these sores; but harm is sometimes done by having recourse to them indiscriminately, in all cases. When irritability of the nervous system is joined with great vascular excitement, evinced by a sharp and rather full pulse, a vascular conjunctiva, and a flushed cheek, opium should be given only in small doses at night, and other measures employed that tend to allay irritation, without increasing vascular action. The cold alkaline infusions of sarsa form, in such cases, a good substitute for the stimulants and tonics above mentioned; and as soon as the pulse is quiet, iodine, in some form, is found to put a stop to the ulcerative action. These measures often check the more severe, as they do the milder forms of phagedænic sore; and the propriety of using them, in preference to stimulants, must depend on the condition of the patient; the latter should only be used when the powers of life are enfeebled, and irritability maintained by want of the accustomed stimulus. The local applications that have most efficacy are those of a stimulating kind. The undiluted nitric acid is one of the most effective, as well as most safe; and one application to the whole sur-
face of the ulcer, so as to imbue the whole ulcerating and sloughing textures, is usually sufficient to arrest the mischief; it converts the ulcerative action into a sloughing one; and the white or yellow parts become brown, die, are cast off, and leave a healthy granulating surface. Solutions of nitro-muriatic acid with opium, the cataplasma cumini, Peruvian balsam, with equal quantity of liq. opii sedativi, are useful when the sloughing prevails more than the ulcerative action. I cannot confirm the propriety of giving mercury for the white sloughing sores, as advised by a late writer on syphilis. The recommendation seems fraught with danger; it is inadmissible so long as the ulcerative action is going rapidly on; and should be given, if at all, only when the white coating of the sore has acquired a firmness that indicates the cessation of phagedænic action. Happily, mercury is altogether needless; as iodine is sufficient of itself to check the ulceration, and to produce a healthy granulating surface. Even when every sign of phagedænic action has left the sore, it seems better to defer the use of mercury, for the healing of the sore, or with the view of preventing secondary symptoms. Mr. Carmichael's advice on this head is valuable; and his observations on the action of mercury, in these sores, will be found correct.

The dark brown slough, approaching almost to a black, is the dark slough, result of an action different from the former, in the process of ulceration being wanting, and the texture at once passing into a state of sphacelus, from the rapid change effected in it by inflammation. This kind of sore may be either the effect of a neglected aphthous chancre on the inner prepuce, or may commence as a black sloughing spot on the glans itself. The worst instance that I have witnessed of it began as an aphthous sore on the corona, that healed in three days, and broke out again, after some excess in wine; and immediately assumed a sloughing action, of a most destructive kind. The high degree of inflammation induced by the poison, seems to be the cause of this dark sloughing sore; which is therefore usually more painful than the white sloughing one, and attended with greater constitutional dis-
turbance. It is almost always attended with phymosis; which is not unfrequently the cause of the inflammation that renders the aphthous chancre sometimes so destructive. The tense and turgid state of the prepuce, the escape of a dark sanies from under it, and the general vascular disturbance, point out the nature of the action, and the measures that are promptly to be put in force. When the glans is denuded by a division of the prepuce, a dark-brown or purple slough is seen involving a part of the glans or prepuce; and presenting no defined margin, but gradually terminating in a livid texture about to undergo the same change. So rapid is this action sometimes, that in twenty-four hours it will have gained an inch on the sound structure. The difference between this and phagedænic action is, that in the latter the texture of the part affected retains its vitality, but not its integrity; while in the former, the reverse takes place; the circulation quickly ceasing, while the texture appears to undergo but little change, or even none, if the gangrenous action be rapid.

Whatever may be the cause of parts thus suddenly passing into a gangrenous state—whether the specific action of the poison, or common inflammation in a peculiar constitution—the disease is to be regarded as one of an inflammatory kind, requiring, especially in the commencement, vigorous antiphlogistic measures. A more fatal error cannot well be committed, than to stimulate these sores on the principle of supporting vital action. In looking back upon the cases of black slough that I have treated, I have never had occasion to regret having used early active depletion; and, on the other hand, when the action has not been stopped, it has been from depletion having been either not carried far enough, or not early enough adopted. The loss of blood, by division of the prepuce, is often sufficient to arrest the inflammation, independently of the good the operation occasions by exposure of the unsound part; and it is well to encourage the bleeding to the extent the patient's power will permit. One active depletion will also prevent secondary hæmorrhage—an
accident that may occur with benefit to the patient; but if happening when the disease is advanced, and the patient's powers low, it tends rather to spread the gangrenous disposition, than to check it. The sore should be freely exposed, and dressed with lint steeped in the compound tincture of benzoïn; which is more effective in the dark, than even in the white slough, for the arrest of the sloughing action, and separation of the dead mass. It is seldom necessary to seek the aid of any other local application; as this is more to be relied upon than the chlorides of lime or soda, or the carrot-and-yeast poultices, which are also useful, or than the balsams. As soon as depletion has been carried far enough, and the inflammatory state checked, the slough is usually cast off with rapidity; and a healthy surface, altogether free from syphilitic appearance, is established. If the sloughing action has been active and extensive in its operations, it removes all the parts involved in the specific action of the poison; hence mercury is seldom required in the granulating stage of these sores, and secondary symptoms are not often to be apprehended.
THE EDITOR'S METHOD OF TREATING GONORRHOEA.

I have now given, first, a brief sketch of the origin and progress of the venereal disease from the earliest period down to our own times, by way of Introduction.

2nd. Those sterling principles of practice taught by our late lamented author Sir Astley Cooper, during a period of nearly fifty years, in the Borough Hospitals of Guy's and St. Thomas's, London.

3rd. The principles and practice of Mr. Lawrence, the Senior Surgeon at St. Bartholomew's, on syphilis.

4th. A digest of those excellent articles on syphilis from the British and Foreign Review.

5th. A very able paper on the classification and mode of treatment of syphilitic sores, by Mr. Aston Key, Senior Surgeon of Guy's Hospital, wherein he has evidenced a most profound knowledge of the subject, and the most rational method of cure; and now—

6th. At a humble distance from those great masters, I will endeavour to give a short sketch of my method of treating gonorrhoea.

The nitrate of silver has been a favourite remedy with me, for upwards of twenty years, in every case where I could apply it, whether syphilitic, erysipelatous, chronic ulcers, &c.; but it is not above five years since I first commenced its use in gonorrhoea, as an injection in a very mild form, gradually increasing its strength to a saturated solution, and in this state I have repeatedly removed a gonorrhoea by one application; however, I do not advise a saturated solution to be invariably employed. I have three degrees of strength, i.e. 3ij, 3iij, 3iiij, to the ounce of distilled water. Now since every description of gonorrhoea may be considered à priori a local affection, it must necessarily occur to every practitioner
that the treatment should be local too; then why should we put such dependence on constitutional remedies, when they can have but a very remote action on the urinary canal? the frequent failure of which led to the employment of emollient, sedative, and astringent injections, all of which are more or less objectionable: I admit they may suppress the discharge, but I am very certain, that bubo, orchitis, and stricture result from such practice.

A very reasonable question may arise, whether the same objections may not be urged against the nitrate of silver? Certainly pot, for I have employed it in upwards of 300 cases with the most satisfactory result. In one case only where I used the saturated solution in a very high state of inflammation it caused considerable pain at the time, and some difficulty in micturition accompanied with some drops of blood, but in about twelve hours the inflammation had entirely subsided, and some small portions of the mucous membrane were detached next day with the urine. In five days the patient was perfectly well with this single application.

Seeing the powerful effect of the nitrate of silver employed as an injection, I began to modify its use, and for this purpose I procured three glass tubes, corresponding to numbers four, five, and six of the common catheter, not exceeding four inches in length, gradually tapered for an inch at one end, and nicely polished on an oil-stone. The size of the canal regulates me which tube I shall select for the introduction of a small slip of lint saturated with a solution of the nitrate of silver, or the tincture of iodine.

Previous to the insertion of the lint, I wash out the canal with a weak solution of the sulphate of zinc; then I dip the tube into the solution No. 1 of the nitrate of silver, until a sufficient portion of the lint be saturated; then dipping the end of the tube in some ointment of the nitrate of silver, I introduce it about two inches and a half into the urethra, which I effect by leaving a small portion of the lint beyond the end of the tube, and, with the forefinger and thumb of the left hand, I grasp this projecting portion, withdrawing the tube with the right, desiring the patient to retain it there for two or three hours, and to withdraw it when he requires to make

Does it induce stricture?

Efficacy of Nit. Argenti and Iodine.

Lint introduced by small glass tubes.
water. This first operation causes the patient to experience some smart twinges for about half an hour, after which it gradually subsides, and he feels little or no inconvenience afterwards; meantime I give him a saline aperient, with a little carb. of soda, to which I may add a few drops liq. opii sed.

In two or three days afterwards, according to circumstances, I repeat the lint dipped in the solution No. 2, leaving it for two or three hours as before: in the intermediate space of those insertions, I wash out the urethra with a weak solution of iodine, zinc, or the nitrate of silver. On the third day from the second insertion, of the lint, I repeat the introduction of the lint dipped in solution No. 3, leaving it as before, and if the discharge have not ceased, I repeat it until it be entirely subdued, which generally takes from seven to fourteen days; the average or mean of three hundred cases of simple gonorrhoea will be about ten days.

It not unfrequently happens that a discharge resembling that of simple gonorrhoea becomes chronic from some sore or chancre in the canal; the patient tells you that, in the morning when he attempts to make water, the orifice of the urethra is closed up, offering a partial resistance to the exit of the urine: this obstruction arises sometimes from a combination of the thick purulent matter secreted by the sore, and an abnormal secretion of the prostatic fluid, and when exposed about the orifice of the urethra during the night, the heat of the body causes the evaporation of the watery portion, leaving another portion adherent to the lips of the urethra. In these cases, I take one of my tubes with a bit of lint cut very short in form of a brush, and dip it in a solution of the nitrate of silver, and with this brush I spunge the urethra repeatedly, particularly that part where I may sometimes detect the seat of the sore. A perseverance in this plan for a short time every day will be attended with complete success.

Sometimes it may be prudent to treat such cases constitutionally: then I give from ten to fifteen grains of the hydriodate of potass with five grains of blue pill in the twenty-four hours.

External sores, whether venereal, or otherwise mild in character,
I dress with the nitrate of silver and tincture of iodine. When I wish to produce the full effect of the nitrate, I expose the sore for a short time to the influence of the air, which facilitates the removal of the slough on the next dressing.

I am indebted for the following Formulae to a very excellent little work of Mr. L. Parker, and I hope it will be of some service not only to the student, but also to the general practitioner.

**FORMULÆ OF PRESCRIPTIONS.**

**A Sedative Night Pill.**

R Pulv. Opii, gr. j.
Pulv. Capsici, gr. ij.
Conf. Aromat. q. s. ft. Pil.
Omni nocte sumend.

Or,

R Liq. Opii sedativ. m xx. ad xxx.
Tinct. Capsici, m xxx. ad l.
Aqua Cinnamomi, ʒj.
M. ft. Haust. ss.

**An Astringent Gargle to correct the Fetid Breath.**

R Sodae Chlorid. Solutionis (Beaufoy's).
Tinct. Myrrhae, ā ā. ʒss.

R Aqua distillatæ, ʒvij.
Aluminis et Potassæ sulph.
Əij.
Mellis Rosarum, ʒj. M. ft.
Garg. (Ricord).

**Lozenges of Chloride of Lime.**

R Calcis Chlorid. ʒiv.
Sacchar. alb. ḳbj.
Amyli, ʒiv.
P. Gum. Tragacanthe, ʒj.
M. Aquaæ Aurantii, q. s.
The mass is to be made into lozenges of three grains each. Their use is principally in removing the mercurial fætor of the breath.

**The Proto-chloride of Mercury.**

R Hydrargyri Chloridi.
Ext. Conii, ā ā. gr. j.
M. Pulveris Glycyrrhiza, q. s.
ft. pil.

**Another Form.**

R Ext. Conii, gr. iiij.
Hydrargyri Chlorid. gr. j.
Antimonii Sulphureti praecip. gr. j.
M. ft. pil.
ON THE VENEREAL DISEASE.

Ricord's Form.

R Hydrargyri Chloridi, ʒj. Pulveris Conii.
Saponis Hispaniolæ, āā. ʒj.
M. ft. pil. xxiv.

These pills are employed by M. Ricord in the treatment of enlargements of the testicle, which remain after inflammation of this organ, complicating or succeeding to gonorrhœa (epididymite blennoragique).

Form in Use at Val De Grace.

R Hydrargyri Bichlorid. gr. ¼.
Pulv. Opii, gr. ½ M. Pulv. Glycyrrhizæ, q. s. ft. pil.

One a day for the first ten days, the dose then to be gradually increased. M. Desruelles does not exceed half a grain of this salt a-day.

Dupuytren's Form.

R Hydrargyri Bichlorid. gr. ij.
M. ft. Pil. xvi.

M. Dupuytren was of opinion that small does of the bichloride of mercury were more efficacious than larger ones; he rarely exceeded the sixth of a grain for a dose. One of the pills of the above form were given three times a-day.

M. Cullerier's Form for the Employment of the Proto-Ioduret of Mercury.

R Hydrargri Proto-ioduret. gr. xij.
M. ft. Pil. xxiv.
Capiat unam nocte maneque.

Pommade of Val De Grace.

R Hydrargyri Proto-ioduret. ʒj.
Adipis, ʒj. M.

Employed in friction on tumours and indolent buboes after all acute and inflammatory symptoms have disappeared.

Gargle of the Cyanuret of Mercury.

R Hydrargyri Cyanuret. gr. x.
Infus. Lini Comp. ibj. M.

The dose of the Cyanuret is from ¼th of a grain to a grain.
Pills of the Cyanuret of Mercury.

℞ Hydrargyri Cyanuret. gr. viij.
Pulv. Opii, gr. xvij.
Ext. Guaiaci, 3ij.
M. ft. Pil. lxiv.
Capiat unam ter die.

Ointment of the Cyanuret of Mercury.

℞ Hydrargyri Cyanuret. gr. xij.
Adipis 3j.
M. ft. Unguentum.

Solution of the Cyanuret of Mercury.

℞ Hydrargyri Cyanuret. gr. vj.
ad x.
Aqüæ, 1b. M.

M. Parent's Cyanuretted Pills.

℞ Hydrargyri Cyanuret. gr. xxiv.
Ammoniæ Muriatis, 3iiij.
Guaiaci Gummi, 3iiij.
Ext. Aconiti, 3iiij.
Ol. Anisi, m. xxiv.
M. Mucilaginis, quantum suff. ft. pil. cccc.

One or two twice or three times a-day, the dose to be gradually increased. Each pill contains about the \( \frac{1}{16} \) th part of a grain of the Cyanuret. These pills are a substitute for the bi-chlorides of mercury in many forms of secondary syphilis.

Another Form of M. Parent.

℞ Hydrargyri Cyanuret. gr. vi.
Opii, gr. xij.
Micae panis, q. s. ft. pil. xcvi.

Each pill contains \( \frac{1}{16} \) th part of a grain of the cyanuret of mercury adapted to forms of primary syphilis. The dose, of one or two pills twice a-day in the commencement, gradually increased.

Ointment of the Deuto-phosphate of Mercury.

℞ Hydrargyri Deuto-phosphatis, gr. viij.
Adipis, 3j.
M. ft. Unguentum.

In cases of indolent bubo, a few grains are to be rubbed daily on the tumour, frictions also are to be made on the groin of the opposite side. Our experience in the use of this remedy is drawn chiefly from the practice of Fiore and the Neapolitan surgeons; it is scarcely used in France, although occasionally employed in Germany.
An Astringent Lotion of the Acetate of Lead.

R Plumbi Acetatis, 3j.
Aquæ distillata, 3vij.
M. ft. Lotio.—(Ricord).

An Astringent Powder of the Subcarbonate of Lead.

R Plumbi Subcarbonat.
Pulvis Cinchonae, aa. 3j.
Pure Tannin, gr. v.
M. ft. Pulvis.

An Astringent Injection of Poppies.

R Decoct. Papaveris, h. ij.
Aluminis ust. gr. xx.
M. ft. Injectio.—(Desruelles.)

Simple tepid water, with alum in the proportion of eight or ten grains to the pint, forms an exceedingly useful injection, particularly where large quantities are used.

Preparation employed by Cullerier.

R Cerati simplicis, vel Mellis.
olei Olivaæ, aa. 3j.
Hydrargyri Chlorid. 5ss.
Ext. Opii, 3j. M.

Introduced between the glans and prepuce, by means of a camel-hair pencil; a remedy of great value.

Mixture of the Balsam of Copaiba.

R Bals. Copaibæ.
Pulv. Cubebæ, aa. 3j.
Liq. Potassæ, 3ij.
Pulv. Acaciaæ, 3ss.
Aquæ Rosæ, 3vij. M.

Pills.

R Sapo. Hispaniolæ, 3ij.
Bals. Copaibæ, 3j.
Pulv. Glycyrrhizæ, q. s. ft.
pil. cxx.
Dose from fifteen to forty a-day, at intervals.

R Ext. Catechu, 3ss.
Bals. Copaibæ, 3ijj.
Terebinthinae Chiae, 3j.
Sanguinis Draconis, 3ss. M.
To be made into pills or boluses of ten grains; from ten to thirty are to be taken daily, at intervals.

R Ext. Catechu.
Bals. Copaibæ, aa. 3ijj.
Hyd. Chlorid. Æj.
Pulv. Glycyrrhizæ, q. s. ft.
pil. cl.
Doses, twelve a-day, at intervals.

When employed as an enema, the dose of the balsam should be from half an ounce to an ounce.
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Injections.

R Bals. Copaibæ.
Vitelli ovi, ἀα. 3 ss.
Infus. Rosae, 3 xv. M.

R Bals. Copaibæ, 3 j.
Sacchar. alb. 3 j.
Sp. Vini, 3 vi.
Aquæ distillatæ, f. 3 j.
Ext. Opii, gr. vi.

Particular forms for the exhibition of Cubebs.

Mixture of the Cubebs and Copaiba.

R Bals. Copaibæ, 3 j.
Pulv. pip. Cubeb. 3 j.
Vini Xeric, 3 iij.
Aquæ Rosæ, Aurantii, vel
Mentheæ, 3 v.
Pulv. Acaciæ, q. s. ft. mist.

Particular forms for the Administration of Copaiba.

Mixtures.

R Bals. Copaibæ, 3 j.
Mucilaginis Gummi Acaciæ,
3 j.
Vini Xeric, 3 iv. M. (Val de
Grace).
A fourth part twice a-day, or
oftener.

R Bals. Copaibæ, 3 j. ad ij.
Aquæ, 3 iv.
Vitelli ovi, No. 1.
Liq. Opii, sedativ. m x. ad
xx. M. (Cullierier.)
The quarter part or more,
night and morning.

R Bals. Copaibæ.
Syrup. Tolutani.
Mucilaginis Gummi Acaciæ,
ἀα. 3 j.
Aquæ Rosæ, 3 ii j.
Sp. Ætheris Nitrici. 3 ii j.
The quarter to the half, night
and morning.

R Aquæ Mentheæ Pip.
Sp. Vini rect.
Bals. Copaibæ.
Aquæ Aurantii, ἀα. 3 ii j.
Sp. Ætheris Nit. 3 j. M.
(Chopart.)
Two large spoonfuls night and
morning.

R Resinae Copaibæ.
Spir. Vin. rect.
Aquæ Mentheæ Pip.
Aquæ Aurantii, ἀα. 3 ii j.
Sp. Ætheris Nit. 3 ii j. M.
(Chopart.)
Three or four large spoonfuls night and morning.

Mixtures.

℞ Ferri ioduret. gr. i j. ad x. or more.
℞ Pulv. Opii, gr. ¼.
℞ Mucilaginis, q. s. ft. Pil.

To be taken three times a-day.

℞ Plumbi Acetatis, 3j.
℞ Bals. Copaibae, 3j.
℞ Pulv. Glycyrrhiza, q. s. ft. pil. xxiv.

Dose. — One pill to eight. Employed with advantage by Desranelles in chronic gonorrhœa.

℞ Terebinthinæ Chiaæ.
℞ Sanguinis Draconis, āā. 3ij.
℞ Olei Terebinth. q. s. ft. pil. xxx.

Dose.—From three to six or more a-day.

℞ Guaiaci Resinæ pul.
℞ Terebinthinæ Chiaæ, āā. 3j.
℞ M. ft. pil. xxiv.

Three or four to be taken twice or thrice a-day, in gleet or chronic gonorrhœa.

Electuary of Cubebs.

℞ Sanguinis Draconis.
℞ Pulv. Ratanhiæ.
℞ Ext. Catechu, āā. 3ij.
℞ Bals. Copaib. q. s. ft. Elect.

Dose. — From two to four drachms in the twenty-four hours, in chronic gonorrhœa, or gleet.

Pills of Cubebs and Copaiba.

℞ Bals. Copaibæ, 3ss.
℞ Vitelli ovi, q. s.

To be made into pills of five grains each.

Dose.—From six to sixty a-day, at intervals.

℞ Pulv. Pip. Cubebæ, 3ss.
℞ Bals. Copaibæ, 3ij.
℞ Ferri Sulphatis, 3j.
℞ Resinæ flavæ, vel Terebinthinæ Chiaæ, 3ijj. M.

To be made into boluses of ten grains each.

Dose.—From fifteen to thirty a-day, at intervals. In chronic gonorrhœa, or gleet, in lax constitutions.
Ferri Carbonat. 3ss. ad 3j. M. ft. pulv.

This mode of exhibiting cubebbs combined with the carbonate of iron is much and successfully employed by Ricord, after the acute symptoms of a gonorrhoea have subsided. One powder should be taken three times a-day.

Calomel combined with Antimony and Opium.

R Hyd. Chlorid. gr. j. ad iij.
Pulv. Antimon. gr. iiij. ad v.
Pulv. Opii, gr. ss. M.
Ext. Aromat. q. s. ft. pil.

To be taken night and morning.

If the disease occur in a gouty or rheumatic constitution, colchicum may be substituted for antimony in the above prescription.

Injections.

R Argent. Nit. gr. ij.
Aqua distillatae, 3viij. M. ft. Injectio.
R Plumbi acetatis, 3ij.
Aqua Roseæ, 3vi. M.

This strength is for the male urethra; if used as an injection in vaginal gonorrhœa, &c., the quantity of the acetate of lead may be increased as far as an ounce to the pint of water.

R Argent. Nitrat. 3j.
Aqua ferventis, Oj. M.

As an injection in chronic urethritis.

R Adipis, 3j.
Argent. Nitrat. gr. iv. M.

Of use in the same affection, smeared on a bougie, and thus passed into the urethra.

R Hydrargyri, Bichlorid. gr. iv.
Aqua dist. 3viij. (Wallace.)
R Zinci acetatis, gr. xij.
Aqua, 3viij. M.
R Cupri Sulphatis, gr. xij.
Aquaæ, 3viij. M.
R Zinci Chloridi, gr. viij.
Aquaæ, 3viij. M.

The strength gradually increased.

Liniments.

R Olei Camphorati, 3j.
Tinct. Opii, 3j. M. ft. Linimentum. (Cullerier.)

Or,

R Adipis.
Ext. Belladonnae, aā. 3j. M.
The emplastrum "de Vigo," c. Hydrarg. is generally employed for the purpose of strapping the testicle when compressed, in the French Venereal hospitals; it resembles much, though it is in some points superior to, the Empl. Ammoniaci cum Hydrargyro of the London Pharmacopeia. The form is as follows:—

**R Hydrargyri**, 95 pts.
**Styracis liquidae**, 48 pts.

These are to be rubbed together till the globules of mercury disappear; then melt together, in a separate metal pot:

- **Emp. Plumbi**... 312 parts.
- **Ceræ flavæ**... 16
- **Terebinthinae puræ**... 16
- **Picis Burgund.**... 16
- **Gum Ammoniaci**... 10
- **Olibani**... 5
- **Myrrhæ**... 5
- **Croci in pulv.**... 3

These ingredients are to be well mixed, first among themselves, and then with mercury and styrax. The plaster thus made is to be spread upon linen, calico, or thin leather, and then cut into strips of convenient thickness.

During the local treatment of the disease, the patient is to persevere in the use of specific antigenorrhœal remedies; the copaiba, cubebs, and a mild mercurial course may be recommended, to remove any thickening or enlargement which remains after the more acute symptoms of epidymitis and its complications have subsided. Ricord employs the following form of pill in these cases.

**R Hydrargyr. Chlorid. Ḣj.**
**Pulv. v. Ext. Conii, Ḣii.**
**Sapo. dur. Ḣij. M. ft. pil. xxiv.**

**Injections.**

**R Argent. Nitrat. gr. x.**
**Aque, Ḣj. M. ft. Injectio.**

**R Aqua, Ḣij.**
**Plumbi Acet. Ḣij. ad Ḣij.**

**R Aqua, Ḣij.**
**Aluminis Sulph. Ḣij.**
**M. ft. Inject.**

**R Tannin, Ḣij. ad Ḣj.**
**Vini Rubri, Ḣvj. M.**

**R Gum. Kino, Ḣj. ad Ḣij.**
**Aluminis Sulph. Ḣj ad 3ss.**
**Aque ferventis, Ḣij. M.**

(Swediaur.)
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Pulv. Cinchonae, ʒij. M.
(Hotel Dieu.)

Pulv. Catechu.
P. Myrrhae, āā. ʒj.
Liquor Calcis, ʒiv. M.

Aquæ, pts. 12 ad 16. M.
(Hospital des Veneriennes.)

Preparation of the Nitrated Acid of Mercury.

Acid. Nitric, pts. 8. M.

The above solution may be applied also as an injection, diluted to suit the feelings of the patient, and the character of the disease. M. Ricord has employed it diluted with twelve parts of water as an injection in uterine gonorrhœa, &c.; its use sometimes occasions pains and violent hysterical symptoms attended with stupor. Owing to these circumstances, M. Ricord generally prefers a solution of the nitrate of silver of the strength above indicated.

Local Applications employed by M. Ricord.

Adipis, ʰj.
Vini Opii, ʒj. M.

Ext. Opii purificati, gr. viij.
M. ft. Inject.

Vini aromatici, ʒvij.
Tannin, ʒij.

Ointment.

Resinæ flavæ.
Gum Elemi.
Ceræ flavæ, āā. ʒj.
Ol. Olive, ʒvj.
Olei Terebinthinae, ʒij.
M. ft. Unguentum.

Opium combined with Mercury.

Cerat. Opiat. ʒj.
Hyd. Chlorid. ʒij. M.

Cerat. Opiat.
Ung. Hyd. Fort. āā. ʒj. M.

Opiate Dressing.

Ung. Hyd. ʒj.
Ext. Opii, ʒj. M. (Wallace.)

Digestive Ointment with Opium.

Ung. Digest. ʒijd.
Pulv. Opii, ʒj. ad ʒijd. M.

Solution of the Bichloride of Mercury.

Hyd. Bichloridi, gr. xx.
Aquæ distillatae, ʒj. M.
The Lotio Alba of the French Hospitals.

R Plumbi Acetat. Ωij.
Aquæ, ³xvj. M. (Ricord.)

Ricord employs the following as discutient plasters:—The "Emp. Ammoniac. cum Hydrargyro" of the London Pharmacopoeia, the Emp. de Vigo, of which I have already given the form:

Or,

R Emp. Belladonnæ, pts. 8.
Plumbi ioduret, pt. 1. M.

M. (Dupuytren.)

R Emp. Belladonnæ, ³iv.
Iodinii, ³j. M.

R Emp. Hydrarg. ³iv.
Iodinii, ³j. M.

Ointment of Proto-ioduret of Mercury.

R Hydrarg. Proto-ioduret. Ωj.
Adipis, ³j.
M. ft. Unguentum.

Lotion of the Tincture of Iodine, used as a compress.

R Tinct. Iodinii, ³j.
Aquæ distillatæ, ³ij.
M. ft. Lotio.

Metallic Solutions.

R Cupri Sulph. gr. vj.
Aquæ distill. ³ij. M.

R Argent. Nit. gr. vj.
Aquæ, ³j. M.

R Zinci Sulph. gr. x.
Aquæ, ³j. M.

Aquæ, ³j. M. (Cullerier.)

Ointments of the Proto and Deuto-iodurets of Mercury.

R Adipis, ³j.
Hyd. Proto-ioduret, gr. xxv. M.

R Adipis, ³j.
Hyd. Deuto-ioduret, gr. xvj. M.

Syrup of Larrey.

R Syrup, sudorific. ³bij.
Hydrarg. bichlorid. gr. xx.
Æther. sulphuric. ³ij.
Ext. Opii, gr. xx.
Ammoniæ muriatis, gr. xx. M.

R Iodinii, gr. j.
Potassæ Iodid. gr. ij. ad iv.
Aquæ, ³j. M. (Cullerier.)

Sudorifics.

R Rad. Sarsaparillæ, ³xij.
Aquæ, ³bxxiv.
Boil for two hours, and add
Aluminis Sulph. ʒjss.
Hydrarg. Chlorid. ʒss.
Antimonii sulphuret. ʒj.

Boil down to two thirds, and add
Fol. Sennæ, ʒiij.
Rad. Glycyrrhizæ, ʒjss.
Sem. Anisi, ʒss.

Infuse for an hour and strain.

_An Anodyne Pill._

Ext. Conii, gr. v., vel
Pulv. Opii, gr. ss.
M. ft. pil. o. n. sumend.

*Compound Mucilaginous Mixture.*

R Decocti Althææ officinalis, Oj.
Hyd. Bichlorid. gr. xvij. M.
_(Biett.)_

_Mercurial Honey._

R Hyd. Chlorid., ʒj.
Mellis opt. ʒj. M.

_An Escharotic Lotion._

R Hyd. Deuto-nitritatis, ʒss. ad
ʒj.
Acid. nitric. ʒj. M.
ANATOMY OF THE EYE.

Orbits. The eyes, or organs of vision, are contained in two somewhat irregular funnel-shaped or pyramidal cavities, that are situated on either side of the root of the nose, and immediately under the arch of the forehead. These cavities, which are denominated the Orbits, have their apices looking backwards and inwards, and their bases outwards and forwards; the axes of the two orbits consequently are oblique lines, which, posteriorly, converge and decussate about the sella turcica, while anteriorly, on the contrary, they diverge; an arrangement by which the field of vision is greatly extended.

Their parietes. The walls of each orbit are formed by seven bones; namely, the frontal, sphenoid, æthmoid, lachrymal, maxillary, palate, and malar bones. The upper wall or roof of the orbit, which is formed by the orbital plate of the frontal bone, and the lesser wing of the sphenoid, is concave, presenting anteriorly depressions externally for the lachrymal gland and internally for the trochlea. The floor of the orbit is nearly plane, and inclines downwards and outwards; it is formed by the malar, superior maxillary, and palate bones; the infra-orbital canal extends along its under surface, transmitting vessels, which freely anastomose with the facial, and a nerve which endows the face with common
sensation. The external or temporal wall is formed by the malar and sphenoid bones, and diverges considerably. The internal or nasal wall is formed by the lachrymal, æthmoid, sphenoid, and palatine bones; it is plane and nearly parallel with its fellow of the opposite side. Anteriorly, the base of the orbit is formed by the frontal, the malar, and superior maxillary bones.

The foramina opening into this cavity are numerous. Anteriorly, in the base of the orbit, there are four, viz., the supra-orbital, for the transmission of the supra-orbital or frontal nerve; the infra-orbital, for the transmission of vessels, the second division of the fifth or superior maxillary—conferring sensation upon the face; the malar, for the passage of a branch from the lachrymal nerve, to communicate with the facial nerve; and the nasal duct. Within the orbit there are five foramina; namely, the optic, for the transmission of the optic nerve and ophthalmic artery; the foramen lacerum orbitale superius, for the transmission of the third, the fourth, first division of the fifth, the sixth nerves, and ophthalmic vein; the sphenoid-maxillary fissure, for the passage of the sphenoid-maxillary nerve; and two internal orbital foramina, in the suture connecting the frontal and æthmoid bones, for the transmission of vessels and nerves,—the anterior one transmitting the nasal division of the ophthalmic nerve, and the other a small artery called the posterior æthmoidal.

The contents of the orbit are—the eye and its appendages, imbedded in a quantity of adipose substance. We will first proceed to the examination of the appendages, which, for convenience of description, may be further divided into the orbital, situated posterior to the cornea; and the facial, placed anterior to the cornea.

**FACIAL APPENDAGES.**

The arch of the eyebrow corresponds to that of the superciliary ridge upon which it is planted, and extends from the tuberosity of the frontal sinus to the external angle of the orbit. It consists of a thick row of strong short hairs, which have an almost erect dis-
position at the commencement of the brow, and proceeding outward, become arched obliquely, and gradually reduced in number so as to terminate the arch acutely. The few erect hairs correspond to the fibres of the corrugator supercilii muscle, the crescentic to the fibres of the orbicularis palpebrarum.

The extent and fulness of the brows vary greatly in different persons. In some, especially persons of dark complexion and black hair, they have little, if any, interspace at their origin, and are long, prominent, and bushy in the centre of the arch. Among the ancients these were esteemed points of female beauty. The fibres of the occipito frontalis, or epicranial muscle, terminate beneath the skin of the supercilium, blending with those of the orbicular muscle of the palpebra, and extending downwards between the supercilia, under the name of the pyramidal muscle. The former elevates the brow, wrinkling the integument of the forehead horizontally; the latter depresses it, and closes the eyelids, being the sphincter palpebrarum; the pyramidal giving the frowning air by producing the perpendicular wrinkling.

The corrugatores approximate the heads of the supercilia, drawing the integuments over the root of the nose into deep longitudinal rugae: they cooperate with the orbicularis, and partly the pyramidalis, in the act of frowning. The action of the subjacent muscles renders the brow an important feature in regulating the quantity of light, contracting the field of vision, and in assisting the expression of the sterner passions. It would not be an useless ornament if it were insusceptible of motion, the hair being advantageously placed upon the projecting ridge of the orbit to entangle and arrest particles, solid and fluid, as perspiration, which might otherwise fall or trickle upon the eye. The habitual depression of the brow is usually a concomitant of a weak or morbid retina; it is characteristic of strumous inflammation, and is observable in all cases where light is offensive, and in those central circumscribed opacities of the cornea and lens, in which the dilated state of the pupil is necessary to vision.

The palpebrae, or eyelids, are those semi-oval curtains which
cover the great aperture of the orbit, and graduate the light falling
upon the eye by the degree of their separation, or exclude it by
their apposition. They consist of the skin externally, the con-
junctiva membrane internally, and between the two are placed the
orbicular muscle, tarsal cartilage, and Meibomian follicles; they are
remarkable for the absence of adipose matter; and lastly, along
the free edge of each there is a row of hairs, which are denominated
cils, or eyelashes, arranged in rows: in the superior there is also
the expansion of the levator palpebræ muscle. The skin covering
the palpebræ is thin, and loosely connected to the subjacent parts
by a fine lax cellular texture, which abounds at the orbitar margins
of the palpebræ. The frequent Ædema of the eyelids, so dis-
figuring to the countenance, is owing to the abundance of this
tissue void of fat, and subject therefore to serous infiltration.

On removing the skin and the subjacent cellular tissue of
the palpebræ, the thinly spread fibres of the orbicularis muscle
may be observed; broad, thin, and somewhat oval, in some sub-
jects very pale and indistinct, in others strong and well marked;
it arises from the internal angular process of the frontal bone,
and from a tendon at the inner angle of the eye, by a number
of fleshy fibres which pass round the orbit, covering first the
superior and then the inferior eyelid, and also the bony edges
of the orbit: it is inserted into the inferior edge of the tendon
from the upper part of which it had its origin, called tendo oculi,
into the nasal process of the superior maxillary bone. This
muscle is covered by and adheres to the skin; superiorly it inter-
mixes with the occipito frontalis, and covers the corrugator super-
ciliii, the frontal vessels and nerves, the tarsal cartilage, and levator
palpebræ superioris; inferiorly it intermixes with the muscles of
the cheek and lips, and sometimes with the platisma myoides, and
covers the inferior eyelid, the origin of the levator anguli oris,
and the infra-orbital vessels and nerves. The external or orbital
fibres of this muscle are strong and red, and run circularly round
the base of the orbit; the middle or palpebral fibres are pale, thin,
and scattered, and are contained in the eyelids; the internal or

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ciliary portion is a thick but pale fasciculus, situated under the ciliae, at the edge of each eyelid. The palpebral and ciliary portions adhere more closely to the skin, and present an elliptical appearance, as the fibres from the upper and lower eyelid intersect each other at the outer canthus, and adhere to the ligament of the external commissure. The horizontal tendon of this muscle passes across the lachrymal sac, a little above its centre, and a strong aponeurosis, derived from its upper and lower edge, covers all the anterior surface of the sac, and adheres to the margins of the bony gutter, in which it is lodged. This tendon can be seen or felt through the integuments during life, particularly when the muscle is in action, or when the eyelids are drawn towards the temple. In the operation of opening the lachrymal sac, the incision should commence immediately below this tendon, and be carried obliquely downwards and outwards, to the extent of about half an inch.

The inner canthus, formed wholly of the doubling of the integument, is that notch, or triangular sinus, formed between the tarsi and the tendon of the orbicularis muscle.

The tarsi are two elliptical, elastic plates of cartilage, which give firmness and figure to the palpebrae, and afford a basis for the attachment of their several parts. The superior is semi-lunar and larger than the inferior, which is long and narrow. Their ciliary margins are thick: their orbital margins thin, and connected to the orbit by the palpebral ligaments, which are a continuation of the periosteum; these ligaments are stronger towards the temple, where they decussate and attach the cartilages at their external canthus or commissure; the tendo-oculi fixes them internally. Their temporal extremities are angular, their nasal rounded. The convex surface of the tarsi is covered by the fibres of the orbicularis and the cellular membrane, connecting them with the integument; the concave, which is exactly moulded to the surface of the globe, is covered by the conjunctiva membrane.

The exterior borders of the sloped edges of the tarsi, which are opposed to each other, are furnished with cilia, or eyelashes, dis-
posed in three or four rows; the superior point obliquely outwards, the inferior, inwards, and when the two are brought together, they form very acute angles: these we may therefore call the ciliary borders of the tarsi. The apertures in which their bulbs are contained, are seen in the integument when the cilia are extracted; they are more numerous and longer upon the centre than the extremities of the tarsal arch, and fewer and shorter on the lower than the upper tarsus. Their direction is curved, those from the upper being arched upwards, from the lower downwards. The length and fulness of the eyelashes vary in different individuals. They are commonly of the same colour as the eyebrows.

Upon the interior border of the tarsus the mouths of a row of follicles, seated vertically on the concave surface of the tarsus, form a slightly eminent line. These follicles are of a white or yellow colour; are arranged in nearly parallel vertical rows, and are more numerous in the upper than the lower eyelid; when magnified, they appear to be small knotted tubes, resembling studs of the smallest pearls, arranged for the most part in parallel lines, and communicating with each other at their origin from the orbitar edges of the tarsi, but terminating by distinct orifices upon their interior borders, which we may distinguish from the ciliary as the Meibomian borders of the tarsi. In their length, connexion, and arrangement, they present considerable variety. The fluid they secrete in health is thin and sebaceous, lubricating the tarsal edges, preventing the effects of attrition from their frequent contact, and facilitating their motions over the contiguous surface of the globe. In diseased states of the follicles, this fluid may be secreted in a condensed form, constituting lippitudo—implicating the roots of the ciliae, or after death in the shape of small white worms.

The obliquity of the tarsal edges, which are opposed to each other, form a triangular groove, or sulcus, between the Meibomian borders and the surface of the globe, when the ciliary borders are in contact. This increases in breadth toward the nasal angles of the tarsi, where the puncta, or orifices of the lachrymal excretories, are
placed upon two small eminences accurately opposed, and terminating the Meibomian borders; they are two pin-holes formed in the cartilaginous substance, and thus preserved permanently open.

The *lachrymal ducts* extend from the puncta to the lachrymal sac; the superior is longer and more curved than the inferior; the former is concave inferiorly; the latter is nearly straight, a little concave upwards; they both open into the external part of the sac, a little above its middle, sometimes by one, and sometimes by distinct orifices, behind the *tendo oculi*; each duct is surrounded by a process of that tendon, and the tensor tarsi, and lined by mucous membrane.

The *lachrymal sac* is a small oval pouch of mucous membrane, closed above, and leading below into the nasal duct; it is situated in a fossa formed by the anterior concave portion of the os unguis, and the nasal process of the superior maxillary bone on which it rests; in front it is covered by the skin, the tendo oculi, some fleshy fibres of the orbicularis, and a strong fascia, which is derived from the tendon, and connected to the surrounding bony margin. On its outer side there is an opening for the reception of the lachrymal duct; and below it terminates in the nasal duct. A small muscle has been described by Mr. Horner as *arising* from the edge of the os unguis, and inserted into the lachrymal sac and duct, which he conceives to have the power of compressing the sac, and directing the ducts and their contents towards it; it is not, however, in all subjects, to be distinguished from the orbicular, which last can effect the purpose ascribed to this small muscle.

The *nasal duct*, which is the continuation of the lachrymal sac, and is about three-fourths of an inch in length in the recent state, descends obliquely backwards and a little outwards, surrounded by the maxillary, unguis, and inferior spongy bones; beneath the latter it opens by a small slit-like orifice, which is surrounded by a circular fold of mucous membrane, into the lower meatus, about an inch from the anterior part of the naris; this duct is formed of mucous membrane only; it is connected to the periosteum.

The puncta absorb the tears, which have been conducted by the
tarsi from the lachrymal ducts, and convey them into the sac, to pass off by the nasal duct.

The integument of the eyelids is inflected at the edges of the tarsi, and lines the whole of the concave surfaces of the palpebrae; is reflected upon the visible surface of the globe, enters into the puncta, lines the lachrymal sac, and at the nasal extremity of the duct is continuous with the common mucous membrane of the nostrils, fauces, and alimentary canal.

The conjunctiva, having lined the interior surfaces of the tarsi, is connected to the ligaments of the tarsi and palpebral muscles, and thence reflected on the globe of the eye, so as to form an oblong sac or pouch. Its attachment to the sclerotic is such as to prevent its forming folds in the motions of the globe, to the freedom of which it offers no impediment. As it approaches the cornea, its attachment becomes more strict, and at the margin of that membrane it is inseparable from it. Its continuity is ascertained by dissection, but its tenuity and transparency are increased, and when held to the light it has a nearer resemblance to a very delicate lamella of the cornea than to the conjunctiva of the sclerotic. After maceration, the separation is more readily effected.

The character of this membrane is so materially modified by its several relations with the integument, the tarsi, the sclerotic, and the cornea, that its continuity alone establishes its identity. The fact of this continuity is, however, corroborated by some pathological phenomena, which so often illustrate problematical points in anatomy and physiology. For example, the conjunctiva furnishes the matrix for the adventitious vessels, which are created to repair breaches of the corneal texture*. These vessels, whether formed by the healing process, or opened by long continued diseased action, as in chronic ophthalmia, are obviously superficial. The circumstances by which they are produced, are characterized by

* Vide Tyrrel’s views respecting the organization of the cornea, and the source of the vessels for its supply.
different appearances, as I shall hereafter point out. Again, when a small portion of the conjunctiva is abraded by an extraneous particle, the scabrous surface of the cornea is exposed, and ulceration of this surface ensues. The deficiency of the conjunctiva is exactly depicted by the margin of the abrasure, and the contrast of the surfaces. This is very dissimilar to the interstitial ulcer of the cornea. The pterygium, a rare disease, exhibits the continuity in a very striking manner. It has a full broad base next the canthus, where the conjunctiva lies loose, and is gradually flattened and drawn to a point, so as to have a wedge-like form as it approaches the cornea. But although the deposition is beneath the conjunctiva, it does not stop at the cornea, but slowly travels across it. The strictness of this adhesion alters its appearance; the lymph, shed between the conjunctiva and cornea, presenting only a progressive dense opacity, instead of the fleshy elevation which it exhibits upon the sclerotic. The continuity of the superjacent texture is demonstrable.

The conjunctiva is closely adherent upon the tarsi, and although transparent, appears of a pale red tint; upon the sclerotic and cornea it is colourless. The sclerotic conjunctiva, however destitute of red vessels in the tranquil state of the organ, becomes conspicuously vascular and acquires a deep red colour by inflammation, its minutest capillaries appearing to convey red blood in the vehement acute ophthalmia. Those of the corneal conjunctiva are only to be seen when, by a continued distention, the connection is loosened between the conjunctiva and cornea. In this case, the cornea exhibits red vessels freely inosculating from its opposite sides, and anastomosing with each other. The increase in number and extent of these vessels is a gradual process, demonstrable to observation; and the inflammatory action which precedes this state is ordinarily of considerable duration. The incapacity of the vessels of the corneal conjunctiva to receive red blood, seems to depend upon the strictness of its adhesion.

The conjunctiva is attached to the canthi of the eyelids, and, at
the internal canthus, forms a semi-lunar duplicature in the shape of a valve. The horns of this crescentic fold are lost in the sinus palpebralis, or angular fold of the conjunctiva.

On the fore part of this valve, a small red glandular body, *caruncula lachrymalis*, is seen, occupying the hollow of the canthus. The caruncula is a granulated substance, of a conical form and a deep red colour. The base of the cone is next the orbit, the apex towards the eye. A few fine hairs are scattered over its surface. It is made up of a congeries of minute follicles, secreting that mucus which accumulates during sleep in the form of a gummy matter, at the inner corner of the eye; and appears to perform a similar office to that of the Meibomian glands, which are confined to the tarsi.

From the above description it will be understood, that the palpebra, the anterior hemisphere of the eyeball, and the lachrymal passages, are everywhere covered by the reflected integument, modified in its disposition and qualities as its economy requires, which invests the organs of sense, the hollow viscera, and forms the external covering of the body. It is by the continuity of this membrane that the sympathy is established between these surfaces, healthy and morbid, remote and contiguous, and that the diseases with which they are affected have for the most part a common character.

A superior and inferior branch, derived from the ophthalmic artery, at its egress from the orbit, course along the orbital edges of the tarsi, and form, by inosculcation at the external angle, a complete *arcus palpebralis*. An arterial arch is formed by the anastomosis, on the one side, of the *frontal* branch of the ophthalmic with the *angular*, on the other, it is completed by the union of the *supra-orbital* with the tempero-frontal. The superior coronary, transverse facial, infra-orbital and temporal artery, participate in the supply of the palpebrae.

The veins, beginning by small radicles from the opposite margins of the tarsi, form an intricate plexus beneath the skin of the palpebrae, and are collected into the facial, supra-orbital, and deep
temporal vein. The arteries pass in the direction of the orbicular fibres; the veins cross them at right angles; their direction varying according to the breadth of the palpebrae.

The nerves take a direction similar to the veins; the frontal branch of the fifth pair supplies the superciliary and superior palpebral branches; and the infra-orbital, or first branch of the superior maxillary nerve, gives off three principal branches, which turn round the trunk of the facial vein, to be dispersed upon the lower eyelid.

Thus far, the anatomical structure of the eyelids has been generally described; there remain some peculiarities which are now to be examined. The superior is broader than the inferior palpebra, covering two-thirds of the surface of the globe by its descent. It is also more moveable, the inferior palpebra being inconsiderably elevated to meet it in shutting the eye. The superior palpebra, when drawn up, makes a doubling or deep crescent-shaped fold in the skin under the orbitar arch, which is effaced when the palpebra falls. Upon the skin of the lower eyelid narrow and gently curved rugae are seen; these, which are signs of the unequal contractility of the skin and the muscular fibres beneath it, are more strongly marked in persons of advanced years, in whom the muscles have been longer and more rigorously employed, and whose skin is loose or redundant from the absorption of the adeps beneath it.*

The parts next in order that we have to examine are the **orbitar appendages.**

The walls of the orbit are lined by a process of the dura mater, which, passing out of the cranial cavity, gives a periosteal covering to the bones of the orbit, and becomes continuous at all its openings with the periostium of the head and face; hence the extensive sympathetic pains in inflammatory affections of the bones of the face and cranium, and their common membrane. Hence also probably the suppurative inflammation of the dura mater, after extensive fractures and injuries of the orbit.

* In old persons this is vulgarly called the crow's foot.
The fat, which in health is secreted abundantly in the orbit, surrounds the optic nerve, and invests the posterior surface and sides of the globe, forming for it a soft bed, to facilitate the revolutions of the eye, and likewise to defend the vessels and nerves from compression in its motions. In emaciating diseases its diminution by absorption produces that characteristic sinking of the globe in its socket, and loss of convexity in the eyelid, which is familiarly expressed by the term "hollow-eyed." On the other hand, its secretion in excess, as in morbid obesity, protrudes, compresses, and thus induces congestion in the vessels of the eye.

The muscles of the orbit are seven in number; viz., the levator palpebræ; the rectus superior, inferior, internus, and externus; obliquus superior and inferior.

The levator palpebræ is the highest muscle in the orbit; it arises narrow and tendinous from the upper edge of the foramen opticum, passes forwards and outwards beneath the frontal nerve, and becoming broader, bends down in front of the eye; it then ends in a dense cellular expansion, which is inserted into the superior border of the tarsal cartilage and into the superior palpebral sinus of the conjunctiva, behind the palpebral ligament. Use, to elevate and retract into the orbit the upper eyelid. From the nature and extent of its connection with the eyelid, it results that the partial division of the tarsal ligament, or even the removal of the cartilage, does not take away the power of elevating the lid, as the paralysis of this muscle does; the elevation, however, under these circumstances, is imperfectly performed.

The recti muscles are four in number:—the superior, or levator oculi; the inferior, or depressor oculi; the internal, or adductor oculi; and the external, or abductor oculi.

The rectus superior is broad, thin, and tendinous at its extremities, and fleshy in the rest of its extent: arising from the border of the foramen opticum and the partition between it and the foramen lacerum; inserted into the sclerotic, about a quarter of an inch behind the cornea. The superior surface of this muscle is
covered by the levator palpebræ; the inferior is placed upon the optic nerve, the ophthalmic artery, and the nasal branch of the ophthalmic nerve, anteriorly upon the eye itself. This muscle raises the eye.

The rectus inferior, similar in structure and figure to the preceding, arises from a ligament which in part surrounds the foramen opticum, and fills up the foramen lacerum; and is inserted, like the preceding, in the sclerotic. The inferior surface of this muscle is separated from the floor of the orbit by adipose tissue; the superior is in connection with the optic nerve, a branch of the third pair, and the eye. The action of this muscle is to draw the eye downwards, and consequently it is an antagonist to the superior.

The rectus internus is similar in its figure and origin to the preceding, and is inserted, on the inner side of the eye, into the sclerotic. The action of this muscle is to draw the eye towards the nose.

The rectus externus arises by two distinct heads; the inferior having a common origin with the rectus internus and inferior, from the ligament which occupies the inferior angle of the foramen lacerum; the superior from an arch of ligament crossing the foramen above. It is inserted into the outer part of the sclerotic coat. Its action is to roll the globe of the eye outwards. It is important to note this bicipital origin of the rectus externus, as some of the nerves of the orbit pass through the interspace between its heads, and others through the top of the foramen.

The ligament of the foramen sphenomaxillare forks into three intermuscular slips, which give origin and support to the external inferior, and internal recti muscles, in the manner of the intermuscular ligaments of the extremities.

The single actions of the recti are expressed by the terms levator, depressor, adductor, abductor. Their cooperation retracts the globe in its socket.

The superior oblique muscle, situated at the upper and inner
part of the orbit, arises at the upper and inner border of the foramen opticum, whence it proceeds forward along the os planum, and ends in a slender round tendon, which passes through a half ring of cartilage, that is attached by a ligament to the os frontis, a little above and behind its internal angular process. This *trocklea* is provided with a sacculus mucosus, and the tendon emerging from it is inclosed in a ligamentous sheath; this tendon is then reflected backwards, outwards, and downwards, between the superior rectus and the eye, and then becoming broad and thin, is inserted into the sclerotic coat between the superior and external recti; about midway between the entrance of the optic nerve and the insertion of the superior rectus. The action of this muscle is to draw the eye forwards and inwards, also to rotate it, so as to direct the cornea downwards and inwards towards the tip of the nose. Some authors consider it a rotator outwards.

The *inferior oblique*, situated at the inferior and anterior part of the orbit, arises tendinous from the orbital edge of the superior maxillary bone, above the infra-orbital foramen, and external to the lachrymal sac; it ascends obliquely outwards and backwards, below the inferior rectus, and is inserted by a tendinous expansion into the sclerotic coat, behind the transverse axis of the eye, and between the sclerotic coat and the external rectus. Its action is to draw the globe forwards and inwards, and to rotate it upwards and outwards. The two *oblique* muscles acting together draw the eye forwards and inwards, consequently they are antagonists to the *recti*.

The *arteries* of the eye are principally derived from the ophthalmic artery, which arises from the internal carotid, close to the anterior clinoid process, passes forwards through the optic foramen, below the optic nerve and external to it; in the orbit it rises above this nerve, and twines round it to the inner side of this cavity, along which it passes to the inner canthus, where it terminates. The branches it gives off in its course are, while on the outer side of the nerve,
1st. The lachrymal passes along the external rectus muscle, and supplies the lachrymal gland, and the external part of the palpebrae.

2d. Centralis retinae, very small, it pierces the sheath of the optic nerve, passes along the centre of the latter into the eye, where it divides into delicate ramifications; these spread along the internal layer of the retina, one or two pierce the vitreous humour, and extend to the capsule of the lens.

The branches given off by the ophthalmic artery above the optic nerve, are,—

3d. The supra-orbital, which passes forward along the levator palpebræ, and through the superciliary notch, supplies the muscles and integuments of the eyebrow, and ascending on the forehead divides into several branches, which are distributed to the scalp, and communicate with the temporal and occipital arteries.

4th. The posterior ciliary, ten or twelve in number, are very small, they surround the optic nerve, and pierce the back part of the sclerotic; pass between it and the choroid, and are distributed to the latter; some of their branches continue as far as the ciliary processes and the iris.

5th. Long ciliary, one on each side; they pass horizontally forwards, between the sclerotic and choroid membranes, as far as the ciliary circle; here they divide, and form a circular inosculations round the circumference of the iris; from this several branches radiate inwards, and again unite in a circle near the pupil.

6th. Muscular arteries, to the different muscles in the orbit.

The branches given off by the ophthalmic artery in its course along the inside of the optic nerve, are,—

7th. Ethmoidal arteries, they pass through the posterior orbit foramen to the mucous membrane in the æthmoid cells.

8th. Superior and inferior palpebral arteries to the palpebrae, caruncula, conjunctiva, and lachrymal sac.
9th. *Nasal,* passes beneath the trochlea, along the side of the nose, and inosculates with the angular artery.

10th. *Frontal,* which ascends to the eyebrow and forehead.

The veins of the orbit correspond to the arteries, and are all collected into the ophthalmic vein in its passage through the orbit. It takes a serpentine course over the optic nerve, through the foramen lacerum, to terminate in the anterior part of the cavernous sinus of the dura mater.

The *nerves* of the orbit are the *optic nerve*; the third pair, or *motor oculorum*; the fourth, or *pathetici*; the *ophthalmic division* of the fifth; and the sixth, or *abducentes*.

Each optic nerve, on passing through the optic foramen, becomes surrounded by a strong sheath derived from the dura mater; the four recti muscles next surround it, from the fleshy portions of which it is separated by a considerable quantity of soft fat, in which several nerves and vessels are lodged; from the optic foramen this nerve proceeds forwards and a little inwards, so as to be slightly curved, the convexity outwards; at the back part of the eye, it is very much constricted; it then pierces the sclerotic and choroid membranes, and terminates in the retina. In addition to the dura mater, this nerve possesses a very dense neurilema, which sends in numerous processes to form small canals or tubes in which the nervous substance is contained, so that this nerve is not composed, like other nerves, of several filaments placed parallel to each other; if the white substance be removed by maceration in an alkali, its cellular structure will become obvious.

In the cavernous sinus at the side of the body of the sphenoid bone, the four nerves of the orbit are arranged in their numerical order, viz. most superiorly the third pair, then the fourth, next the ophthalmic division of the fifth pair, and most inferiorly the sixth or abducentes nerve; in this part of their course, they are so closely united together, that they are sometimes called the *orbitar plexus*; when, however, they arrive at the anterior clinoid process, they separate, and as they enter the foramen lacerum orbi-
tale, their arrangement is as follows:—most superiorly the fourth, then the frontal branch of the ophthalmic, next the superior division of the third, external to which, and near to the outer wall of the orbit is the lacrymal branch of the ophthalmic, after these the nasal nerve, below which is the inferior division of the third, and lastly, lying inferior to them all is the sixth, holding the same relation to them as at the cavernous sinus.

The third pair enter the orbit in company with the nasal branch of the fifth and sixth pair, and divides into two branches. Its superior or lesser branch divides into two branches, the smaller and shorter one of which supplies the superior rectus, the other the levator palpebræ muscle. The inferior or larger branch passes below and to the outside of the optic nerve, and divides into three branches; the internal is the largest, it passes obliquely downwards, forwards, and inwards, beneath the optic nerve, and getting to its internal side is distributed to the internal rectus; the middle supplies the inferior rectus; and the external, which is the longest, passes downwards and forwards on the surface of the inferior rectus, between it and the globe of the eye, (it gives off no filaments to this muscle,) and is lost in the inferior oblique muscle; besides these branches, the inferior division of the third pair gives off from its root a small short filament to the ophthalmic ganglion. All the branches of the third pair are distributed to the ocular surface of the muscles.

The fourth pair, called also trochleator or patheticus, enters the orbit by the foramen lacerum, ascends obliquely forwards and inwards above the levator palpebræ and the superior rectus, and is distributed by four or five fine branches to the upper surface of the superior oblique muscle: as this delicate nerve is passing along the outer side of the cavernous sinus, it lies between the third pair and the ophthalmic branch of the fifth, below the former and above the latter and the sixth; as it enters the orbit it mounts above the third and fifth; and is therefore the highest nerve in the orbit, both it and the frontal being immediately beneath the periosteum; previous to entering the oblique muscle,
its size is somewhat increased. It is remarkable that this nerve detaches an extremely minute branch, at its entrance into the cavernous sinus, which passes in a retrograde direction into the tentorium,—discovered by Arnold.

The fifth pair, or trigemini, having formed—by its sensitive to the exclusion of its motor portion—the semi-lunar or gasserian ganglion, divides into three branches; the ophthalmic, the superior and inferior maxillary nerves.

The ophthalmic nerve passes along the outer side of the cavernous sinus below the third and fourth, and above the sixth; in this situation it receives some filaments from the sympathetic nerve; as it approaches the foramen lacerum orbitale, it divides into three branches, the lachrymal, frontal, and nasal.

The lachrymal nerve, the smallest of the three, receiving a filament from the fourth in the cavernous sinus, passes forwards and outwards to the lachrymal gland, above the external rectus muscle; in this course it is surrounded by fat and accompanied by the lachrymal artery; it gives off two small branches, one through the sphen-maxillary fissure, to communicate with the superior maxillary nerve, and the other through the malar bone, to communicate with the facial nerve; it then enlarges, sends four or five branches to the inferior surface of the lachrymal gland, and terminates in several fine soft filaments on the conjunctiva, lining the superior palpebrae, and the cellular membrane between the gland and malar bone.

The frontal nerve enters the orbit, mounting above the levator palpebrae, on which it is conducted towards the supra-orbital foramen along with the fourth, but inferior and external to it; it passes forwards in a kind of groove on the upper surface of the levator palpebrae muscle; and near the superciliary arch it divides into two branches, an external and internal.—The internal or supra-trochleator nerve, is the smaller branch, and runs forwards and inwards above the trochlea of the superior oblique muscle, and is distributed to the corrugator supercili, orbicularis palpebrarum, and occipito-frontalis muscles, also to the integu-
ments of the forehead and superior eyelid; it communicates with the nasal nerve, and sends one or two small filaments into the frontal sinus.—The external branch, called also the supra-orbital or the proper frontal nerve, from its size and direction, appears to be the continuation of the original trunk; it passes through the superciliary notch or foramen, ascends on the forehead, divides into two branches, which subdivide into numerous filaments; these chiefly ascend in the muscles and integuments of the scalp, many of them take a very long course, and communicate with the portio dura, with the occipital nerves, and with those from the opposite side. The ophthalmic nerve gives no filaments to the muscles of the orbit.

The nasal nerve separates from the frontal, behind the orbit, enters this cavity beneath that branch, and between the two heads of the external rectus, it then runs, in company with the ophthalmic artery, obliquely forwards and inwards above the optic nerve, and below the superior rectus muscle, and continues its course along the inner side of the orbit, below the superior oblique muscle, and then divides into branches, the external or infra-trochleator nerve, and the internal or proper nasal nerve. Before it enters the orbit, the nasal nerve frequently receives a filament from the sympathetic nerve; just as it enters the orbit, and on the outer side of the optic nerve, it gives off a delicate filament, about an inch in length, which runs along the outer side of the optic nerve to the lenticular ganglion; as the nasal nerve passes over the optic, it gives off two ciliary nerves. The external or infra-trochleator nerve passes out of the orbit, beneath the trochlea of the superior oblique muscle, and is distributed to the lachrymal passages and dorsum of the nose. The internal, or proper nasal nerve, re-enters the cranium by the anterior internal orbitary foramen, and from thence again passes down through one of the perforations of the cribiform plate of the æthmoid bone, where it divides into two branches, of which one is exclusively distributed to the mucous membrane, near the anterior opening of the nares, the other passing out between the fibro-cartilages,
is devoted to the integument at the extremity of the nose,—more commonly and modernly called "lenticular."

The sixth or abducens nerve, after traversing the cavernous sinus, where it is joined by branches from the sympathetic nerve, on the other side of the carotid artery, enters the orbit through the lower part of the foramen lacerum, between the origins of the external rectus beneath the other orbital nerves, and above the ophthalmic vein; it then passes forwards and outwards, and is distributed to the ocular surface of the external rectus muscle.

The ophthalmic ganglion is a small body situate near the back part of the orbit, between the optic nerve and external rectus muscle; it is of a reddish colour, and surrounded by soft fat; its posterior superior angle receives the filament before mentioned from the nasal branch of the ophthalmic, and its posterior inferior angle receives the twig from the inferior oblique branch of the third pair; these two nerves are described by some as forming this ganglion; there is likewise a long filament, which passes backwards to the cavernous sinus, and communicates with the carotid plexus; from the anterior angles of this ganglion two fasciculi of fine nerves proceed, termed the ciliary; the inferior fasciculus is larger than the superior; the ciliary nerves are about twenty in number, eight or ten in the inferior fasciculus, about six in the superior, and three or four internally, which arise from the nasal nerve; the ciliary nerves twine along the surface of the optic nerve, accompanied by the ciliary arteries, and pierce the back part of the sclerotic coat, they then become flat, and proceed forward in parallel grooves on the inner surface of that membrane, with very little connexion, to the choroid coat; at the anterior part of the eye they meet the ciliary ligament; in this substance most of these nerves are lost, hence some consider this as a ganglion; on each side, however, one or two branches may be traced through this into the iris, in which they divide into numerous filaments of extreme minuteness.

The functions of the nerves of the orbit are as follow:—
optic nerve is specially destined for vision, the third, fourth, and sixth are for communicating motion to the muscles of the orbit, and the ophthalmic branch of the fifth pair is for communicating sensation to the parts within and around the orbit; the office of the lenticular ganglion will more properly come under consideration hereafter.

The *lachrymal gland* is situated within the orbit, at its upper and outer part, beneath the fossa in the orbitar plate of the frontal bone, and behind its external angular process. It is about the size of a small almond, and will readily be discovered, either by dividing the integuments of the upper eyelid, and then dissecting towards the cavity of the orbit, between the upper tarsus and the supra-orbitary ridge, or by dividing the conjunctiva uniting the upper tarsus to the eye, and then drawing the eye a little forwards. This gland is a yellowish white body, of an oval flattened figure, divided by a cleft into two lobes, of which the superior and internal is the smaller and thinner, the inferior and external the large extremity of the gland. Its position is oblique; the inferior and internal surface hollowed to suit the convexity of the globe; the superior convex, to suit the corresponding concavity of the orbit, to which the gland is attached by a ligament passing transversely beneath it. It measures in length about ten lines; in breadth five or six. In structure it is conglomerate, consisting of numerous small granular portions, or lobules, connected together by dense cellular tissue, upon which its vessels and nerves ramify, to supply the granules of which it is composed. The vessels enter the gland posteriorly, and from the anterior margin, its ducts, five or six in number, pass out in straight lines, and pierce the conjunctiva at the orbitar edge of the superior tarsus.

Having now examined the structures of the facial and orbital appendages, let us next proceed to the investigation of the anatomy of
The eye is situated at the anterior and internal part of the orbit, behind the conjunctiva, surrounded by muscles and fat, and connected anteriorly to the eyelids by the conjunctiva, posteriorly retained in its place by means of the optic nerve.

The size of the eye varies but little in different individuals. The apparent difference arises either from the difference in the degree of projection of the eye in different individuals, a circumstance which is determined by the relative volume of the ball and its socket; or from variations in the form of the eyelids, and in the diameter of the opening between them. When this opening is wide, a large extent of the eye is exposed, and the whole organ seems to be large and project forwards. The small size of the opening between the lids produces the opposite impression. When paralysis affects the palpebral muscle of one eye, the organ, compared with its fellow, has the appearance of being diminished in bulk.

The eye of the female is commonly smaller than that of the male; and the fissure of the eyelids, which are rounder, broader, and more delicate in texture, is generally less.

The figure of the eye is such that it represents portions of two spheres of different diameters. The posterior four-fifths of the organ is the larger sphere, while the anterior fifth is a section of a smaller sphere. The eye, therefore, is not exactly spherical, the antero-posterior, or visual axis, which is nearly an inch, being about one or two lines greater than the transverse or vertical axis. The visual line is parallel in the two eyes.

The eye is composed of fluids or humours enclosed in different membranes; these membranes are,—

1st. The cornea.
2d. The sclerotic.
3d. The iris.
4th. The choroid and its appendages, the annulus and processus ciliari.

5th. The retina.

The fluids are,—

6th. The aqueous humour.

7th. The crystalline humour.

8th. The vitreous humour.

The cornea is the anterior transparent membrane which first converges the rays of light.

The sclerotic is the external fibrous opaque investiture of the choroid.

The iris is the coloured membrane in which the aperture termed 'the pupil' is formed.

The choroid is the vascular membrane of the eye, and the dark screen which confines and condenses the rays of light. Its appendages are auxiliary to this purpose, and to other parts of the economy of vision.

The retina, or nervous coat, is the membranous expansion of the optic nerve, upon which the images of external objects are painted.

The humours give shape to the eyeball, and support its tunics.

The crystalline is set in the vitreous humour, and washed in front by the aqueous humour.

The _sclerotic coat_ is the external covering of the eyeball, with the exception of one-fifth part, bearing a proportion to the cornea somewhat similar to that which the vitreous bears to the aqueous humour. It is a strong, opaque, fibrous membrane, extending from the optic nerve to the cornea, which preserves the globular figure of the eye, defends its more delicate internal structures, and serves as a point of insertion for those muscles which move the eye. About a line internal to its centre posteriorly, it is perforated by the optic nerve; this is a small conical aperture, which appears traversed by fibres, so as to present a cribriform appearance; it is doubtful, however, whether this indistinct appearance may not partly depend on the central vein and artery of the retina, which
accompany the nerve through this opening, termed the 'porus opticus;' the sheath of the optic nerve is continuous with this membrane. Anteriorly it receives the cornea, and is so intimately connected with it, that maceration alone can separate them; both are sloped off obliquely as well as slightly grooved; the sclerotic overlaps the cornea, and their connexion is still further secured by the conjunctiva externally, and by the membrane of the aqueous humour internally. The sclerotic, around the entrance of the optic nerve, and likewise around the margin of the cornea, has many small oblique passages, of which the apertures on its internal surface are conspicuous when separated from the choroid, for the entrance and exit of the ciliary vessels and nerves. In structure it is dense and fibrous, these fibres presenting, on maceration, a reticulated appearance: it has few nutrient vessels, and no traceable nerves; its texture is both extensile and elastic. In the foetus and infant it admits of separation into two plates or layers, but these are inseparably connected in the adult. Externally, the sclerotic is of a blueish-white colour, and rough. Internally, it is smooth and glistening; it has also furrows in right lines, in which the long ciliary vessels and nerves are lodged. Throughout the greater part of their extent, the sclerotic and choroid coats are loosely connected together through the medium of blood vessels and cellular tissue; but around the opening through which the optic nerve passes, the union between these two membranes is more firm. The density of the sclerotic is not uniform; a vertical section of this membrane from behind forwards, will show its greatest density to be posteriorly near the optic nerve, where it is about a line in thickness, and it becomes gradually thinner towards its front margin, where it is again strengthened by the tendinous expansion of the recti muscles. Its thickness varies a little in different persons; being occasionally so thin immediately around the cornea, as to permit the blackness of the choroid to be seen through it.

The cornea forms the anterior fifth of the external membranous covering of the eye; it is nearly circular, its transverse diameter being a little greater than its vertical. The anterior or convex
surface is covered by a fine and closely adhering membrane, which, though generally considered a continuation of the conjunctiva, is very different from it in its structure and properties. The posterior or concave surface of the cornea is lined by a fine elastic membrane, which, by some, is described as a part of the membrane of the aqueous humour; it is however a membrane *sui generis*; it is best seen in the eye of the horse which has been macerated for some days; the external laminæ, which are now opaque, can be peeled off, leaving behind it this elastic cornea, which preserves its proper curve and transparency; if it be cut, it will curl up in itself, thus exhibiting true elastic cartilaginous properties. The structure of the cornea is horny, less extensile than the sclerotic, and perfectly transparent. It is onion-like, composed of concentric lamellæ or pellicles, connected by a delicate cellular tissue containing a transparent fluid, in which exhalant and absorbent vessels are abundantly distributed. This tissue is more lax or copious between the anterior than between the posterior lamellæ. The transparent conjunctiva upon the cornea, gives a polish and brilliancy to the surface, which the lamellæ of the cornea do not possess, and which is lost at the approach of death, by the transudation of the aqueous humour. They are scabrous from the adhesion of the cellular membrane connecting them, and void of lustre.

The cornea is of greater thickness than the sclerotic in infants, in whom its posterior surface is contiguous to the iris. The internal surface is likewise half a line broader than the outer, the margin being obliquely extended from without inwards, to correspond with the sloped edge of the sclerotic. After maceration, it may be detached from the sclerotic, to which it is connected by cellular tissue; this separation is most readily effected by plunging the macerated eye into boiling water *. A fine transparent humour is secreted by colourless exhalants in the areolæ of the cellular membrane between the lamellæ of the cornea. The interstitial

* Dr. Jacob has proved that the union between the sclerotic and cornea consists of an intermingling of fibres, and sloped off, which is ordinarily described.
substance of the cornea receives no coloured vessels. Numerous lines have been observed to form figures of many sides between the plates of the cornea in the eye of the negro, and supposed, from a reddish tinge, to be blood-vessels. The existence of nerves has never been demonstrated, and it is much to be doubted if it possess any. The convexity of the cornea is greater than that of the sclerotic, being the segment of a sphere seven lines and a half only in diameter.

The next membrane we have to examine is the choroid, which is exposed in the following manner: fix the eye in a small shallow vessel, which can be readily immersed under water, carefully raise a small portion of the sclerotic, pass in some air between it and the choroid, these membranes can thus be readily separated; then dissect off the sclerotic under water; this tunic can be readily detached as far as the cornea, here it adheres to the ciliary ligament; this connexion may be separated with the handle of the knife, the cornea or one half of it, may also be removed with the sclerotic, and the next tunic of the eye will be exposed, the choroid, with its appendages, the ciliary ligament, ciliary processes, and iris.

The choroid membrane extends from the circumference of the optic nerve to the margin of the exterior or flattened surface of the vitreous humour; there it terminates, together with the retina, in a greyish coloured substance termed ganglion, or ligamentum ciliare, or better, annulus ciliaris, and which is the common centre of union for the interior membranes of the eye.

The external surface of the choroid is of a dusky brown colour in the adult, reddish in infants, and adhering by an abundant and lax cellular tissue, which may be readily inflated, to the sclerotic coat, and by the numerous ciliary vessels and nerves which perforate the latter to take their course upon the choroid. This cellular substance is more plentiful in the infant than the adult, and is most abundant in the track of the principal vessels and nerves. The vessels terminating upon it are extremely numerous, and secrete a dark pigment, or varnish, which stains the contiguous adhering surface of the sclerotic; it likewise com-
municates its stain to the fingers, or a piece of white paper, but the texture of the membrane is permanently dark, and is not bleached by maceration.

The internal surface of the choroid is also covered with a black varnish, thicker and deeper coloured in the infant than in the adult; but having no connexion by texture to the retina, its stain is not communicated to that membrane. Around the insertion of the optic nerve, the choroid is destitute of this dye. Immersion for some time in alcohol discovers a fine white flocculent substance coating the interior of the choroid, formerly described by Ruysch as a distinct membrane, (tunica Ruyschiana,) but not regarded in this light by modern anatomists. The pigment, there can be no doubt, is secreted into a fine cellular tissue, flakes of which are detached in some diseased states of the organ, from the ciliary processes and back part of the iris, forming to all appearance a real membrana nigra.

The ciliary nerves run in parallel lines, at equal distances, upon the choroid; and from their equal size and whiteness are particularly conspicuous. The long ciliary arteries appear, one on either side of the globe, in their course to the annulus ciliaris. Beneath these the membrane presents, on its opposite sides, vessels arranged in the form of trees with weeping branches, or of the figure of a jet d'eau; these, which have been named vasa vorticosa, are veins returning the blood distributed to the ciliary processes, and are collected into three or four distinct venous trunks. The short posterior ciliary arteries pass under the ciliary veins, in the intervals of the trunks, to the interior of the choroid; and uniting with the anterior at the fore part of the globe, their extremities form a very intricate and beautiful net-work upon its interior surface. The adhesion of the choroid to the sclerotic is most strict, adjacent to the optic nerve posteriorly, and the ciliary ring anteriorly, owing to the introduction of the ciliary vessels at these parts. This membrane is more dense anteriorly than posteriorly.

The ciliary ring or ligament, is an elastic ring, composed of a short and dense pulpy texture, closely adherent to the inner border
of the sclerotic, at the distance of a line and a half from the external circumference of the cornea. It is of greater breadth on the temporal than on the nasal side. The choroid and retina adjoin its greater, the cornea and iris its lesser circumference. Anteriorly it adheres firmly to the sclerotic, as before observed, and the ciliary processes are attached to its posterior surface, so that it forms a common centre of union for these tunics. Its colour is observed to correspond to that of the iris.

On the internal surface of the choroid, at the root of the ciliary ligament, the plicæ or processus ciliares arise in delicate striae, and advancing a little anterior to the circumference of the crystalline lens, terminate in a circle of fine grey points at the base of the iris. They appear to be radiated folds of the choroid coat, from sixty to seventy in number, long and short alternately, and gathered at their origin like the plaits of a shirt at the wristband. Viewed collectively through the vitreous humour, they have some resemblance to a radiated flower; a small white circle appears within a large dark one. The white lines represent the edges of the plicæ; the black, their interstices coated with pigment. These edges of the plicæ are engrooved in the duplicature of the vitreous capsule, which assists in forming the canal of Petit.

The extremities of the processes projecting from the interior border of the annulus ciliaris interdigitate with the radical fibres of the iris. To obtain a view of them, let the cornea be accurately removed at its junction with the sclerotic, and the iris be torn away, entire, from its ciliary attachment. The points of the processes will then appear, projecting like the teeth of a comb from behind the annulus ciliaris; and the ciliary border of the iris, upon floating it in water, will be found to present a corresponding arrangement.

The processes having their edges thus inlaid in the tunica hyaloidea at the margin of the crystalline fossa, and their points or anterior extremities interlaced with the radicle fibres of the iris, form a posterior iris, the aperture of which is nearly occupied by the crystalline lens and its capsule; there is a small interval of
transparent membrane between the circumference of the lens, and the termination of the ciliary processes. From their origin to their insertion, they are supported exteriorly by the annulus ciliaris, with which substance they are in fact incorporated. The figure of each plica ciliaris is triangular, the internal obtuse angle being opposed to the circumference of the crystalline lens; the posterior, elongated, loses itself in the choroid; the anterior is inserted into the iris. The anterior edge is attached to the annulus ciliaris and root of the iris, the posterior to the tunica hyaloidea, and the internal and shortest measures, the space between the verge of the crystalline lens and the basis of the iris; or, in other words, forms the outer boundary of the posterior chamber.

The iris is a delicate, circular, coloured membrane, which presents a plane surface traversing the globe vertically, and dividing the corneal from the sclerotic segment. It is rendered imperfect as a septum by the pupilla or round hole in its centre. The pupil is not, however, quite central in relation to the iris, the breadth of the iris being always somewhat less on the nasal than on the temporal side. It is divided into a ciliary and pupillary portion. Its attachment is, as already observed, by indenture with the extremities of the plicae choroideæ, at the inner margin of the annulus ciliaris, from which it originates. The ciliary portion of the iris is the larger one, and is composed of a delicate fibrous and vascular tissue, in which grey serpentine lines or striae are seen proceeding like radii from the ciliary ligament; from this the smaller pupillary portion is distinguished by a darker shade of colour, and a gently elevated circular line, most conspicuous on the posterior surface of the membrane. The fibres of this portion of the iris have a similar tortuous direction, and are convergent towards the pupillar aperture. The pupillary margin is thin and defined, and presents the appearance of a dark circular line when placed upon a white ground, as e. g. the opaque capsule of the crystalline lens. The iris diminishes in thickness from its base to the margin of the pupil. Its anterior surface is richly coloured of different hues in different individuals. It is thickly coated on
its posterior surface by the pigmentum nigrum, which is here called uvea.

The ciliary vessels, entering the anterior part of the globe, unite with the other detachments, and form arches at the base of the iris and processes. From the zone thus produced, (zona major,) the branches run in straight lines upon the iris. In the dilated state of the pupil these radiated vessels are tortuous; by its contraction they become straight. At the distance of rather less than half its diameter from the pupil, another zone is formed by their anastomosis, from which branches are detached to the margin of the pupil. The zona minor gives the appearance of the undulating circular line, distinguishing the pupillary from the ciliary portion of the membrane. The two long ciliary arteries chiefly contribute to the formation of these zones, and the supply of the iris. The short ciliaries, seen upon the interior of the choroid, detach numerous fasciculi to each ciliary process, which pursue a serpentine course along the fixed edge of the fold, and are inverted to form concentric arches upon its opposite free margin. The nerves which supply the iris, are branches derived from the lenticular ganglion, and nasal nerve.

There is a delicate vascular, which has received the name of membrana pupillaris, that closes the pupil in the foetus, and is ruptured, either at birth, or a short time previous.

Of the peculiar structure of the ciliary ligament nothing certain is known. The notion that it wholly consists of vascular and nervous tissue, having no proper fibrous texture for its base, which has also been conceived of the iris, is absurdly contrary to observation and analogy. The ciliary ligament appears to be a gangliform or bulbous termination of the choroid coat, and the ciliary processes resemble plaits or doublings of this membrane laid back to back, to accommodate it to the area of the posterior chamber.

Similar uncertainty prevails as to the structure of the iris, the different opinions of its texture being founded rather upon inference from its functions than upon demonstration. If the for-
mer species of evidence be regarded, it is muscular, and accordingly, some anatomists consider it as consisting of two sets of muscular fibres, one *concentric* round the pupil, composed of circular fibres contracting the pupil in the manner of a *sphincter*; the other *radiated*, and having by its muscular action the power of contracting the iris from the centre to the circumference, and consequently enlarging the pupil. Others, again, conceive that the phenomena of its action can be best explained on the supposition that it is both muscular and elastic, and that these forces act alternately.

The *retina*, or delicate membranous expansion of the optic nerve, is situated between the choroid membrane and vitreous humour. It is best exposed by gently tearing off the choroid, the eye being held under water, and then placing an inverted globe filled with clear diluted spirits over the dissection; the retina will become slightly opaque, and have a magnified appearance. The optic nerve having perforated the sclerotic and choroid coats at the internal and posterior parts of the globe, terminates abruptly in a little white conical eminence or papilla. From the base of this papilla proceeds the very delicate membranous expansion termed *retina*. It encompasses the vitreous humour, the front part only excepted; where, within about two lines of the lens, the nervous matter terminates by an abrupt line, along which a small blood-vessel runs. It is of exceeding delicacy, and on dissection resembles, in semitransparency and in colour, the ground glass of which ornamental lamps are made. During life it is perfectly transparent. Without caution it cannot be preserved entire in dissection; and if, when the sclerotic and choroid coats are divided, the parts of the globe are separated by their weight, by its strict adhesion to the other coats at its origin, it is drawn off the vitreous tunic in the form of a fine medullary rope, which expands and reassumes its proper form in water. The retina is divisible into three layers; first, *lamina serosa*, or Jacob's membrane, so called from its discoverer, Dr. Jacob, of Dublin, an extremely delicate serous layer, which may be sepa-
rated from the external surface of the retina by gentle pressure with the handle of the knife, under water; second, lamina nervosa, which is soft and grey, and continuous with the optic nerve; and third, lamina vasculosa, which is very delicate, lies on the vitreous humour, and is continued on its fore part to the capsule of the lens, where it becomes adherent to the hyaloid membrane. Dissect off the posterior half of the retina from the vitreous humour, or cut transversely a fresh eye, and allow the humours to escape, then look on the concave surface of the retina, and we may observe in the centre of the optic nerve a small dark point, the porus opticus; this is the central artery of the retina, which then spreads its branches on the internal surface of the retina, in the lamina vasculosa; about two lines external to this, and in the axis of the eye, is a small yellow or orange spot, the punctum aureum; the retina is thrown into folds around this. Some describe a perforation and deficiency of the retina at this point, under the name of foramen centrale; it rather appears to depend on some peculiar organization. The external surface of the retina is opposed to the choroid, the internal to the tunica hyaloidea.*

The name of anterior chamber is given to that space comprised between the cornea and iris, ordinarily about one line and a half in depth. The posterior chamber, not exceeding a quarter of a line, is the space between the iris and the crystalline lens. They communicate by the pupil, and both are occupied by the aqueous humour. The aqueous humour is about five grains in quantity, perfectly transparent, having a specific gravity somewhat greater than that of water; it evaporates on exposure to heat, and is uncoagulable by heat, acids, or alkalies; its taste is viscous and slightly saline; in foetuses and new-born infants, it is turbid, and sometimes of a reddish colour. It gives figure and tension to the cornea, keeps the pupil properly diluted, and supports the

* See Müller for the mode in which the fibrillæ of the retina terminate.
parts forming the parietes of both chambers. When discharged by the puncture of the cornea, the pupil contracts, and the chambers are obliterated by the collapse of their parietes; it is, however, reproduced in a few hours.

The vitreous humour is the basis upon which the larger tunics of the eye are expanded, and fills a space somewhat exceeding two thirds of the globe of the eye. Upon its anterior surface, it is flattened rather abruptly, and presents a central cup-like depression, the dimensions of which exactly correspond to the posterior segment of the crystalline humour, which is embedded in it. It is a soft, gelatinous, and transparent body, consisting of a thin glairy fluid, heavier than water, perfectly pellucid, and contained in cells formed by processes of a delicate membrane, called hyaloid, arranged in horizontal planes. Towards the back and sides of the humour these cells are larger than in the interior, adjacent to the crystalline fossula; the septa are likewise thicker and stronger towards the circumference of the humour. After a careful section of the frozen humour, its substance may be picked out in solid wedge-like flakes from the interstices of the septa. The continuous covering, though of great tensility and perfect transparency, is of much strength, and resists, (owing to the support it receives from the numerous septa internally,) a considerable pressure. When lacerated or wounded, the humour of the corresponding cell or interstice is instantly evacuated; but if the wound is superficial, the humour does not escape in quantity, while supported by the other parts of the globe, or if removed from the globe, while suspended in water. But if in any way compressed after a wound, a dribbling of the humour goes on slowly, until the cells, which communicate with each other, are emptied.

The tunica hyaloidea is covered by the retina in the whole extent of that membrane, but is connected with it only at the entrance of the optic nerve. The substance of the humour is penetrated by a branch of the arteria centralis retinae, which contri-
butes a few very delicate vessels to its containing membrane. In the foetus they have been displayed ramifying on the capsule at the back of the lens.

The crystalline humour is a transparent double convex lens, situated on the fore part of the vitreous humour, behind the anterior third of the eye, and a little nearer to its nasal than its temporal side. Its axis corresponds to that of the pupil, a little to the inner side of the axis of the eye. It measures in breadth about four lines, in thickness about two. The most convex or posterior face of the lens, is exactly fitted to the cup in the fore part of the vitreous humour; the anterior is opposed to the iris, and the circumference to the canal of Petit. It is surrounded by a proper capsule, which is thin and soft posteriorly, but anteriorly dense and peculiarly elastic. A small quantity of fluid contained in the capsule inclosing the crystalline humour, is called after its discoverer, humor Morgagni. The lens is retained in its place by the hyaloid membrane, which splits into two laminae at its border; these laminae pass, one posterior to the lens, the other before it, and become connected to the proper capsule; a small triangular canal is formed between these layers, called the canal of Petit, the base of which is formed by the circumference of the lens. Inflation of this canal shews that it is not of uniform dimensions; like the large intestine, it is tacked up into cells or pouches by short transverse septa, whence the name given by Petit, canal gauderonné, or godronne. In the grooves corresponding to these septa, the posterior edges of the ciliary processes are inserted. The intervening looser portions of the membrane correspond to the interstices of the processes; and the black radiated lines, which appear upon the membrane of the canal, are stains left by the pigment which fills them. Like the ciliary ligament, the canal is broader on the temporal than the nasal side. This humour is perfectly transparent in a healthy state. In the foetus and new-born infant, it is spherical, semi-fluid, and has a slightly reddish tint. In the adult, it is gelatinous in consistency, its external lamellae easily broken down between
the fingers, but a nucleus of greater firmness is formed in the centre, which in some degree resists this pressure. In advanced age, the lens becomes more close and compact in texture, and the nucleus acquires a yellow or topaz colour.

The texture of the lens is lamellated; the lamellae concentric and connected by a very delicate fibrous tissue. After maceration, the crystalline lens breaks into triangular pieces, composed of concentric scales, of which the apices meet in the centre. The anterior may sometimes be separated from the posterior part of the lens, at the line of its circumference, as if it were composed of two segments of spheres of unequal size, applied face to face. The crystalline lens discovers no vascular organization.

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PHYSIOLOGY OF THE EYE,

AND

ITS APPENDAGES.

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Though an examination of the phenomena of vision, and the laws which regulate it, may be considered by many as a subject more allied to philosophy than medicine, yet as the description of the structure of an organ would necessarily be incomplete, without at the same time giving an account of its functions, so on that account, would the preceding description of the structure of the apparatus of vision, be incomplete, were I to omit a description of the physiology of vision; and the history of its disease would want the illustration which a competent knowledge of its economy conveys.

In entering into the investigation of the functions of an organ, which is acknowledged by all to be the most perfect of optical
instruments, it is clearly necessary to bring to the investigation a considerable share of knowledge, concerning the laws of optics, and although the greater number will doubtless be in possession of that information beforehand, it may not be out of place to point out briefly the general laws of optics, and more especially those which bear directly on the subject under consideration.

The expansion of the optic nerve, or the retina, which is disposed as a cup at the posterior part of the eyeball, has the wonderful property of communicating to us sensations of colour, when adequate impressions are made upon it. A blow upon the eye causes it to appear to flash fire; and pressure on the side of the eyeball excites a sensation of coloured circles. The impressions by which we see, although of an incomparably more delicate nature than the preceding, yet, like them, are mechanical impulses upon the retina. They are produced by Light.

Light consists either of imponderable and infinitely minute material particles emitted from luminous bodies, or of undulations of an ethereal medium, supposed to pervade all space. A succession of particles on the one theory, or of undulations on the other, constitutes a ray of light. Rays of light move only in straight lines: their velocity is so great, that they travel from the sun to the earth, a distance of 95,000,000 miles, in 8½ minutes. Light, therefore, is an intermediate agent, through which bodies make a mechanical impression on the retina.

Light, emanating from luminous bodies, forms diverging cones, which, if they met with no obstruction, would be prolonged indefinitely. Hence it has been concluded, that the intensity of light in any place, is in the inverse ratio of the square of the distance of the luminous body from which it emanates.

According to the different properties which bodies exhibit in regard to light, they have been classified into luminous, opaque, and transparent. A luminous body is one that shines by its own light, as the sun, a fire, a candle, and so forth. But all bodies that shine are not luminous; polished metal, for instance, is not
THE PRINCIPLES AND PRACTICE OF

a luminous body, for it would be dark if it did not receive light from a luminous body: it belongs therefore to the class of opaque or dark bodies, which comprehend all such as are neither luminous nor will admit the light to pass through them. And transparent bodies are those which admit the light to pass through them; such as glass and water.

No material bodies appear to be perfectly opaque or transparent. Leaf gold sensibly transmits a greenish light, and on the other hand, a depth of seven feet of water intercepts one-half of the light which passes through it.

Light moves in right lines; but its path is liable to be altered in two different ways, depending on the class of bodies it has to encounter in its progress.

If the rays of light, in their progress, encounter opaque bodies, they are reflected. The study of this branch of optical science is called Catoptrics. If, on the contrary, the rays of light impinge on transparent bodies, they are allowed to pass through them, not, however, in a right line, but at an angle which varies with the density of the body: in this case the rays of light are said to be refracted; and the study of this branch of the subject is called Dioptrics.

All visible bodies that are not luminous, are seen by means of rays thrown back or reflected from their surface. Light in its reflection is governed by the same laws as solid, perfectly elastic bodies. If a ray of light fall upon an opaque body perpendicularly, it is reflected perpendicularly. If a ray of light fall upon a surface obliquely, it is reflected obliquely, but in the opposite direction, the angle of incidence being equal to the angle of reflection. The term reflection is usually confined to those cases in which the rays are thrown back in a definite order, either in lines parallel to each other, or uniformly convergent or divergent. To produce this species of reflection, a surface must be highly polished, in order that there may be uniformity in the angles at which the greater part of the rays are returned.
Refraction is the effect which transparent media produce on light in its passage through them. If a ray of light, in passing from one medium to another of different density, falls vertically on its surface, no refraction takes place, and it continues its course through the medium in its original direction. If the ray enter the new medium obliquely, it deviates from its course, and appears broken at the point of immersion, or that point of the surface at which the ray enters. If the ray of light passes from a rarer to a denser medium, it approaches the perpendicular at the point of contact; it separates from it, on the contrary, when it passes from a denser to a rarer medium. The same phenomenon occurs, but in an opposite manner, when the ray again enters the first medium; so that if the two surfaces of the medium which the ray traverses are parallel, the ray, on returning into the surrounding medium, will take a direction parallel to the incident ray.

The angle of incidence is that which is made by the incident ray with a perpendicular line drawn through the point of immersion on the surface of the medium, and the angle of refraction is that which is made by the broken ray with the same perpendicular.

The extent of refraction produced by the same medium depends upon the angle at which the rays of light enter. Bodies refract light in proportion to their density and combustibility. Thus, if two bodies are of equal density, but the one is composed of more combustible elements than the other, the refracting power of the first will be greater than that of the second.

All diaphanous bodies, when they refract light, also reflect it. In consequence of this property, those bodies, to a certain extent, fulfil the office of mirrors. If they have little density, as the air, they are not visible unless the mass is considerable.

The form of the refracting body does not influence the refracting power, but modifies the disposition of the refracted rays with respect to each other. In fact, as perpendiculars to the surface of a body approach and recede according to its form, so do the refracted rays approach and recede from each other.

According to the form of the refracting bodies, the rays of light...
have either a tendency to converge to a point or focus, or to diverge, or to proceed onwards in parallel lines. If the two surfaces of a body be parallel, the refracted rays are parallel. If either or both surfaces are convex, the refracted rays will converge to a central point. On the contrary, if the surfaces be concave, the refracted ray will, to an equal extent, diverge from the central point.

The substance which is most commonly employed for refracting the rays of light, both in optical experiments, and in optical instruments, is glass: which, for these purposes is shaped into a variety of forms. 1st. A plane glass, in which the two surfaces are parallel. 2d. A spherical lens, which has every point of its surface equally distant from a common centre. 3d. A double convex lens, which is bounded by two convex spherical surfaces, whose centres are on opposite sides of the lens: it is either equally convex, when the radii of both surfaces are equal; or unequally convex when the radii are unequal. 4th. A plano-convex lens, which is bounded by a plane surface on one side, and a convex on the other. 5th. A double concave lens, which is bounded by two concave spherical surfaces, whose centres are on opposite sides of the lens. 6th. A plano-concave lens, which is bounded by a plane surface on one side, and a concave one on the other. 7th. A meniscus, which is bounded on one side by a concave surface, and on the other by a convex one; and these two surfaces meet at the circumference if continued. 8th. A concavo-convex lens, bounded by a concave and convex surface; but these two do not meet at the circumference, though continued. 9th. A prism, having two plane surfaces inclined to one another. The first of these transmit the rays in a parallel direction. The 2d, 3d, 4th, 7th and 8th, all cause the rays of light to converge towards a central point or focus. The 5th, 6th, and 9th, produce a divergence of the rays of light.

The rays of light, when transmitted through a medium having both surfaces parallel, undergo two refractions, one at the point of immersion, and the other at the point of emergence, and these being equal and in opposite directions, no sensible effect is produced, and the rays continue onward in parallel lines: if, however, the two
surfaces of the refracting medium be not parallel, then the rays of light, in passing through it, will in like manner undergo two refractions, but these will take place in the same direction, and therefore the rays of light, after being refracted, will not be parallel; if the surfaces be convex, those rays which fall obliquely upon it will be refracted towards the axis, and will meet at a point beyond the lens called its focus, a point which depends both upon the form of the lens, and the refractive power of the substance of which it is made; if, however, the surfaces be concave, or oblique as in the prism, then those rays which fall obliquely upon it will be refracted from the axis, and consequently will be dispersed.

If we examine the rays of light, after they have undergone refraction by means of a prism, we become aware of the curious and important fact that ordinary white light is itself composed of a multitude of rays of different colours and different degrees of refrangibility. If a bundle of rays is made to pass through a glass prism, or any other refracting body, whose surfaces are not parallel, the bundle enlarges, and if, after its departure from the body, it is received upon a plane, as a sheet of paper, it is found to occupy a large extent, and instead of producing a white image, it produces an oblong one of many colours, succeeding each other by insensible degrees, and among which the seven following are distinguishable; red, orange, yellow, green, blue, indigo, and violet. Each of these colours is indecomposable; their assemblage forms the solar spectrum. The primitive colours are stated by some to be only three, red, yellow, and blue; and that the intermediate tints of orange, green, indigo, and violet, are only combinations of the other three; this, however, is matter for dispute. Light, therefore, is not simple and homogeneous, but it is made up of innumerable coloured rays, which by their union constitute white light. The compound nature of light is proved, as I have already stated, by the action of the prism, by means of which the different coloured rays, of which white light is composed, are separated according to the angles at which they are refracted. The violet rays have the greatest angle of refraction, consequently they deviate
most from their original course, and appear at one extremity of the spectrum. Contiguous to the violet are the indigo, then follow in succession, the blue, green, yellow, orange, and lastly red, which, as they have the smallest angle of refraction, deviate least from their original course, and consequently appear at the other extremity of the spectrum. The compound nature of light may be further proved by the fact, that by the recombination of these coloured rays, white light is again produced. This can be done by letting the coloured rays, which have been separated by a prism, fall upon a lens, which will make them converge to a focus; and, when thus reunited, they will appear white as they did before refraction: or, if a card be painted in compartments with these seven colours, and made to revolve rapidly, the same effect will be produced, white light being the result.

Upon our knowledge of the compound nature of light depends the explanation of the colour of bodies. Colour does not absolutely reside in the body itself, but is dependent on the power which material bodies possess, of absorbing some rays, and reflecting others. A body, which, when viewed by white light appears red, will, when viewed by any of the prismatic colours, appear of that colour, whichever it may be. The reason is plain; in the first example the white light suffered decomposition, the red rays alone were reflected, all the rest were absorbed; in the second example, the coloured rays admitted of no further decomposition, and consequently were reflected unchanged. A body appears therefore to be of the colour which it reflects; as we see it only by reflected rays, it can only appear of the colour of those rays. Objects in the dark have no colour, or are black, which is the same thing. Light is composed of colours, therefore there can be no colours without light; and though every object is black, or without colour in the dark, it becomes coloured as soon as it becomes visible. Though bodies, from the arrangement of their particles, have a tendency to absorb some rays and reflect others, yet they are not so perfectly uniform in their arrangement as to reflect only pure rays of one colour, and perfectly absorb the
others. A body reflects, in great abundance, the rays which determine its colour, and the others in a greater or less degree, in proportion as they are nearer or farther from its own colour in the order of refrangibility. Bodies which reflect all the rays are white; those which absorb them all are black. Between these extremes, they appear lighter or darker, in proportion to the quantity of rays they reflect or absorb. Pale coloured bodies reflect all the coloured rays to a certain extent, which produces their paleness, approaching to whiteness; but one colour they reflect more than the rest: this predominates over the white, and determines the colour of the body. Since, then, bodies of a pale colour in some degree reflect all the rays of light, in passing through the various colours of the spectrum, they will reflect them all with tolerable brilliancy, but will appear most vivid in the ray of their natural colour. Transparent bodies also appear coloured by the light which they refract, and when seen by refraction, they often appear of a different colour than when seen by reflection.

If it is inquired why such a body reflects a certain colour, while another absorbs it? It may be answered, that this tendency, to absorb or reflect particular rays, is supposed to depend on the arrangement of the minute particles of the body, and that the diversity of arrangement renders some bodies susceptible of reflecting one coloured ray, and absorbing the rest, whilst others have a tendency to reflect all the colours, and others again to absorb them all. How far this may be considered in the light of an explanation, each must determine for himself.

In the preceding sketch, it has been attempted to explain, as clearly as our limits would permit, some of those general laws which regulate the reflection and refraction of light. We are now better qualified to enter into an examination of the physiology of vision, and to examine in what manner the various portions of the apparatus of vision contribute to the performance of perfect vision.

The apparatus of vision is composed of three parts.
The first modifies light.
The second receives its impression.
The third transmits this impression to the brain.
The texture of the apparatus of vision is so extremely delicate, that it is affected by the slightest cause; nature, therefore, has placed before it a series of organs to protect and preserve it in the conditions requisite for the exercise of its functions.

These protecting parts are the eyebrows, eyelids, and secretory and excretory organs of the tears.

Eyebrows.
The *eyebrows* have many uses. The projection which they form protects the eye from external violence; the hairs, from their oblique direction, and the oily matter which covers them, prevent the perspired fluid from running towards the eye and irritating the surface of this organ, and direct it towards the temple and root of the nose. The colour and number of the hairs of the eyebrows influence their use. They usually vary with climate. In the natives of hot climates, they are very thick and black; in those of cold climates, they may be thick, but are very rarely black. The eyebrows protect the eye from the impression of too strong a light, more especially when coming from above: we increase this effect by frowning.

Eyelids.
The *eyelids* cover the eye during sleep, and preserve it from the contact of foreign bodies flying in the atmosphere; guard it from blows by shutting almost instantaneously; by their habitual motions, which occur after nearly equal intervals, they oppose the effects of the prolonged contact of the air: they also moderate the force of too strong a light, for, by approximating, they allow such a quantity of it to pass as is necessary to vision, but incapable of injuring the eye. On the contrary, when the light is weak, we open the eyelids widely, to allow as much as possible to enter the eye.

Eyelashes.
When the eyelids are brought near each other, the *eyelashes* form a sort of grating, which permits a certain quantity only of light to pass at once. When the eyelashes are wet, the little drops on their surface decompose light as the prism does, and the point
from which it emanates appears irradiated. The eyelashes, by separating into bundles the light which penetrates the eye, cause bodies on fire, during the night, to appear surrounded with luminous rays. This effect disappears the moment the lids are opened, or merely another direction given to the eyelashes. We may readily conceive that the eyelashes protect the eye from the particles of dust which fly in the air. Vision is always more or less altered in persons deprived of their eyelashes.

The closed eyelids are penetrated by a full light, so as in ordinary circumstances to occasion waking; and distress to persons whose eyes are inflamed. The superior tarsus, when drawn up, slides under the arch of the orbit, but retains its apposition to the globe, owing to the laxity of its attachment with the integument of the palpebra.

The levator palpebrae being purely a voluntary muscle, the simple suspension of its action effects the closure of the eyelids, as its contraction opens them in the act of waking. Hence, the disposition in the upper eyelid to fall, announces the approach of sleep. In febrile and exhausted states of the system, its impaired energy occasions the drooping expressed by the term "heavy eyed," one of the most characteristic symptoms in the physiognomy of disease. A similar state belongs to some morbid affections of vision, of which I shall have occasion to speak hereafter. A voluntary closure of the eyelids, as when the eye is, from any cause, irritable to light, is performed by the orbicularis palpebrarum, which in some casualties and morbid states, contracts spasmodically, and the relaxation of this muscle assists the opening of the closed eyelids. In going to sleep and awaking from it, the lower lid is therefore passive; in a voluntary shutting and opening of the eye it participates, although inconsiderably, in both actions. Winking is an alternation of the actions of the levator and orbicularis, and therefore a seasonable relief to the former, and a means of preserving the moist and clear condition of the cornea. It is performed by a very slight contraction of the palpebral portion of the orbicularis. The combination of the action of the corrugator and
orbicularis is seen in the strained closure of the lids to resist their separation by external force, knitting and depressing the eyebrows, and throwing the nose and forehead into folds; and the equipoise of the actions of the orbicularis and levator is evinced in the approximation or screwing of the eyelids, and peering, as is customary in short-sighted persons. When they are both in full action, the corrugator acts as a moderator to the levator; the orbicularis is the antagonist of the latter.

The conjunctiva protects the anterior surface of the eye, secretes a fluid which mixes with the tears, and appears to have the same office; possesses the power of absorption, supports the friction which occurs when the eye moves, and, being very highly polished and constantly moist, render these motions very easy. Lastly, it receives the contact of the air when not covered by tears. According to Mr. Travers, the idea that the conjunctiva is a secreting membrane, "rests solely on the supposed relation of the conjunctiva to the class of mucous membranes." But this need be no fetter upon our conception of the matter; for not only do we see from the varieties of its surface, that its economy is not throughout the same, but anatomists describes its continuity with the cutis as much as with the membrana narium. Again, the capillaries of mucous membranes carry red blood, which is not the case in the conjunctiva of the globe in health. But there is no evidence of such a secretion; upon the cornea it is not assumed to exist, yet the difference between the corneal and sclerotic portions is only in the strictness of its adhesion. The follicles and caruncula are specifically provided for preventing the effects of friction, and the incessant, although insensible escape of the tears from the lachrymal ducts, unavoidable under the act of winking, in which the upper lid sweeps over and preserves the polish of the cornea, renders such a provision superfluous, and therefore improbable. In disease the sclerotic conjunctiva secretes a mucus which is immediately obvious, (the corneal surface excepted,) because its vessels do not admit red blood, and this is in conformity with what we see of the mucous membrane properly so called, as of the urethra and
intestinal canal, which continually shew that the secretion can be set up by disease upon a whole surface, while in the healthy state this function is confined to its follicles and lacunæ.

A young woman who had never shed tears, and was incapable of doing so, had a shrivelled, opaque, and cuticular conjunctiva.

The lachrymal gland secretes the tears, and by means of several small ducts, pours them upon the conjunctiva at the upper and back part of the eye. But what becomes of them when they arrive at this part? This we shall now explain. We observe, in the first place, that they must flow in a different manner when we are asleep to that when we are awake. When we are awake, the eyelids are alternately approaching and separating from each other; the conjunctiva is exposed to the contact of the air; the eye is in continual motion; nothing of this kind occurs during sleep.

Physiologists suppose that the tears flow in a triangular canal, destined to conduct them towards the great angle of the eye, where they are absorbed by the puncta lachrymalia. This canal, they say, is formed, 1st, by the edges of the eyelids, whose surfaces, rounded and convex, touch only at one point; 2dly, by the anterior surface of the eye, which completes it behind. The external extremity of this canal is more elevated than the internal. This disposition, joined with the contraction of the orbicularis muscle, whose point is fixed to the nasal process of the superior maxillary bone, directs the tears towards the puncta lachrymalia.

This explanation, according to M. Magendie, is defective: the eyelids are in contact, not by a rounded edge but by their margins, which are flat; the canal, therefore, of which they talk does not exist. In fact, if we examine the posterior surface of the eyelids when in contact, we can scarcely detect the line which indicates the point at which they touch. Besides, if we admit the existence of this canal, it can only serve for the passage of the tears during sleep; we should still have to enquire into their course during the waking state.

During sleep, and whenever the eyelids meet, the tears gradually diffuse themselves over all the ocular and palpebral surface of the
conunctiva, and must stream in the largest quantity where they find the least resistance. The course which presents the fewest obstacles, is along the part where the conjunctiva passes from the eye to the lids; along this they easily arrive at the puncta lacrymalia. The tears thus diffused upon the conjunctiva must mix with the fluids secreted by this membrane, and experience the absorption, which it carries on.

When we are awake, things go on differently. The portion of the conjunctiva in contact with the air, allows the tears which are upon it to evaporate, and would become dry if the tears were not renewed by the motion of winking, of which I conceive this to be the chief purpose. The tears thus lying on the part of the conjunctiva exposed to the air, form an uniform layer upon it, which gives to the eye its polish and brilliancy; the increased or diminished thickness of this layer greatly influences the expression of the eyes; in empassioned looks, for instance, it is obviously thicker.

In the ordinary condition of the lacrymal secretion, the tears are not in the least disposed to overflow the lower eyelid. I know not upon what can be founded the use commonly ascribed to the fluid of Meibomius, of opposing this overflow, somewhat as a layer of oil upon the edge of a watery vessel opposes a watery fluid which rises above it. This effect of the Meibomian secretion I doubt, because it is soluble in the tears. The tears which do not evaporate, or are not absorbed by the conjunctiva, are absorbed by the lacrymal ducts, and carried to the inferior meatus of the nostrils by the nasal canal.

The origin of some fibres of the orbicularis from the ligamentous expansion which supports and protects the lacrymal sac, gives it a power of compressing the sac in its contraction, and thus assists in the excretion of tears. This is in part proved by the epiphora which accompanies a fixed state of the lower palpebra from injuries, and the paralysis of the orbicularis, which states also prevent the due opposition of the puncta. Hence, too, people wink often and forcibly whose eyes are disposed to water, and after shedding tears.
The puncta lachrymalia absorb the tears, not by any capillary attraction, but by a vital action as absorbent mouths. They are often spasmodically contracted, and afford a resistance to the introduction of Anel's probe, but yield to the point of a pin, so as afterwards readily to admit a probe of much larger dimensions. When over dilated, they lose for a time their absorbing power, and the epiphora is increased. When they are morbidly patulous and atonic, as sometimes happens in age, the epiphora is permanent; and their function is frequently arrested by inflammation of the sac, for we often find the epiphora altogether independent of obstruction. The direction of the superior duct varies a little in relation to the sac, according to the degree of elevation of the upper lid. By drawing the lid upwards and towards the nose, it is brought nearly into a line with the axis of the sac. The area of the sac and nasal portion of the duct, exceeding that of their orifices, facilitates the passage of the tears; the slight elevations of the lining membrane, and the narrowness and obliquity of the nasal opening, probably retard the excretion, which would be inconvenient if constantly taking place.

The actions of the recti singly, are to direct the eye to four equidistant points of a circle, and, in concert, to turn the eye towards all the intermediate points: they also exert a constant effort to retract the eye, against which the elasticity of the optic nerve, and of the adipose tissue in the orbit, would make a very inadequate resistance.

The action of the oblique muscles is involved in some obscurity: there can indeed be no doubt respecting their principal use; by drawing the eye forwards they prevent that constant retraction which would otherwise be produced by the recti. But individually they are calculated to give, each its specific direction to the eye: the obliquus superior points the optic axis downwards and inwards; the obliquus inferior, on the other hand, directs the eye upwards and outwards. The combined actions of the whole preserve the relative position of the eye to the object, independent equally of the motions of the object and the head. The motions of the eyes
are in perfect accordance, and the will cannot place them in opposition.

What renders this question still more intricate is, that three nerves are employed to supply the six muscles that have been described. The fourth nerve supplies the obliquus superior, the sixth supplies the rectus externus, and the third supplies the remaining muscles.

It is remarkable again, that of the six muscles of the eyeball, three turn the optic axis directly or obliquely outwards, (provided the obliquus superior is a rotator outwards, as many suppose,) and that each of these three muscles is supplied by a different nerve; two, indeed, have an entire nerve exclusively distributed to each of them.

The intricacy of the muscular motions of the eye admits, however, of a conjectural explanation. We may remark, that their distribution is not such as to allow of our opposing the recti to the obliqui: in following this indication we are stopped by the fact, that the third nerve supplies half or greater part of each class. But from the close anatomical relation between the origins of the third nerve and of the fourth, we may conclude their function to be not materially different; whereas the sixth nerve, rising from a remote point, seems distinguished from both the others.

It appears to be a principle universally observed in the construction of the nervous system, that nerves of motion rise near the origin of those sentient nerves, through which the actions they control are habitually guided or called into play.

This principle is remarkably shown in all the spinal nerves, and in the distribution of the fifth and seventh cerebral nerves; and the origin of the third and fourth nerves is perhaps sufficiently near that of the optic nerve to bring them both under the same law. Now, when we investigate the origin of the sixth nerve, we find it passing to the back part of the medulla oblongata, so as to rise near the fifth and seventh; in other words, it rises near those nerves which comprehend within their functions, the sensibility of the surface of the eye, an influence over the secretion of the lachrymal
OPHTHALMIC SURGERY.

... gland, and the sense of hearing. Again, when we examine the distribution of the sixth nerve we find it forming the sole supply of a muscle which has a remarkable consent with the three offices alluded to. The rectus externus or abducens oculi, which it supplies, directs the axis of the eye outwards. And we may remark, 1st, that when the optic axis is directed outwards, the surface of the eye is carried towards the orifices of the ducts of the lachrymal gland; 2dly, that the reversion of the eye for vision is commonly suggested by impressions upon the organ of hearing; and, 3dly, as an instance of the consent between the common feeling of the eye and the action of the abductor, that, when an animal is destroyed by pithing, if while imperfect life yet remains in the head, the eyelids be rendered incapable of closing by the division of the portio dura, and the surface of the eye be then touched, the motion of the eye to avoid the offending substance is in a direction outwards.

When the eyelids are kept shut, the eyes are often in motion. "Inter somnum quietum atque placidum, (observes Soemmering in his Icones Oculi Humani,) bulbus oculi, ut in ipsis somnolentis videre licet, paulo plus sursum trahitur." In some instances this elevation of the axis of the eye during sleep is very considerable, in others it is very slight.

Squinting consists in a want of consent between the muscles of the two eyes, through which defect the optic axes are habitually directed towards different points. The inclination of one eye inwards may be so great as to exclude it from the vision of objects towards which the other is turned, or may be so slight as to allow of the distorted eye taking in part of the same field of vision with its fellow. In either case, it appears that those who squint habitually neglect the impressions upon the distorted eye, and see with but one eye.

The cause of squinting is obscure: for though it frequently happens that the eye, which squints, has an imperfect vision, so as to favour the supposition that it is instinctively averted in order to prevent the perception of objects becoming confused; yet, in other cases, vision with either eye is equally good, and the patient can at...
will employ either singly, but cannot prevent the other from turning away from the object of vision.

Perhaps, in cases of the latter description, the original adjustment of the two eyes is not true; so that if both were directed towards the same object, it might necessarily appear double.

The eye consists of various parts, some of which refract the rays of light in their course, whilst others receive and transmit the impression produced by them. The refracting parts are,—

A. The *transparent cornea* a refracting body, convex and concave, resembling very much in its figure, transparency, and mode of insertion, the glass placed before the face of a watch.

B. The *aqueous humour*, filling the chambers of the eye; it is not purely aqueous, as its name implies, but is composed of water and a little albumen.

C. The *crystalline humour*, improperly compared to a lens. The comparison is exact as far as regards form; but with respect to its structure is completely defective; for the crystalline humour consists of concentric layers, gradually increasing in hardness from the surface to the centre, and probably of different refractive powers. The crystalline is besides enveloped in a membrane, which experience proves to be of great importance in vision. A *lens*, on the contrary, is homogeneous throughout, at its surface, and every point of its substance, and has also throughout the same power of refraction.

D. Behind the crystalline is the *vitreous humour*, so called from its resemblance to melted glass.

The humours of the eye, according to Berzelius, consist of,—

<table>
<thead>
<tr>
<th></th>
<th>Aqueous humour</th>
<th>Vitreous humour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>98.10</td>
<td>98.40</td>
</tr>
<tr>
<td>Albumen</td>
<td>a trace</td>
<td>0.16</td>
</tr>
<tr>
<td>Muriates and lactates</td>
<td>1.15</td>
<td>1.42</td>
</tr>
<tr>
<td>Soda, with animal matter soluble in water</td>
<td>0.75</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>
Crystalline Lens.

Water .................................................. 58.
Peculiar matter, analogous to the colouring matter of the blood ............... 35.9
Muriates, lactates, and animal matter soluble in alcohol .................. 2.4
Animal matter soluble only in water ........................................ 1.3
Insoluble membrane ........................................................................ 2.4

110.0

The refracting powers of the humours of the eye are, according to different observers, as follows:—

<table>
<thead>
<tr>
<th></th>
<th>Aqueous humour</th>
<th>Vitreous humour</th>
<th>Crystalline Lens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hawksbee</td>
<td>1.335</td>
<td>1.335</td>
<td>1.046</td>
</tr>
<tr>
<td>Jurin</td>
<td>1.333</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rochon</td>
<td>1.329</td>
<td>1.332</td>
<td>1.035</td>
</tr>
<tr>
<td>Young</td>
<td>1.333</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brewster</td>
<td>1.336</td>
<td>1.339</td>
<td>1.376 1.399 1.383</td>
</tr>
</tbody>
</table>

From the last of these measures we may deduce the following indices of refraction:—

For rays passing from the aqueous humour into the outer coat of the crystalline humour .................................................. 1.046
For rays passing from the aqueous humour into the crystalline, taking its mean index of refraction .......................... 1.035
For rays passing from the outer coat of the crystalline into the vitreous humour .................................................... 0.93

Besides these refracting media, there are various other parts, each of which has some particular use in vision.

A. The sclerotic membrane, the external coat of the eye, fibrous, thick and resisting, and evidently intended to protect the interior of the eye: it serves also for the insertion of the muscles which move the eye.

B. The choroid membrane, a vascular and nervous membrane
covered with a black matter, which is of much importance in vision, by absorbing the superfluous light.

C. The *iris*, found behind the transparent cornea, of different colours in different persons, and pierced in the centre by an opening called *pupil*, which increases and diminishes according to the intensity of the light.

D. The *retina*, or membranous expansion of the optic nerve, which is specially destined for the reception of impressions made by the rays of light.

E. The *optic nerve*, through the medium of which we become conscious of impressions made upon the retina.

The rays of light in passing through the various humours of the eye undergo a series of refractions, by which they are collected into focal points upon the retina, so as to form a complete picture of the external scene.

From what has been already said, it will be perceived that each pencil will consist of a double cone of rays, the axes of which are right lines, their bases meeting in the crystalline, and their apices being situated in the object and the retina respectively. The rays from the top of the object are deflected to the bottom of the eye, and those from the side of the object to the right of the observer, are deflected to the left side of the eye, and vice versâ: hence the inversion of the picture upon the retina. The following simple experiment, demonstrating this fact, is well known. A portion of the coats being removed from the back of the eye, and their place supplied by a piece of oiled or tracing paper, the flame of a candle placed before the cornea is exhibited of diminished size, and inverted. We infer, that this image excites the perception of the object, because distinct vision is enjoyed only in such conformations and conditions of the eye, as to allow its being accurately formed and impressed.

If we look in a concave mirror, objects appear inverted. The image formed upon the retina is in this case erect, and we see the object in the same relative position to the image as all other objects. Of this fact any one may convince himself, by preparing an
eye, as before mentioned, and placing beside and a little behind the flame of the candle a spoon, the hollow of which reflects it inverted, when he will observe on the opposite side of the oiled paper, the images of the real and the reflected object, the first inverted, the second erect.

It has been generally supposed that we actually see objects inverted, and that this error of the sight is corrected by experience. Some, on the contrary, have supposed that the mind acquires the perception of objects, not from the picture upon the retina, but from the object itself, by retracing the direction of the pencils to their points of radiation. Others assert, that a decussation of the fibres of the optic nerve corrects the erroneous impression before it is presented to the sensorium.

The celebrated explanation of Berkeley, in so far as it admits of an abridged exposition, is as follows. Visible and tangible ideas occupy distinct provinces, and have originally no affinity to each other. It is only by experience that they become connected. The impressions on the organ of sight suggests by association the ideas of objects acquired by the sense of touch, just in the same way as the word used to denote an object immediately suggests the idea of that object, to a person who is familiar with the language. The image on the retina is merely the instrument, not the object of vision. Its position has originally no influence on the ideas we form of the situation of external objects; and the supposed difficulty in the case of the inverted images arises from confounding ideas derived from the sense of touch with those derived from the sense of sight.

The association of ideas derived as they are from the external senses, operates imperceptibly to an extent that we have no means of ascertaining, because the original and absolute negation of each sense in succession, so that each should be in turn insulated, is an impossible condition, notwithstanding the seemingly possible independence, in a state of society at least, of the animal and vital functions. Touch, in the extended sense of physical feeling, is the basis of all; sight, hearing, smell, and taste, like the sense of
touch itself in its strict and limited import, are but modifications of it. That either or all of these, therefore, should be wanting, is not incompatible with their constitution; but the sense of contact is so essentially and individually incorporate with the organic nervous system, that its negation would be paramount to acephalous monstrosity. Hence its influence as a substitute and corrector in relation to the rest, when wanting can never be fully appreciated, because it cannot, like them, be subjected to analytical test. But from what we see of the effects of privation of one or more of the external senses, and of their reciprocity in general towards each other in cases of malformation and disease, is it not in the highest degree probable, that their natural intercourse and cooperation are essential to the development of each respectively? To illustrate this position. If it be possible to suppose a case in which the eye was the only external organ of sense, would the unfortunate possessor have any distinct idea of visible objects; or, mutatis mutandis, the ear of sounds? Certainly not. Dumbness is in most cases only a consequence of the absence of hearing; the organs of speech are perfect: so the loss of visual perception (not of light more than of unharmonized articulation) would result in the case supposed, from the absence of the associated sensations and ideas thence derived.

After all that has been said about the inversion of the image, and the perplexity which theorists have involved it in, by attempting to explain it; it will be found, if we admit the law of visual direction, to be not only easy of explanation, but to be, in fact, the only means by which correct vision could have been obtained. It has been stated to be the particular endowment of the retina, that when adequate impressions are made upon it, sensations of colour are produced. A very trifling addition to this statement contains the enunciation of a principle, upon which almost all the phenomena of vision depend, and to which the entire construction of the eye has reference. When an impression is made upon the retina sufficient to produce sensations of colour, the colour appears projected in a line vertical to the point of the retina which has been excited.
Thus, if pressure be made with the finger upon the outside of the eyeball, a circular spectrum is seen in the direction of the nose; if the pressure be made at the upper part of the eyeball, the spectrum appears towards the cheek; if below, towards the eyebrow. The spectrum is always opposite to the point compressed, or is projected in a line vertical to the point of the retina which is excited to sensation. It appears that, by this endowment of the retina, the direction is rigorously determined, in which we can see by each point of its surface. The upper part, when excited, sees downwards, the lower part upwards, the inner outwards, the outer inwards. Through this law of visual direction, the inverted image on the retina is seen in the opposite or correct position.

Now the retina is to be used in giving us notions of the visual directions of objects, which are to correspond exactly with the notions that we derive from the sense of touch. Accordingly, we find placed before the retina a series of media, the effect of which is to produce true vision by means of the law of visual direction above mentioned: these are the refracting media, which have been already mentioned.

In speaking of the refraction of rays at the surfaces of spheres and lenses, we have supposed that all the rays meet exactly in the focus. This, however, is not strictly the case; for if rays, falling on the surface of a sphere at a particular point, are collected to a focal point beyond this lens, other rays falling on the surface of the lens nearer to the axis, will have their focus at a point farther from the sphere than the former. This is easily proved by actually projecting the refracted rays, and if it is done for those rays farthest from the axis, and for those nearest to the axis, the difference between the foci of these rays is called the spherical aberration, or the aberration or straying of the rays from the focus, caused by the spherical figure of the lens. This aberration arises from the curvature of the lens being equally spherical, for if the surface of the lens was more convex towards the axis, the focal distance of rays falling on that part would be diminished, and consequently would be less.
Hence, in order to refract rays at different distances from the axis to the same point, the surfaces of the lens must have different degrees of curvature at different distances from the axis. The lens with least spherical aberration is a double convex one, whose radii are as one to six; the side whose radius is one being turned towards parallel rays. The aberration then is \( \frac{7}{100} \) of its thickness. As it is desirable to reduce this aberration in all optical experiments, but more especially in vision, to the lowest possible degree, various contrivances have been adopted to accomplish this end. In optical instruments this is effected by the combination of lenses of various forms, by which means their aberration is neutralized. In the eye this is compensated by a variety of means, which we shall now take notice of.

The necessary effect of the spherical figure of the cornea is to occasion an unequal refraction of the rays which permeate it, and hence to create a degree of aberration which would confuse vision. This is corrected in two ways: first, by the mobility of the iris, which, adapting the size of the pupil to the circumstances of the case, excludes, more or less, those rays which would produce aberration; and secondly, by the gradually increasing density of the lens from the circumference to the centre, and its consequently refracting with less power the rays which arrive at it with a considerable obliquity.

It has been stated that the iris serves to arrest those rays which are denied admission through the pupil: they would be unequally refracted by those points of the lens through which, if uninterrupted, they must pass, or would fall so obliquely on the cornea, as to be subjected to too great a refraction. This is its passive function; but by its power of dilatation and contraction, in obedience to the stimulus of light upon the retina, it determines the quantity necessary for the purposes of distinct vision. In regulating the quantity of light, the iris materially assists in accommodating the eye to different distances; in viewing a distant object the pupil dilates, and in viewing a near one it contracts. It is true that viewing the sun occasions a contraction of the pupil,
and the stedfast vision of a near object in deficient light, its dilatation. These are confirmations of the statement that its motions are in obedience to the impression of light upon the retina, because the direct emanation of light from its source in the one case, and the insufficient light in the other, render these objects analogous in this respect to the nearest and the remotest visible objects. But under ordinary circumstances, the illumination of objects being conformable to the distance, the pupil, in viewing a distant object, is dilated so as to admit as many rays of the enfeebled light as are necessary to the distinct perception of the object; and on the other hand contracts, to exclude the superfluous rays, which, coming from a near object, would otherwise create confusion. Let a person survey the sun whilst the pupil is fully dilated by belladonna, or under the same circumstances, the flame of a candle brought near to the eye, and in either case he will find his vision confused to dimness. But the fullest dilatation of the pupil will not injure the clearness of his vision of any other remote object; though the vision of all near objects will be in a degree confused, and the confusion be increased in proportion to the degree of their illumination. Where the iris is from any cause motionless, the power of adapting the eye to distances is lost. I conclude, therefore, that the adaptation of the eye to light cooperates with its adaptation to distance.

Notwithstanding the absence of satisfactory anatomical proof, I cannot but regard the motions of the iris as muscular motions, and the pupillary portion an orbicular sphincter, such as environ the several outlets or apertures of the body. To this structure I attribute its uniformity under varying magnitudes; its incapacity of contraction, when having a fixed point, as happens in some malformations; when confined by adhesion at any point of the circle to the capsule of the lens, or when its texture has been the subject of adhesive inflammation; its recovery of a prolapse through a section of the cornea, and resuming its circular figure when over-stretched, as in extraction, by a gentle friction of the eyelid—the extreme velocity of its contraction, and the compara-
tive slowness of its relaxation—its ordinary preservation of a mean or middle state, between the spasmodic contraction induced by acute inflammation, and the dilatation we must, from ascertained phenomena, presume to be induced by absolute darkness long continued. Its inferior power of contraction in children, and the increase of its power by exercise, as in artisans incessantly employed upon minute objects, in which it is apt to acquire a rigidity which scarcely admits of dilatation.—Its obedience, in all respects, to the laws which regulate the muscular system.—Its contractility in proportion to the strength and perfection of the nerve of sense with which it is associated.—Its incapacity of perfect contraction when tremulous, and its spastic contraction, even to the resistance of the influence of belladonna, in tetanus.—Its relaxation when the sphincters are relaxed, as in syncope, asphyxia, apoplexy, or compression of the brain, and after the use of alcohol in excess.—Its complete dilatation when under the influence of the sedative poisons, as opium, hyoscyamus, belladonna, &c., to which its proper nerves are in a peculiar manner irritable.

The ciliary portion of the iris I regard as an elastic structure. It is by virtue of its elasticity, that the extraordinary dilatation of the pupil, such as we see under the use of belladonna, is produced. Here, as in other parts, elasticity is opposed to muscular motion; hence, when the latter is paralysed, or from any cause diminished, the former strikingly predominates; when the nervous supply is intercepted, the pupil gapes widely, the action of elasticity being independent of the sensorium.

All animals which have a moveable iris have the pupil circular, oblong, or elliptical, forms favourable to the arrangement of marginal fibres. In fish, the iris is evidently a prolongation of the choroid without interruption of continuity; it is therefore motionless. Mr. Travers concentrated the rays of the sun in the focus of a pocket lens, and threw them upon the pupil of a perch, at the moment of drawing it from the water; it underwent no change. In other animals it contracted to a line, vertical (cat), or horizontal (adder, toad), according to the figure of the pupil;
or to a small pin's head aperture, where it was of a circular form, as in the common snake.

"If we look through the vitreous humour, exposed for a small space on its posterior surface, we observe the plicæ advancing upon its anterior surface beyond the margin of the lens, like a circular fan or screen; if the lens is pressed evenly backwards, the plicæ separate and extend the sacculated circle of Petit, to which their edges are affixed. On remission of the pressure, the lens springs forward and the leaves of the fan are closed. The circumferential compression of the globe increases the closeness of their application. In the dead body, only the most coarse and remote analogies can be obtained to the functions of the living. But I cannot believe so obvious, and yet so exquisite, a contrivance for changing the site and figure of the apparatus, as this view affords, can be without necessity or occasion. Looking, then, at the posterior origin of the processes from the choroid, and their attachment externally to the ciliary ring; their insertion into the vitreous capsule to the edge of the fossula, their encroachment upon the anterior segment of the crystalline, and their termination by distinct prolongations in the substance of the iris at its great circumference; assuming the choroid and annulus as fixed points, and the iris and processes as the moveable parts of the apparatus, it follows that the plicæ will be unbraced and partially open, in the state of mean dilatation of the pupil belonging to passive or atonic vision, and in the state of extreme dilatation of the pupil, accompanied with blindness to near objects, totally relaxed and floating.

"On the contrary, by the steadily contracted state of the pupil suited to the nearest extremity of the focal range, they will be closed and braced together: and, bearing upon the circumference of the crystalline at every point, will necessarily elongate the axis of the lens. These being the extreme states, so in proportion the intermediate degrees of adaptation will be accounted for. Hence the actions of the pupil, however excited, will extend their influence to the lens, and by this catenation of motions, the general
conformity of adjustment to light and adaptation to distance, are to be explained. And this forms no objection to the hypothesis, because it is only in the voluntary and steadily preserved contractions of the pupil, that the latter object is or can be required; for blindness would as surely ensue from gazing on the sun, as death from suspending the actions of the respiratory muscles, were it in our power to do either; and therefore the involuntary has the ascendancy over the voluntary action in both these cases, as it has in all cases of mixed muscles."

Radiated fibres are described by Haller and Zinn, as raised on the posterior surface of the iris, and advancing even to the margin of the pupil. They are distinct from those seen on its anterior surface, and regarded as continuations of the ciliary processes. In man no such fibres are distinguishable by the naked eye; but if the observation, however obtained, be correct, it affords a strong presumption in favour of the power of the iris to change the figure of the lens by the instrumentality of the plicae. The capsule, it is true, is fixed by the processes, but this opposes no obstacle to the change proposed; for the membrane of Petit, to which alone the processes are affixed, is relaxed when they are closed, and extended when they are separated, and thus permits the capsule to yield only in the degree required for the change of the lens; or, in other words, preserves its exact adaptation to the face of the lens, in its opposite and varying states. This I take to be the use of the membranous circle of Petit, that it gives the processes the complete command of the continuous capsule.

Some cases of dilated pupil are accompanied by a bulging of the lens. This is not the effect, but the cause, of dilatation, for it never follows the application of belladonna, provided the capsule be entire; but if from any cause the lens be protruded so as to bear down the natural resistance of the processes, the pupil becomes dilated by its pressure.

It is believed by many, that the motions of the iris in animals are single, and obedient solely to the stimulus, and that they
have no control over the pupil by volition; a property which pertains exclusively to the adjusting power, and which is exerted independently of the variation of light. It is probable that they possess it so far only as it results from the adaptation to light. Notwithstanding, upon watching the eye of a cat, or of a hawk, the contraction of the pupil often appears to be voluntary. When the eye of the animal is bent upon an object that excites its attention, yet which does not shift its position, the pupil may be seen to enlarge and contract alternately. The animal is probably employed in examining the object under different lights, by intentionally admitting more or fewer rays through the pupil.

The iris is a mixed muscle; its motions are regulated in part by the stimulus of light upon the retina, and in part by an effort of the will.

That the motions of the iris which take place upon the sudden changes of light are involuntary, there can be no doubt, for they are observed even in sleep, when the will cannot be exerted, and in the earliest infancy. There is another proof that these motions are involuntary, viz., that they occur in some forms of perfect amaurosis. The pupil has been observed to act briskly, where the person has been totally devoid of the perception of light from bright sunshine, or the flame of a candle held before his eye.

The sympathy of the iris with the retina must be ascribable to a communication between the retina and the ciliary nerves which supply the iris. The small lenticular ganglion, from which these are derived, lies upon the optic nerve, and is probably the medium of communication.

On the other hand, every one may satisfy himself of a power which the will is capable of exercising over the iris, in alternately viewing near and distant objects; the state of relaxation or moderately dilated pupil being suited to the remote, and its tonic or relatively contracted state to the near object. It is seldom that this change is sufficient to be obvious to a bystander where the light remains unchanged, because the faculty is seldom exercised in these circumstances; and still more rare for the state of ac-
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accommodation to be preserved in defiance of the changes of light, because it is an unnatural effort. I have several times observed, in persons whose eyes were steadily fixed upon an object at some yards' distance, that the approach of a candle towards the eye did not stimulate the pupil to contraction, until it was so placed as that its image should fall upon the most sensible part of the retina, when the pupil instantly contracted. So that the voluntary is in subordination to the involuntary, where they are opposed; that is, when the stimulus of light opposes the adaptation of the eye to distance. But by continued application, the mind is capable of acquiring an extraordinary power over the motions of the iris, as is well known to be the case with other muscles subjected in any degree to volition. Of this, Dr. P. M. Roget presents a remarkable illustration, as shewn by the following description of the power which he possesses of contracting or dilating the iris at pleasure.

"When I have stated that I possessed the power of dilating and contracting the iris at pleasure, the fibres of which are usually considered as no more under the dominion of the will, than the heart or blood-vessels, my assertion has, in general, excited much astonishment. Such, however, is strictly the fact. I can easily satisfy any person who witnesses the movements I can produce in them, that this power is totally independent of the influence of light, since I can effectually exert it, although the position of my eye, with regard to the window or candle, as well as the direction of the optic axis, continues unchanged. However singular this power may appear, it admits, I conceive, of a very natural explanation. The effort, of which I am conscious, when performing the voluntary contraction of the pupil, is the same as that which accompanies the adaptation of the eye to short distances, and is of course productive of an increase of its refractive power. This very same power of moving the iris, in fact, is possessed, in a greater or less degree, by every person who enjoys the faculty of distinct vision at different distances. It is accordingly well known, that if a person, after looking at a distant ob-
ject, transfer his attention to a near object, the pupil always contracts. But this change, it is supposed, can never be effected, unless some real object or image, from which light radiates, be present to direct the sight. I have never, indeed, met with any person besides myself, who, while steadily directing his eye to a distant object, and while no other object intervened, could, by a mere effort of the will exerted on the eye, augment its refractive power so as to adapt it to the vision of near objects. That I have acquired such a power, I can ascribe to no other cause than to my having, from my childhood, been much in the habit of observing optical phenomena, and of practising various experiments relating to vision, a subject which I early took great delight in cultivating.

"It is still more easy for me, while an object is placed near my eye and distinctly seen, immediately to relax the organ so as to fit it for the distinct vision of the most distant objects; and these changes I can effect in succession with considerable rapidity, each change being accompanied with a corresponding enlargement or diminution of the pupil. The increasing the refracting power of the eye, is always the change that constitutes the effort; the state of vision adapted to parallel rays being that of complete relaxation. The effort which attends this voluntary contraction of the pupil, when there is no object before the eye to call for such a change, is followed by a sense of fatigue; and if often repeated, or too long continued, it becomes painful, and continues so for a long time afterwards. The fatigue is felt almost exclusively in the eye to which my attention had been directed during the experiment, although the same change takes place in the refractive power, and I believe to the same extent, in the other eye. It is also remarkable, that when there exists a real object of sight which is looked at, and which requires an equal change in the eye for distinct vision, as in the former case, no sense of fatigue, or hardly any, is experienced.

"I need scarcely add, that while I thus alter the refractive power of my eye from that which adapts it to the distance of the
objects which I look at, these objects appear indistinct, from their images either forming before the rays reach the retina, or tending to form beyond it."

In addition to the nerves derived from the lenticular ganglion, the iris receives two or more branches from the nasal nerve (fifth pair), and its actions may possibly be subjected to the will by virtue of the influence which these nerves convey, for from the same source is derived the nerve which supplies the levator palpebræ, which is purely voluntary.

The limited motion which the pupil has when the retina is for the most part insensible, may be considered as an involuntary or automatic motion, similar to that which in a healthy eye affords protection to the retina; and if, as sometimes happens, the iris contracts in a state of blindness, this likewise must be regarded as its involuntary action, for volition cannot precede sensation. It is probable that those motions of the iris, which are in conformity to the impressions of light upon the retina, are purely involuntary; and that those which are in conformity to the situation of objects, and are therefore directly subservient to vision, are under the influence of the will. Hence the dependence of the adjusting faculty upon the perfection of the retina.

Various conjectures have been entertained respecting the functions of the ganglia; some have supposed that they were intended as bars or stops upon volition, and cited the iris, which they supposed to be purely involuntary, in support of their hypothesis. By others, ganglia have been supposed to be small sensoria, or cerebral receptacles, capable of rendering a supply of nervous energy to their filaments, by which they are in a measure independent of the brain and its appendages. Mr. Travers attributes the voluntary motions of the iris to nerves unconnected with ganglia; the involuntary to those derived from the lenticular ganglion, which he regards as a direct medium of communication between these nerves and the retina.

On account of the obscurity which envelopes the actions of the third, fourth, and sixth nerves of the orbit, I insert the following
extract from Professor Müller's work, as translated by Dr. Baly, in order that the reader may, at all events, be put in possession of all the facts known up to the present time, if it does not remove the obscurity in which the subject is involved.

"We are ignorant as to whether the third, fourth, and sixth nerves have sensitive in addition to their motor power. Desmoulin asserts that, when they are stretched or pinched, no pain is produced; but it is difficult to determine this with regard to such small nerves, and after the violence that is necessarily done to the animal in laying them bare.

"The third nerve supplies the levator palpebræ muscle, the superior, inferior, and internal recti, and the inferior oblique; and from its branch to the latter muscle the ciliary or lenticular ganglion derives its short root, while the long root of this ganglion is supplied by the nasal nerve of the fifth, and contains a filament from the cavernous plexus of the sympathetic.

"The influence of the third nerve and that of the nasal nerve on the iris, deserves special consideration. Desmoulin relates that, according to the experiments of Fowler, Reinhold, and Nysten, the application of galvanism to the third nerve causes a contraction of the iris. The excellent enquiries of Mr. Mayo have shewn that the motions of the iris are regulated by the third nerve, through the medium of the short root of the ciliary ganglion, and that the long root of this ganglion, derived from the nasal branch of the fifth, has no influence over the motions.

"The following are the results of his experiments on thirty living pigeons, in which birds M. Muck has shewn that the ciliary ganglion has two roots, one from the third, the other from the fifth nerve.

"1. When the optic nerves are divided in the cranial cavity of a living pigeon, the pupils become fully dilated, and do not contract on the admission of intense light. (Magendie also observed dilatation of the pupil, and immobility of the iris, as a consequence of division of the optic nerve in dogs and cats; while the pupil
became contracted, and the iris immovable when the same experiment was performed on rabbits and guinea-pigs).

"2. When the third pair of nerves is divided in the cranial cavity of a living pigeon, the same result ensues; in both these cases the surface of the eyeball retains its feeling.

"3. When the fifth nerve has been divided on one side in the cranial cavity of a living pigeon, the iris on that side contracts as usual on the admission of light, but the surface of the eye appears to have lost its feeling (which it derived from twigs of the ophtalmic branch of the fifth).

"4. When the optic nerves are pinched in the cranial cavity of a living pigeon, or immediately after its decapitation, the pupils are contracted for an instant on each injury of the nerves. (A phenomenon observed by Flourens also.)

"5. When the third pair of nerves is irritated in the living or dead bird, a like result ensues.

"6. When the fifth nerve is similarly irritated in the dead bird, no affection of the pupil is observed.

"7. When the optic nerves have been divided within the cranial cavity of a pigeon, immediately after its decapitation, if the portion of the nerves attached to the eyes be pinched, no contraction of the pupil ensues: if the portion adhering to the brain be pinched, a like contraction of the pupil ensues as if the optic nerve had not been divided.

"8. The previous division of the fifth pair of nerves in the preceding experiment produces no difference in the result.

"9. When the third nerves have been divided in the cranial cavity of the living or dead bird, no change in the pupil ensues on irritating the entire or divided optic nerves.

"From these experiments we may with confidence conclude, that the motor power of the ciliary ganglion and nerves is derived from the third nerve, and that the light does not cause the contraction of the pupil by acting directly on the ciliary nerves; but that the irritation of the retina and optic nerve acts immediately
upon the brain, and from the brain is reflected upon the third nerve, and the short motor root of the ciliary ganglion. This might be inferred also from the well known circumstance that, in an eye amaurotic from paralysis of the retina, the direct action of light does not cause contraction of the iris, but that the iris of this same eye still acts when the light is directed upon the other sound eye. Mayo's experiments show, moreover, that the general sensibility of the eye is given to it by the fifth nerve, the ophthalmic branch of which sends filaments to the conjunctiva, while the long root of the ciliary ganglion, from the nasal branch of the fifth, supplies the interior of the eye with sensibility.

"The nutrition of the eye is under the influence of the sympathetic twigs: we have already seen what an influence the sympathetic ganglion has over the nutrition of the eye; and that, after the superior cervical ganglion has been destroyed, inflammation of the eye with effusion ensues. M. Majendie found, that division of the fifth nerve in rabbits, guineas, dogs, and cats, was followed by immobility of the iris, with dilatation of the pupil in dogs and cats, contraction of it in rabbits and guineas. These effects must depend on a reflected action through the medium of the brain. We can now enquire into the mode in which the third nerve influences the motion of the iris, a point respecting which I have made several original observations.

"The third nerve, when excited to action, voluntarily or involuntarily, frequently gives rise to contraction of the iris. Since the third nerve supplies all the recti muscles, with the exception of the rectus externus, we know that when the eye is voluntarily directed outwards, the third nerve is not active, and that it is so when the eye is voluntarily turned inwards. If one eye be closed and the other turned inwards, we may perceive that the pupil becomes contracted, and that it becomes dilated if the eye be directed outwards, the intensity of the light remaining the same. Hence it inevitably follows, that every voluntary motion of the eye, in which the branch of the third nerve to the internal rectus is
engaged, is accompanied by action of the iris; and that, when the sixth nerve is acting, the iris is inactive, the pupil dilated.

"If one eye be turned outwards, the other inwards, no remarkable change in the state of the pupil is observable on account of the opposite conditions of the two eyes. If the axes of the eyes are made to converge in a considerable degree, as in looking at a near object situated at the side, or directly in front, the contraction of the pupil becomes very great; on the contrary, the more parallel the direction of the eyes, and the less the internal recti muscles, which are supplied by the third nerve, are determined to action, the wider does the pupil become.

"Hence we have voluntary power over the motions of the iris; in other words, whenever the third nerve is excited to action by volition, the iris contracts. Now, in looking at near objects, the axes of the eyes are made to converge,—the eyes are turned inwards; and hence, when we direct our eyes to near objects, the pupil becomes much contracted, and dilates when we look at distant objects. The motions of the iris in birds are not really more subject to the will than in man; the pupil becomes very narrow in birds, when we approach them and they become agitated.

"It is not, however, the branch of the third nerve which goes to supply the internal rectus muscle only, that has this sympathetic influence over the iris; other branches, and particularly that which supplies the inferior oblique muscle, have the same power. The inferior oblique muscle rotates the eye so as to carry the pupil upwards and inwards: if this movement be executed voluntarily, the pupil becomes much contracted. The eye takes this position involuntarily when sleep is coming on, in sleep itself, in the state of intoxication, and in hysterical attacks; hence we find the pupil contracted during sleep.

"The contracted pupil of sleep can, however, be made to contract still more by the admission of intense light, according to the observation of Mr. Hawkins. At the moment of waking, the
pupil, after a few irregular contractions, assumes its usual degree of dilatation.

"The facts drawn from comparative anatomy are generally confirmatory of the foregoing physiological results. The ciliary nerves are constantly supplied from the third nerve, and nasal branch of the fifth. The following varieties are met with:—

"1. Branches of the third and nasal nerves unite as roots to form the ciliary ganglion. The ciliary nerves arise in part from the ganglion, and in part from the nasal nerve itself. This is the arrangement of the nerves according to the extended and accurate researches of M. Muck and Tiedemann in the dog, hare, ox, sheep, goat, deer, roe, hog, owl, pigeon, parrot, goose, turkey, and plover (in the turtle also, according to Bojanus).

"2. The ciliary ganglion is connected more immediately with the root derived from the third nerve; the ciliary nerves arising from it, going partly to the eye directly, and partly uniting in a looped manner with ciliary branches of the nasal nerve, some filaments of which are continued separately to the eye. This structure has been found in the cat, falcon, heron, raven, cock, duck, merganser, and tern. I regard this form merely as a variety of the former.

"3. In the rabbit, Muck found no connexion of the third and nasal nerves forming roots of a ganglion; both those nerves gave off ciliary twigs separately. According to Retzius, the ciliary ganglion is here situated nearly within the sheath of the third nerve.

"4. Desmoulins asserts that the nasal nerve gives off no ciliary branches in the rabbit, guinea-pig, and water-rat; all the ciliary nerves, in these animals, being derived from the third: he also states that the ciliary ganglion is absent in them, as in all rodent animals.

"5. No animal with a moveable iris fails to receive ciliary branches from the third nerve, which is always one of their principal sources when the iris is endowed with motion. M. Muck and Tiedemann asserted, it is true, that in the horse the ciliary ganglion is absent, and that the motor oculi nerve gives off no ciliary branches; but Retzius has discovered a very minute
ganglion and its two roots, one derived from the third. Muck is probably in error, likewise, in stating that in the squirrel, also, none of the ciliary nerves are derived from the third nerve.

"6. In fishes, the iris is nearly universally immovable. Muck and Tiedemann found ciliary branches in the salmo hucho, which arose from the third nerve, and from the nasal, and in part anastomosed with each other: in the carp, the ciliary nerves arose from the third pair. From the researches of Professors Schlemm and D'Alton, it appears that fishes do not differ from other animals in respect to the ciliary, which they found to be generally derived from the usual roots.

"7. In mammalia, the sixth nerve gives filaments to the musculus suspensorius, as well as to the external rectus; and in birds, to the muscle of the membrana nictitans.

"8. In cetacea, according to Rapp and Burns, the fifth nerve also gives branches to the muscles of the eye, the special nerves of those muscles being likewise present. Schlemm and D'Alton found the same to be the case in the petromyzon or lamprey.

"9. In the lampreys there are, according to Schlemm, two special nerves for the muscles of the eye; namely, the motor oculi, and trochlearis, which unite in the orbit.

"10. In the myxinoid fishes, the third, fourth, and sixth cerebral nerves are wanting, as well as the muscles of the eye.

"Desmoulins and Majendie state that, when the peduncle of the cerebellum is divided in mammalia, the eye of the corresponding side is directed downwards and forwards, the eye of the opposite side upwards and backwards; section of the pons varolii was attended with the same result."

It has been shown that part of the rays which are dispersed by spherical aberration, are arrested in their progress by the iris: this aberration is still further corrected by the peculiar structure of the lens, the refractive power of which is so adjusted to that of the contiguous aqueous and vitreous humours, as to correct the aberrations which the figure of the cornea would occasion, and to throw the most oblique rays with sufficient accuracy upon the
concave surface of the retina. Not only is the clearness of the image undisturbed by superfluous light, but it is also destitute of colour, the decomposition of light by irregular refraction, being in ordinary vision prevented or corrected by the structure and curvature of the crystalline lens. Light, artificially separated, either by refraction, reflection, or inflection, produces colour; but the light which arrives at the eye in its natural combination of elementary rays, undergoes no such decomposition in its passage through the humours.

According to Dr. Brewster this is not strictly the case, who says that no provision is made in the human eye for the correction of colour, because the deviation of the differently coloured rays is too small to produce indistinctness of vision. If we shut up all the pupil excepting a portion of its edge, or look past the finger held near the eye, till the finger almost hides a narrow line of white light, we shall see a distinct prismatic spectrum of this line containing all the different colours; an effect which could not take place if the eye were achromatic.

For perfect vision with the human eye, it seems requisite that the rays of light should undergo no reflection after reaching the retina. To provide for this object, the delicate membrane called the choroid, which immediately contains the retina, secretes in the human eye a black mucus called the pigmentum nigrum, which has the effect of absorbing the rays of light that have once reached the retina. Those in whom this black pigment is wanting, have a weak sight, and only see distinctly in an obscure light. We may suppose the retina in such cases liable to be dazzled by the reflection of part of the light from the vascular choroid. On the other hand, there are animals which habitually seek their prey in the dark; in these and in several instances where the final cause of the peculiarity of structure is not equally obvious, the back part of the choroid is covered with a membrane termed the tapetum lucidum, which presents a brilliant reflecting surface. The lustre of the eyes of cats in an obscure place results from this cause. It is supposed that the double impression of a low
degree of light upon the retina may be equivalent to the single impingement of brighter light. M. Majendie ingeniously compares with this disposition of parts, a structure observed by himself in the eyes of birds remarkable for their acute vision. In the eagle, the retina lies in numerous folds, so that we may suppose it several times perforated by the rays of light.

The eye of the Albino is remarkable for its want of pigmentum nigrum, in consequence of which the pupil and iris are coloured of different shades of red. In such persons vision is weak in the ordinary light of day, and distinct only in a darkened room, or at twilight. The eyes of Albinoes are likewise observed to be in continual motion, unconsciously oscillating from side to side, even when their sight is most steadily bent upon an object. There can be little doubt that this provision is intended to save the unprotected retina, by preventing a continual impression of undue intensity upon one point. Other people use one part of the retina for perfect vision, and direct it successively towards the different points of an object while examining it; the Albino uses several, continually alternating from one to the other. The motion is unattended with any apparent change of place in the object, (such as that which occurs when the eye is pushed or drawn aside,) upon the same principle as when for experiment's sake we intentionally roll the eye from side to side; the scene before us in either case remains visibly stationary, because the parts of the retina upon which each point of an object is successively delineated, are in their turn brought opposite to the same point in space.

The action of the retina is a vital one, the mechanism of which is completely unknown; it being the surface on which the refracted rays are converged to a focus, for the purpose of conveying an impression to the brain. The retina receives the impression of light when it is within certain limits of intensity.

When the eye is steadily directed to objects illuminated by a very faint gleam of light, it is thrown into a state of painful agitation. A kind of remission takes place in the conveyance of the
impressions along the nervous membrane; the object actually disappears, and the eye is agitated by the recurrence of impressions which are too feeble for the performance of its functions.

When too strong a light has suddenly struck the retina, the impression is called *dazzling*, and the retina is incapable for a few moments afterwards of discovering the presence of light. This happens when we endeavour to look steadily at the sun. When we have been long in the dark, even a faint light causes dazzling. If the light which reaches the eye is extremely weak, and we endeavour to fix objects, the retina becomes very much fatigued, and we soon experience a painful sensation in the orbit, and even in the head.

When we look intensely at any object in order to examine it with care and attention, we direct to that point the axis of the eye, and consequently, the image of that point falls upon the central hole in the retina; every other point of the same object is seen indistinctly, and the indistinctness increases with the distance of the point from that which is seen distinctly. The centre of the retina, therefore, appears to enjoy a more lively sensibility than the rest, and it is upon this part we throw the image, when we wish to examine an object with attention. This is not, however, confined to the axis of vision; for in certain positions of the eye, artificially induced, we have a clear perception of an object, from which the rays pass so obliquely, as to fall upon the retina not in the axis of vision.

It was discovered by M. Mariotte, that when the image of any external object fell upon the base of the optic nerve, it instantly disappeared. In order to prove this, we have only to place upon the wall, at the height of the eye, three wafers, two feet distant from each other: shutting one eye, stand opposite to the middle wafer, and while looking at the outside wafer, on the same side as the shut eye, retire gradually from the wall till the middle wafer disappears. This will happen at about five times the distance of the wafers, or ten feet from the wall; and when the middle wafer vanishes, the two outer ones will be distinctly seen. If candles
are substituted for wafers, the middle candle will not disappear, but it will become a cloudy mass of light. If the wafers be placed upon a coloured wall, the spot occupied by the wafer will be covered by the colour of the wall, as if the wafer itself had been removed. From this we learn, that there is a certain part of the retina less sensible to ordinary impressions of light; further, this part may be shewn to be the base of the optic nerve, which is about the eighth of an inch in diameter.

This circumstance induced Mariotte to consider the choroid as the seat of vision rather than the retina; for, argued he, there is no deficiency of that nervous matter of which the retina is an expansion, but the choroid is wanting. The opacity of the choroid coat and the transparency of the retina, which rendered it an unfit ground for the reception of images, were arguments in favour of this opinion. Comparative anatomy furnishes us with another argument, perhaps even more conclusive than any of those urged by Mariotte. In the eyes of the sepia loligo, or cuttle fish, an opaque membranous pigment is interposed between the retina and the vitreous humour; so that, if the retina is essential to vision, the impressions of the image on this black membrane must be conveyed to the retina by the vibrations of the membrane in front of it. Now, since the human retina is transparent, it will not prevent the formation of images on the choroid; and the vibrations which they excite in this membrane, being communicated to the retina, will be conveyed to the brain. These views are strengthened by another fact of some interest. Sir D. Brewster has observed in young persons, that the choroid coat (which is generally supposed to be black, and to grow fainter by age) reflects a brilliant crimson colour, like that of dogs and other animals. Hence, if the retina is affected by rays which pass through it, this crimson light, which must necessarily be transmitted by it, ought to excite the sensation of crimson, which I find not to be the case.

The correctness of Mariotte’s conclusions, on which this singular theory is founded, is extremely questionable. If, in his fundamental experiment of the three wafers, we substitute three candles,
we then find, that though no image of the centre object is formed at this part, it is still not insensible to light, for a diffused reddish light appears to occupy the place of the flame. The base of the optic nerve therefore is not insensible to light, as Mariotte's hypothesis supposes; it is only unfit for giving distinct vision of those objects whose images fall upon it, in consequence of being placed on the projection of the central artery which accompanies it. The red nimbus results from the passage of light through this blood-vessel, the irregularity of which prevents it from transmitting the image.

A French writer, M. Lehot, has recently written a work endeavouring to prove that the seat of vision is in the vitreous humour; and that, in place of seeing a flat picture of the object, we actually see an image of three dimensions, with length, breadth, and thickness. To produce this effect, he supposes that the retina sends out a number of small nervous filaments, which extend into the vitreous humour, and convey to the brain the impressions of all parts of the image. If this theory were true, the eye would not require to adjust itself to different distances; and we besides know for certain, that the eye cannot see with equal distinctness two points of an object at different distances, when it sees one of them perfectly. M. Lehot might indeed reply to the first of these objections, that the nervous filaments may not extend far enough into the vitreous humour to render adjustment unnecessary; but if we admit this, we would be admitting an imperfection of workmanship, in so far as the Creator would then be employing two kinds of mechanism to produce an effect which could have been easily produced by either of them separately.

Such are the theories that have been entertained respecting the seat of vision, and as difficulties still attach to every opinion respecting the seat of vision, we shall still adhere to the opinion most generally adopted; that the images of objects are painted upon the retina.

-When the eye is directed to any point of a landscape it sees with perfect distinctness only that point of it which is directly in
the axis of the eye, or the image of which falls upon the central hole of the retina. But, though we do not see any other point but one with that distinctness which is necessary to examine it, we still see the other parts of the landscape with sufficient distinctness to enable us to enjoy its general effect. The extreme mobility of the eye, however, and the duration of the impressions made upon the retina, make up for this apparent defect, and enable us to see the landscape as perfectly as if every part of it were seen with equal distinctness.

The indistinctness of vision for all objects situated out of the axis of the eye increases with their distance from that axis; so that we are not entitled to ascribe the distinctness of vision in the axis to the circumstance of the image being formed on the central hole of the retina, where there is no nervous matter; for if this were the case, there would be a precise boundary between distinct and indistinct vision, or the retina would be found to grow thicker and thicker as it receded from the central hole, which is not the case.

In making some experiments on the indistinctness of vision at a distance from the axis of the eye, Sir D. Brewster was led to observe a very remarkable peculiarity of oblique vision. If when one eye is shut, we fix the other upon a point, such as the head of a pin stuck into a green cloth, and continue for some time looking at the pin-head, we shall see indistinctly all other objects within the sphere of vision. Let one of these objects be a strip of white paper or a pen lying upon a green cloth. After a short time, the strip of paper or pen will disappear altogether, as if it were entirely removed, the impression of the green cloth upon the surrounding parts of the eye extending itself over the part of the retina which the image of the pen or paper occupied. In a short time, the vanished image will reappear, and again vanish. The same effect is produced when both eyes are used; and when the object is highly luminous, like a candle, it does not wholly disappear, but expands itself into a mass of nebulous light, which is of a blue colour, encircled with a bright ring of yellow light.
From these results it appears that oblique or indirect vision is inferior to direct vision, not only in distinctness, but from its inability to preserve a sustained vision of objects; but though thus defective, it possesses a superiority over direct vision in giving us a more perfect vision of minute objects, such as small stars, which cannot be seen by direct vision. This has been observed by several astronomers, both with regard to faint stars and to the satellites of Saturn. When the eye is turned full upon the star or satellite, it disappears; but when it is directed to another part of the field of the telescope, the luminous point will become distinctly visible. The following explanation of this singular phenomenon has been offered by Sir D. Brewster. A luminous point seen by direct vision, or a sharp line of light viewed steadily for a considerable time, throws the retina into a state of agitation highly unfavourable to distinct vision. If we look through the teeth of a fine comb held close to the eye, or even through a single aperture of the same narrowness, at a sheet of illuminated white paper, or even at the sky, the paper or the sky will appear to be covered with an infinite number of broken serpentine lines, parallel to the aperture, and in constant motion; and as the aperture is turned round, these parallel undulations will turn round also. These black and white lines are obviously undulations on the retina, which is sensible to the impressions of light in one phase of the undulation, and insensible to it in another phase. An analogous effect is produced by looking stedfastly, and for a considerable time, on the parallel lines which represent the sea in certain maps. These lines will break into portions of serpentine lines, and all the prismatic tints will be seen included between the broken curvilinear portions. A sharp point or line of light is therefore unable to keep up a continued vision of itself upon the retina when seen directly.

Now, in the case of indirect vision, we have already seen that a luminous object does not vanish, but is seen indistinctly, and produces an enlarged image on the retina, beside that which is produced by the defect of convergence in the pupils. Hence a star
seen indirectly, will affect a larger portion of the retina from these two causes, and losing its sharpness, will be more distinct.

These peculiarities of the retina with regard to vision, are, without doubt, the source of many optical deceptions, which have been ascribed to supernatural origin. In a dark night, when objects are feebly illuminated, their disappearance and reappearance must seem very extraordinary to a person, whose fear or curiosity calls forth all his powers of observation. This defect of the eye must have been often witnessed by the sportsman in attempting to mark, upon the monotonous heaths, the particular spots where moor-game had alighted. Availing himself of the slightest difference of tint in the adjacent heaths, he endeavours to keep his eye steadily upon it as he advances; but whenever the contrast of illumination is feeble, he almost always loses sight of his mark, or if the retina does take it up a second time, it is only to lose it again.

Every body must have observed that when we whirl a burning stick in the hand, a circle of light is seen marking out the parts described by its burning end. As the burning extremity can only be in one point of the path at the same instant, it is manifest that the impression of its light continues some time on the eye. In like manner, during the twinkling of the eye, or rapid closing of the eyelids for the purpose of diffusing the lubricating fluid over the cornea, we never lose sight of the objects we are viewing. The most instructive experiment, however, on this subject, and one which it requires a good deal of practice to make well, is to look for a short time at the window at the end of a long apartment, and then quickly direct the eye to the dark wall. In general, the ordinary observer will see a picture of the window, in which the dark bars are white and the white panes dark; but the practised observer, who makes the observation with great promptness, will see an accurate representation of the window with dark bars and bright panes; but this representation is instantly succeeded by the complementary picture, in which the bars are bright, and the panes dark. M. D'Arcy found that the light
of a live coal, placed at the distance of 165 feet, maintained its impression on the retina during the seventh part of a second. A friend of mine after viewing a brilliant gas light for some time, on going into a dark cellar, observed a distinct coloured spectrum of the gas light on the opposite wall, which lasted upwards of three minutes. From these facts we learn, therefore, that the effect of light upon the retina continues for some time; and that the period of its duration is proportionate to its primary intensity.

Hitherto we have considered sight in reference to vision with a single eye; but habitually we employ both eyes. How happens it, then, that impressions made upon our two eyes at one and the same time are represented single to the sensorium? Of this, in the opinion of Mr. Travers, we know as little as why we hear one sound with two ears, and smell one scent with two nostrils. He considers that the mind is incapable of receiving two distinct impressions at the same instant; and that the simple experiment of Haller affords unexceptionable evidence of the fact, that we employ our eyes severally, and not at the same instant, in distinct vision, though the interval is too small to be measurable.

It is interesting to enquire what are the conditions which render vision under these circumstances single or double. It is to be borne in mind that the centre of the retina, from whatever cause it proceed, furnishes the most distinct vision. Hence, in looking at a point of an object, we invariably direct the axis of the eye towards it; and when we look with one eye at a succession of objects placed in a line directly before us, but at different distances, the optic axis is seen to incline inwards when we regard the nearest object, and to increase its direction outwards as we view those which are more remote.

Now when we look with both eyes at any one of such a series of objects, it appears single, the rest appear double. This familiar but remarkable phenomenon has given rise to the hypothesis that there are corresponding points in either retina; it is supposed that
when an object is delineated upon those points of the two retinae which are naturally associated, it appears single, and double under other circumstances. But it seems unnecessary to resort to this explanation of the fact. There is no doubt that, in one sense, we really see two objects, but these objects appear as one, in consequence of the one occupying exactly the same place as the other. Single vision with two eyes, or with any number of eyes, if we had them, is the necessary consequence of the law of visible direction. It has been already shewn that objects are seen in a definite direction; by the action of the external muscles of the eyeballs, the axis of each eye can be directed to any point of space at a greater distance than four or six inches. When therefore it happens, that the visual direction of an object is the same or nearly the same for both eyes, that object appears single; when different, the object appears double. In both cases two objects are seen, but in single vision they are seen in the same place, and therefore necessarily appear to form but one; the images coincide, and are therefore essentially indistinguishable. If, for example, we look at an aperture in a window shutter, we know that an image of it is formed in each eye; but as the line of visible direction from any point in the one image meets the line of visible direction from the same point in the other image, each point will be seen as one point, and, consequently, the whole aperture seen by one eye will coincide with or cover the whole aperture seen by the other. Were any thing further wanting, to prove the correctness of this theory, the phenomena of double vision present themselves.

If the axes of both eyes are directed to a point beyond the window, or to a point within the room, the aperture will then appear double, because the line of visible direction from the same points in each image do not meet at the aperture. If when an object is seen single with both eyes, we press one eye aside, the image formed by that eye will separate from the other image, and the object will appear double: by pressure with the finger we may
raise or depress one eyeball, when the object seen by that eye appears to shift its place, as the position of the organ is varied. It is easy, therefore, by a very simple artifice, to render vision double. The effect which is thus produced at will in an experiment, sometimes occurs as the result of disease. M. Majendie mentions the case of a gentleman in whom, from palsy of the third nerve, the left eye is permanently drawn outwards; the consequence of which, he observes, is, that with that eye the patient sees objects in their wrong places, "déplacés de vingt à vingt cinq dégrés à droite de leur position." The case is curious, but not without its parallel, and the account of the result of the displacement of the eye is incorrect. It is not true that the object is seen by the averted eye out of its true position; the proof of which is, that an eye thus affected, or similarly pushed aside for experiment's sake, will take as true an aim as before, or look along a line as justly towards a remote object. The object is seen apparently in two places, yet both eyes see truly. This paradoxical circumstance renders evident one of the most curious provisions in our frame, namely, the extreme nicety with which the two eyes are coadjusted, so that their impressions may exactly tally. If the muscles of either of the eyes are unable to direct the two axes of the eyes to the same point, the object will in that case also appear double. This inability of one eye to follow the motions of the other, is frequently the cause of squinting, as the eye which is, as it were, left behind, necessarily looks in a different direction from the other. The same effect is often produced by the imperfect vision of one eye, in consequence of which the good eye only is used. Hence the imperfect eye will gradually lose the power of following the motions of the other, and will therefore look in a different direction.

A remarkable circumstance attending binocular vision, which was observed by Mr. Wheatstone, is the following. A solid object being placed so as to be regarded by both eyes, projects a different perspective figure on each retina; now if these two perspectives be accurately copied on paper, and presented one to
each eye, so as to fall on corresponding parts, the original solid figure will be apparently reproduced in such a manner, that no effort of the imagination can make it appear as a representation on a plane surface. This and numerous other experiments explain the cause of the inadequacy of painting to represent the relief of objects, and indicate a means of representing external nature with more truth and fidelity than have yet been obtained.

Every object at which we look must have a definite visual magnitude, inasmuch as the apparent size of an object must exactly depend upon the space which its outline occupies upon the retina. Now the same object at different distances will, it is easily shewn, occupy a larger or a smaller area in the retina. The nearer it is, the larger will be that area; the more remote, the less. Here, then, is a provision by means of which we may learn to judge of the relative distance of a known object. But does the eye possess any absolute power of determining the actual distance, magnitude, and position of objects? It would appear, from the following interesting case, recorded by Cheselden, that such knowledge is relative, and results from the experience derived from the combined agency of the senses of sight and touch. This philosophic surgeon, after performing the operation of couching, studied the effect of the first visual impression upon his patient, which he describes in the following words:—

"This young gentleman either had been born blind, or had lost his sight so early that he had no remembrance of ever having seen: the blindness arose from a cataract, or opaque crystalline lens in both eyes. Like other persons who have ripe cataracts, he was not so blind but that he could discern day from night, and for the most part, in a strong light, distinguish black, and white, and scarlet. When he first saw, he was so far from making any judgment about distances, that he thought all objects whatever touched his eye, (as he expressed it,) as what he felt touched his skin. He knew not one thing from another, however different in shape or magnitude: but upon being told
what those things were, whose form he knew before from feeling, he would carefully observe that he might know them again. Two months after being couched, his attention seems to have been drawn to the effects of painting, which he then first and at once comprehended; but even then he was no less surprised, expecting the pictures would feel like the things they represented, and was amazed when he found those parts, which by their light and shadow appeared round and even, felt only flat like the rest; and asked which was the lying sense, feeling or seeing?

"Being shewn a small miniature of his father, and told what it was, he acknowledged a likeness, but was vastly surprised, asking how it could be that a large face could be expressed in so little room, saying it should have seemed as impossible to him, as to put a bushel into a pint. At first he could bear but very little light, and the things he saw he thought extremely large, but upon seeing things larger, those first seen he conceived less, never being able to imagine any lines beyond the bounds he saw. The room he was in, he said, he knew to be but part of the house, yet he could not conceive that the whole house could look bigger. Before he was couched, he expected little advantage from seeing, worth undergoing an operation for, except reading and writing; for he said, he thought he could have no more pleasure in walking abroad than he had in the garden, which he could do very safely and readily; and even blindness, he observed, had this advantage, that he could go anywhere in the dark much better than those who can see; and after he had seen, he did not soon lose this quality, nor desire a light to go about the house in the night. He said every new object was a new delight, and the pleasure was so great that he wanted ways to express it; but his gratitude to Mr. Cheselden he could not conceal, never seeing him for some time without tears of joy and other marks of affection. A year after first seeing, being carried upon Epsom Downs, and observing a large prospect, he was exceedingly delighted with it, and called it a new kind of seeing. And now,
being lately couched of his other eye, he says that objects at first appeared large to this eye; but not so large as they did at first to the other; and looking upon the same object with both eyes, he thought it looked about twice as large as with the first couched only, but not double that he can anyways discover."

From these details we learn, that originally we derive no information respecting either the distance or real magnitude of bodies from the sense of sight, and that there is no essential resemblance between the ideas communicated by vision and by feeling. The infancy of man's existence is employed in learning to interpret the visible signs of external objects. For this purpose, as soon as there is intelligence in an infant's gaze, it extends its hands to touch and examine each object in succession which attracts its notice.

The eye has no original measure for distance, and gives us no certain notion of real magnitude. When the eye is fixed upon a point on the wall of a narrow chamber, or in the vault of heaven, it seems to command an oval or circular area of equal visual dimensions; a foot rule, under these circumstances, held at the distance before the eye, measures equally the side of the room, or a segment of the firmament.

When the actual size of an object is unknown to us, and we look at it, if at a certain degree of remoteness, with both eyes, or if near, with one eye only, we judge of its distance by the greater or less indistinctness of its outline and colour. We judge of its real magnitude by calculation founded upon its apparent size and probable distance. Hence we are liable to continual mistakes on these points. An Englishman, in the clear atmosphere of Italy, supposes distant objects to be nearer to him than they are. We think the moon larger when near the horizon, than when above our heads; near the horizon the moon is more dim, we therefore by analogy suppose her more remote; but her visual diameter being really the same, we therefore are persuaded that her disk is broader.

We judge very differently of the distance of bodies accord-
ing to its degree; we judge correctly when they are near, not when they are distant; then our judgments are frequently er-
roneous, but when objects are very distant, we are constantly in error.

The united actions of both eyes is absolutely necessary in judging correctly of distance, as the following experiment will prove. Suspend a ring by a thread, and fix a hook capable of entering it easily, to the end of a long stick; place yourself at a proper distance, and endeavour to put the hook into the ring; if you use both eyes, you will succeed every time; if you shut one eye, you will not, the hook will go too far, or fall short of the ring, and you will succeed only by chance, and after much blundering; persons with eyes of unequal power, do not succeed, even when they use both eyes.

If a person by accident lose an eye, he will sometimes be a year before he can judge correctly of the distance of bodies placed near him. In general, persons with but one eye judge imperfectly of distance. The size of the object, the intensity of its light, the presence of intermediate bodies, considerably influence our judgment of distance.

Our judgment is much more exact when objects are on the same level with ourselves. Thus, when we look from the top of a tower upon objects below, they seem much smaller than they appeared at the same distance, when on the same level with our-

selves. It is the same when we look at objects placed above. Hence the necessity of giving a considerable size to objects intened to be placed on the top of edifices, and seen at a distance. The smaller the dimensions of a body are, the nearer it must be placed to the eye to be seen distinctly. We see a horse distinctly at the distance of ten metres, but should not even descry a bird at that distance. If I wish to examine a hair or a feather of these animals, the eye requires to be very near. However, the same object may be seen distinctly at very different distances; for instance, it is indifferent to many persons, whether they place the book which they are reading at the distance of one or two feet.
from their eyes; the intensity of the light which illuminates an object has much influence upon the distance at which it can be seen distinctly.

The manner in which we arrive at a correct judgment of the size of bodies, depends more upon the understanding and upon habit, than even upon the apparatus of vision.

We form our judgments relative to the dimensions of bodies, from the size of the image formed at the bottom of the eye, the intensity of the light which proceeds from the object, the distance at which we suppose it placed, and especially from our habit of beholding similar objects. For this reason we judge with difficulty of the size of a body which we see for the first time, when we do not consider its distance. A distant mountain, when first seen, generally appears much smaller than it really is; hence, we believe ourselves near it, when in fact we are at a great distance.

Beyond a certain very considerable distance, we fall into an inevitable delusion; objects appear infinitely smaller than they really are; this happens with respect to the heavenly bodies.

We judge of the motion of a body by that of its image upon the retina, and by the variations of the size of this image, or, what comes to the same thing, by the change of the direction of the light which reaches the eye. For us to be able to follow the motion of a body, it must not move too rapidly, for then we should not perceive it, as happens in projectiles sent by gunpowder, especially when they pass near us. When they move at a distance from us, as they send light to the eye for a long time because the field of vision is larger, we easily perceive them. To judge correctly of the motion of bodies, we must not be in motion ourselves.

It is difficult to observe the motions of bodies at a distance. In fact, we judge of their motion, in this case, only by the variation in the size of the image. But as this variation, at a considerable distance, is very small, it is very difficult, or even sometimes impossible, for us to estimate it. In general, we discover with dif-
ficulty slow motions of bodies; whether this effect depends upon the absolute slowness of motion, as in the case of the hour-hand of a watch, or results from the slowness of the motion of the image on the retina, as happens with the fixed stars, or very distant objects.

When the eye sees objects distinctly at a great distance, it is unable, without some change, to see objects distinctly at a less distance. This will readily be seen by looking between the fingers at a distant object. When the distant object is seen distinctly, the fingers will be seen indistinctly; and if we look at the fingers so as to see them distinctly, the distant object will be quite indistinct.

It must be evident, then, that the rays of light which issue from an object at some distance from the eye, and those issuing from a much nearer object, cannot be collected into foci at the same given distance behind the crystalline lens, unless the eye have a power of altering its focal length. We know, moreover, that perfect vision is produced, only when the focal point is situate upon the retina: vision at different distances, therefore, cannot occur, unless the eye possesses a power of focal adjustment. The mechanism by which this focal adjustment is effected still remains in obscurity, notwithstanding the numerous attempts that have been made to explain it.

I shall content myself with a very brief mention of the principal hypotheses to explain the adjusting action. To enumerate all with barely intelligible conciseness, would occupy a larger space than can be devoted to the subject. It has been ascribed to a change of figure in the cornea,—to the variations in the diameter of the pupil,—to a change of figure of the globe by the action of its muscles,—to a change of figure of the lens by an action proper to itself,—to a change of place of the lens by the contraction of the ciliary processes and the compression of the vitreous humour at its circumference.

The first supposes a close aponeurotic expansion derived from the tendons of the recti muscles, bracing the anterior segment of Accommodation of the eye to different distances.

Various hypotheses.
the globe; the second assumes the musculature of the iris, or the extension of its texture, by the sudden injection of its vessels, and vice versa; its abridgment by their contraction; the fourth attributes musculature to the crystalline; and the fifth attributes a similar structure to the ciliary processes.

An experiment made by Dr. Young, contravenes the supposition, that the change produced consists in an alteration of the form of the cornea. A convex lens fixed in a socket, which contained water, and the edges of which were secured with wax, was applied to the eye, so that the cornea entered half way into the socket, and was everywhere in contact with the water; the eye immediately became presbyopic; but upon the addition of another convex lens to make up for the loss of the convexity of the cornea, vision was restored to its natural state, and the eye regained the power of adjustment.

The only evident change in the eye, when adjusting its focal length to different distances, is an alteration in the diameter of the pupil. The pupil enlarges when a distant object is seen, and diminishes when we look at a nearer point. Upon a superficial analogy we might conclude that these changes are sufficient to produce the requisite alterations of the focal length of the eye: for by viewing objects through a series of pin-holes in a card, the largest smaller than the aperture of the pupil, and each of the rest in succession smaller than the last, the eye is rendered capable of seeing distinctly at the distance of four, of three, and even two inches. When, however, the correctness of hypothetical explanation is put to the test of direct experiment, it proves to be fallacious. 1st. Sir D. Brewster ascertained, by direct experiment, that a variation in the aperture of the pupil, produced artificially, is incapable of producing adjustment. 2d. The following experiments of Professor Mayo may be adduced in confirmation. "A room was darkened by half closing the shutters, and I attentively observed the state of the pupil, when Mr. Robinson directed his eye to a definite point upon the optometer: the pupil was of course considerably dilated: the shutters being opened, the pupil instantly contracted, but the point
upon the optometer at which the lines crossed, did not shift its place.

"When by some practice I had accustomed my own eye to the range of the optometer, I compared its range in the brightest and in the obscurest light in which the lines were visible, and observed no apparent difference in the two cases. Mr. Robinson made a similar observation. Either of these experiments proves that the change in the size of the pupil is not the means by which the adjustment of the eye to distances is effected. But an additional fact may be mentioned. In an old lady of sixty-seven, whose sight in early youth was remarkably good, but whose eyes can now only bring to a focus parallel rays, the pupil retains its mobility perfectly under variations of light, and even sensibly moves upon her making ineffectual attempts to read without spectacles a page held at different distances from her."

As an elongation of the eye would alter the curvature of the retina, and consequently the centre of visible direction, and produce a change of place in the image, we consider it quite untenable to suppose that the focal adjustment is effected by an alteration in the figure of the eyeball.

Dr. Young himself concludes that the means of adjustment consist in a change of form in the crystalline, the fibres of which he describes, and which he supposes to be irritable. But it does not appear from direct experiment that the crystalline possesses irritability; and if faith can be attached to a single well attested observation upon a point so delicate, the instance of Henry Miles, recorded by Sir Everard Home, proves that the eye may retain its power of adjustment after the removal of this humour.

The following inferences, which are the result of some experiments by Sir D. Brewster on this subject, appear to be most entitled to our consideration.

1st: The contraction of the pupil, which necessarily takes place when the eye is adjusted to near objects, does not produce distinct vision by the diminution of the aperture, but by some other action which necessarily accompanies it.
2d. That the eye adjusts itself to near objects by two actions; one of which is voluntary, depending wholly on the will, and the other involuntary, depending on the stimulus of light falling on the retina.

3d. That when the voluntary power of adjustment fails, the adjustment may still be effected by the involuntary stimulus of light.

Reasoning from these inferences, and other results of experiment, it seems difficult to avoid the conclusion that the power of adjustment depends on the mechanism which contracts and dilates the pupil; and as this adjustment is independent of the variation of its aperture, it must be effected by the parts in immediate contact with the base of the iris. By considering the various ways in which the mechanism at the base of the iris may produce the adjustment, it appears to be almost certain that the lens is removed from the retina by the contraction of the pupil.

When the eye loses the power of accommodating itself to near objects, the person is long-sighted or presbyopic. This is owing to a diminution in the refracting power of the humours of the eye, on which account the rays of light from near objects, having a tendency to diverge, are not brought to a focal point upon the retina, but would, if continued on, come to a point some distance behind it: while rays from distant objects, being more nearly parallel, are capable of being brought to a focal point upon the retina. Presbyopia, according to some, is owing to a diminution in the quantity of the aqueous humour causing a diminished convexity of the cornea; according to others, it is due to a mechanical change in the state of the crystalline lens, by which its density and refractive power are altered. This change takes place most frequently at a particular part in the margin of the lens, and takes several months to go round. "If the human eye," says Sir D. Brewster, "is not managed with peculiar care at this period, the change in the condition of the lens often runs into cataract, or terminates in a derangement of fibres, which, though not indicated by white opacity, occasions imperfections of vision that are often mistaken for amaurosis, and other diseases. A skilful oculist, who thoroughly understands the
structure of the eye, and all its optical functions, would have no difficulty, by means of nice experiments, in detecting the very portion of the lens where this change has taken place; in determining the nature and magnitude of the change which is going on; in applying the proper remedies for stopping its progress; and in ascertaining whether it has advanced to such a state that aid can be advanced from convex or concave lenses. In such cases lenses are often resorted to before the crystalline lens has suffered an uniform change of figure or density, and the use of them cannot fail to aggravate the very evils which they are intended to remedy. In diseases of the lens, where the separation of fibres is confined to small spots, and is yet of such magnitude as to give separate coloured images of a luminous object, or irregular halos of light, it is often necessary to limit the aperture of the spectacles, so as to allow the vision to be performed by the good part of the crystalline lens.

It is easy, artificially, to obviate this defect of vision, when it is not accompanied by disease, by the employment of convex lenses, which, by compensating the diminished refractive powers of the humours, enables the eye to converge the pencils of light flowing from near objects to distinct foci on the retina.

When the eye is not able to see distant objects, and requires to bring minute objects very near it in order to be distinctly seen, the person is said to be myopic or short-sighted. This condition of vision is owing to the refracting powers of the humours being too great. The result is that parallel rays of light entering the pupil are brought to a focus before they reach the retina; and having crossed, and begun to disperse again, are spread upon the retina in a circle instead of a point; and therefore the picture on the retina is indistinct. This imperfection often appears in early life, and arises from an increase of density in the central parts of the crystalline lens, or to an increased convexity of the cornea, owing to the presence of an undue quantity of the aqueous humour. By using a suitable concave lens, the convergence of the rays is delayed, so that the excessive refraction is corrected.
The phenomena of ocular spectra or images of luminous objects remaining upon the retina after the external impression is withdrawn, are highly interesting and curious. Luminous sparks and flashes, halos or variously coloured rings, it is well known, are produced at will by friction or pressure of the closed eyelids, and the first are an instant effect of concussions of the brain. The red is that colour called up by the rudest artificial pressure; the violet by the slightest; and the gentlest impulse is the natural one, in which the light suffers no decomposition. Are these appearances really retinal impressions, or illusory mental phantoms, founded on the feeble and obscure analogy subsisting between mechanical pressure and the impression of light? Although blind persons perceive such appearances, it is doubtful if they ever present themselves in cases where the retina is disorganized, or after the extirpation of the eyeball, as the mutilated feel their fingers and toes. They seem therefore to establish the essential connexion between the retina and the faculty of perception, or the connexion between the corporeal and mental impressions; and this is confirmed by what we observe of morbid spectra, which are symptoms of various disordered states of the retina to be treated of hereafter.

If the retina be fatigued by fixing the eye upon a coloured spot strongly illuminated, for some seconds, upon averting it the field of vision appears haunted by a spot of the size of that recently looked at, but of a different colour. If the experiment be repeated with different colours, the eye being directed, after each trial, to a perfectly white surface, the colour of the spectrum is found to have an invariable relation to the colour of the spot by which the eye has been fatigued. The secondary colour is called the convertible or accidental colour of the first.

In order to find the accidental colour of any colour in the spectrum, take half the length of the spectrum in a pair of compasses, and having set one foot in the colour whose accidental colour is required, the other foot will fall upon the accidental colour. This law of accidental colours, derived from observation, may be thus expressed: the accidental colour of any primitive colour, is that
colour which in the prismatic spectrum is distant from the primitive colour half the length of the spectrum.

If we suppose the primitive colour to be reduced to the same degree of intensity as the accidental colour, then we shall find that the one is the complement of the other, or what the other wants to make it white light, that is, the primitive and the accidental colour when mixed together will make white light. Hence the accidental colours have also been called complementary colours. Since a mixture of all the colours of the spectrum forms white light, it is obvious, that if one is left out, the mixture of the remainder will not be white light but some other tint. This other tint is found to be nearly that which corresponds to the centre of gravity of all the other colours which are left. So that if we arrange the colours of the spectrum in a circle, which is nothing more than the prismatic spectrum bent round till its two ends meet, we shall see that the centre of gravity of the colours which remain after one colour is omitted, must necessarily be opposite to the omitted colour, that is, the complementary colour is found in the same way as the accidental colour. Thus, if the red is omitted, the centre of gravity of the remaining arch will be in the blue.

With the aid of these facts, the theory of accidental colours will be readily understood. When the eye has been for some time fixed on the red wafer, the part of the retina occupied by the red image is strongly excited, or as it were deadened by its continued action. The sensibility to red light will therefore be diminished; and, consequently, when the eye is turned from the red wafer to the white paper, the deadened portion of the retina will be insensible to the red rays which form part of the white light from the paper, and consequently will see the paper of that colour which arises from all the rays in the white light of the paper but the red; that is of a bluish green colour, which is therefore the true complementary colour of the red wafer. When a black wafer is placed on a white ground, the circular portion of the retina, on which the black image falls, in place of being deadened, is protected by the absence of light, while all the surrounding parts of the retina, being excited
by the white light of the paper, will be deadened by its continued action. Hence, when the eye is turned upon a white ground, it will see a portion whiter than the rest, so that the accidental colour of black is white.

Such are the phenomena of accidental colours when weak light is employed; but when the eye is impressed powerfully with a bright white light, the phenomena have a different character. The first person who made this experiment with any care was Sir Isaac Newton, who sent an account of his experiments to Mr. Locke, but they were not published till 1829. Many years before 1691, Sir Isaac, having shut his left eye, directed the right one to the image of the sun reflected from a looking-glass. In order to see the impression which was made, he turned his eye to a dark corner of the room, when he observed a bright spot made by the sun, encircled by rings of colours. This "phantom of light and colours," as he calls it, gradually vanished; but whenever he thought of it, it returned, and became as lively and vivid as at first. He rashly repeated the experiment three times, and his eye was impressed to such a degree, "that whenever I looked upon the clouds, or a book, or a bright object, I saw upon it a round bright spot of light like the sun: and, which is still stranger, though I looked upon the sun with my right eye only, and not with the left, yet my fancy began to make an impression on my left eye as well as upon my right; for if I shut my right eye, or looked upon a book or the clouds with my left eye, I could see the spectrum of the sun almost as plain as with my right eye." The effect of this experiment was such, that Sir Isaac durst neither read nor write, but was obliged to shut himself completely up in a dark chamber for three days together; and by keeping in the dark, and employing his mind about other things, he began in about three or four days, to recover the use of his eyes. This subject has been still further investigated by Æpinus; and since then Sir D. Brewster, who examined the brilliant image of the sun's disk formed by a concave reflector. With his right eye tied up, he viewed this luminous disk with the left through a blackened tube, to prevent any extraneous light from
falling upon the retina. When the retina was highly excited by this intense light, he turned his left eye to a white ground, and perceived the following spectra by alternately opening and shutting the eye.

<table>
<thead>
<tr>
<th>Spectra with the left eye open</th>
<th>Spectra with the left eye shut</th>
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</thead>
<tbody>
<tr>
<td>1. Pink surrounded with green.</td>
<td>Green.</td>
</tr>
<tr>
<td>2. Orange mixed with pink.</td>
<td>Blue.</td>
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</tbody>
</table>

Upon uncovering his right eye, and turning it to a white ground, he was surprised to find that it also gave a coloured spectrum, exactly the reverse of the first spectrum, which was pink with a green border. The reverse spectrum was green with a pinkish border. This experiment was repeated three times, and always with the same results; so that it would appear that the impression of the solar image was conveyed by the optic nerve from the left to the right eye.

The phenomena of accidental colours are often finely seen when the eye has not been strongly impressed with any particular coloured object. It was long ago observed by M. Meusnieser, that when the sun shone through a hole a quarter of an inch in diameter, in a red curtain, the image of the luminous spot was green. In like manner, every person must have observed, in a brightly painted room illuminated by the sun, that the parts of any white object on which the coloured light does not fall, exhibit the complementary colours. In order to see this class of phenomena, the following method appears the simplest and the best. Having lighted two candles, hold before one of them a piece of coloured glass, suppose bright red, and remove the other candle to such a distance that the two shadows of any body formed upon a piece of white paper may be equally dark. In this case one of the shadows will be red, and the other green. The same effect may be seen in
looking at the image of a candle reflected from the water in a blue finger glass; the image of the candle is yellowish; but the effect is not so decided in this case, as the retina is not sufficiently impressed with the blue light of the glass.

These phenomena are obviously different from those which are produced by coloured wafers; because, in the present case, the accidental colour is seen by a portion of the retina, which is not affected, or deadened as it were, by the primitive colour. A new theory of accidental colours is therefore requisite, to embrace this class of facts. The following is suggested by Sir D. Brewster.

"As in acoustics, where every fundamental sound is actually accompanied by its harmonic sound, so in the impressions of light, the sensation of one colour is accompanied by a weaker sensation of its accidental or harmonic colour. When we look at the red wafer, we are at the same time, with the same portion of the retina, seeing green; but being much fainter, it seems only to dilute the red, and make it as it were whiter, by the combination of the two colours. When the eye looks from the wafer to the white paper, the permanent sensation of the accidental colour remains, and we see a green image. The duration of the primitive impression is only a fraction of a second; but the duration of the harmonic impression continues for a time proportional to the strength of the impression. In order to apply these views to the second class of facts, we must have recourse to another principle; namely, that when the whole or great part of the retina has the sensation of any primitive colour, a portion of the retina, protected from the impression of the colour, is actually thrown into that state which gives the accidental or harmonic colour. By the vibrations probably communicated from the surrounding portions, the influence of the direct or primitive colour is not propagated to parts free from its action, except in the particular case of oblique vision formerly mentioned. When the eye, therefore, looks at a white spot of solar light, seen in the middle of the red light of the curtain, the whole of the retina, excepting the portion occupied by the image of the white, is in the state of seeing things green; and as the
vibrations which constitute this state spread over the portions of the retina upon which no red light falls, it will of course see the white circular spot green.

A very remarkable phenomenon of accidental colours, in which the eye is not excited by any primitive colour, was observed by Mr. Smith, surgeon, in Fochabers. If we hold a narrow strip of white paper vertically, about a foot from the eye, and fix both eyes upon an object at some distance beyond it, so as to see the slip of paper double, then if we allow the light of the sun, or the light of a candle, to act strongly upon the right eye, without affecting the left, which may be easily protected from its influence, the left hand strip of paper will be seen of a bright green colour, and the right hand strip of a red colour. If the strip of paper is sufficiently broad to make the two images overlap each other, the overlapping parts will be perfectly white and free from colour, which proves that the red and green are complementary. When equally luminous candles are held near each eye, the two strips of paper will be white. If when the candle is held near the right eye, and the strips of paper are seen red and green, then on bringing the candle suddenly to the left eye, the left hand image of the paper will gradually change to green, and the right hand image to red.

A singular affection of the retina, in reference to colours, is shown in the inability of some eyes to distinguish certain colours of the spectrum. Various cases have been described, in which persons capable of performing the most delicate functions of vision, are unable to distinguish particular colours, and what is very remarkable, this imperfection runs in families. Mr. Huddart mentions, in the Philosophical Transactions for 1777, the case of Mr. Harris, a shoemaker at Allonby, in Cumberland, who was unable from his infancy to distinguish the cherries of a cherry-tree from its leaves, in so far as colour was concerned. Two of his brothers were equally defective in this respect, and always mistook orange for grass green, and light green for yellow. Harris himself could only distinguish black and white. Another case of a Mr. Scott is described by himself in the Philosophical
Transactions for 1778; he mistook pink for a pale blue, and a full red for a full green. All kinds of yellows and blues, except sky blue, he could discern with great nicety. His father, his maternal uncle, one of his sisters, and her two sons had all the same defect. Mr. Harvey has described, in the Edinburgh Transactions, the case of a tailor, at Plymouth, whose peculiarity consisted in distinguishing with certainty only white, yellow, and grey: the solar spectrum he regarded as consisting only of yellow and light blue. He regarded indigo and Prussian blue as black. Mr. R. Tucker, son of Dr. Tucker, of Ashburton, mistakes orange for green; he cannot distinguish blue from pink, but always knows yellow. He describes the colours of the solar spectrum as follows:


Sir D. Brewster describes the case of a gentleman in the prime of life, who saw only two colours in the spectrum, viz., yellow and blue. Whenever the colours of the spectrum were absorbed by a reddish glass, excepting red and dark green, he saw only one colour, viz., yellow or orange, which he could not distinguish. When the middle of the red space was absorbed by a blue glass, he saw the black line with what he called the yellow on each side of it.

Our illustrious countrymen, Mr. Dugald Stewart, Dr. Dalton, and Mr. Troughton, experience the same inability to distinguish certain colours.

In almost all these cases, the different prismatic colours have the power of exciting the sensation of light, and giving a distinct vision of objects, excepting in the case of Dr. Dalton, who is said to be scarcely able to see the red extremity of the spectrum.
In these various cases, the persons are insensible to red light, and all the colours into which it enters. Dr. Dalton thinks it probable that the red light is, in these cases, absorbed by the vitreous humour, which he supposes may have a blue tint. If, which is probable, the choroid be essential to vision, we may ascribe the loss of red light, in certain eyes, to the retina itself having a blue tint. Sir J. Herschel attributes this state of vision to a defect in the sensorium, by which it is rendered incapable of appreciating exactly those differences between rays on which their colour depends. Should all these suppositions prove incorrect, we must, for the present, content ourselves with supposing that the retina is insensible to the colours at one end of the spectrum, just as Dr. Wollaston has proved the ears of certain persons to be insensible to sounds at one extremity of the scale of musical notes, while they are perfectly sensible to all other sounds.

The eye is one of the first parts formed. In the foetus they appear as two black spots; at seven months they are capable of modifying light, so as to form an image upon the retina; till this period the eyes could not fulfil the purposes of vision, because, till then, the pupil is closed by the membrana pupillaris. At seven months this membrane disappears; it is commonly said to split, but probably is absorbed. This too is the time when the foetus can live. Fetal eyes, however, are found, which at six, or even five months, offer no trace of this membrane.

There are some differences between the eye of the foetus and adult, but they are not very remarkable. In the foetus the sclerotic is finer, and even slightly transparent; the choroid is red without, and the black tint of its inner surface is less intense; the retina is proportionally more developed; the aqueous humour is more abundant, whence a greater projection of the cornea; lastly, the crystalline is far less consistent than in the adult. Before birth the eyelids are close, as if they were glued together.

As age advances, the quantity of the humours insensibly diminishes, till the adult period; after this it diminishes in a more
striking manner. This diminution is particularly evident in old age. The crystalline humour in particular becomes not only more dense, but inclines to a yellow colour, at first clear and afterwards deeper. While it undergoes this change, it acquires a greater hardness, and contracts a slight opacity, which may proceed with age till it amounts to a complete opacity.

The eye therefore is well adapted, in the new born infant, to act upon light, and images are formed upon the retina, as experience demonstrates. However, during the first month, the child gives no sign of being sensible to light; its eyes move but slowly, and in an uncertain manner; it is not even till towards the seventh week that it begins to give proofs of sensibility. A brilliant light only is at first capable of striking and interesting it; it seems pleased with looking at the sun; soon it becomes sensible to the mere light of day. It does not yet, however, distinguish any object; the first which strike it are red; and in general it prefers the strongest colours. At the end of some days, it fixes its attention upon bodies whose colours it can distinguish, but has no idea of distance or size. It stretches forth its hands to seize the most distant objects; and as the first of its wants is to feed itself, it carries to its mouth objects that it seizes, of whatever dimensions. Thus vision is very imperfect at the first period of life; but by practice, and especially by the conclusions, which the continual errors into which it falls, compel it to draw, its sight becomes perfected really by education.

Infants have been thought to see objects double or reversed; this, however, is clearly erroneous. It is also said, and with more reason, that as the refracting parts of the eye are more abundant, they ought to see objects smaller than they in fact are.

Vision soon acquires all the perfection of which it is susceptible, and in general undergoes no modification till towards the commencement of old age. Then it is that the change above mentioned in the humours of the eye tends to render it less distinct; but what renders it still weaker is the diminution of the sensibility of the retina.
Three causes combine to alter vision in the old man; first, the diminution of the quantity of the humours of the eye, a circumstance which, by diminishing the refracting power of the organ, makes the old man no longer able accurately to distinguish near objects. Secondly, the commencing opacity of the crystalline lens, which disorders vision, and tends, by increasing, to produce blindness, causing the disease known under the name of cataract. Thirdly and lastly, the diminution of the sensibility of the retina, or if you please, of the brain, which opposes the perception of impressions produced upon the eye, and leads to complete and incurable blindness.
ON

THE PATHOLOGY AND TREATMENT

OF

DISEASES OF THE EYE.

In treating of the diseases of the eye, I shall follow the same order which I adopted in describing its structure; and proceed to describe, first, the diseases of the facial appendages; secondly, those of its orbital appendages; thirdly, the inflammation of its membranes, and the consequences of such inflammation, beginning externally and proceeding inwards; fourthly, the various affections of the humours; and lastly, the various accidents to which the eyeball is liable, and certain malignant affections of the eye which render its extirpation necessary.

CHAPTER I.

THE FACIAL APPENDAGES.

SECTION I. CATARRHAL INFLAMMATION OF THE CONJUNCTIVA.

The eyelids are frequently subject to inflammation of a catarrhal nature; produced by the same causes that give rise to catarrhal inflammation of other mucous membranes; the attack being seated in the ciliary margins, in the mucous membranes which line them, and in the glandular bodies which form part of their substance.

The edges of the eyelids are, in the first place, red, hard, and extremely painful. The mucous surface of the lids is unnaturally red and vascular, and it assumes speedily a thickened and villous character, resembling, when the lids are everted, nearly the appearance of red velvet. The pain is very great, particularly when
the lids are moved, for then the inflamed surface rubs against the
globe of the eye, and if the membrane covering that is also in-
flamed, which is not unfrequently the case, the pain is so severe
that the patient keeps the lids closed, and carefully avoids all
attempts at moving or opening them. On the inside, a feeling of
stiffness and dryness is experienced, as if the lids would not
move easily over the globe, for the secretion of the mucous mem-
brane is, in the first instance, suppressed; but that uneasiness soon
gives way, because the secretion is in fact increased in quantity,
and becomes somewhat altered, assuming an opaque whitish
yellow appearance, approaching to that of a purulent fluid. The
glands which are situated on the external surface of the inflamed
membrane, participate in the inflammation, and the secretion from
them is either suppressed or altered in its quality, so that the
edges of the lids become agglutinated during sleep, occasioning
considerable difficulty in opening them when the patient awakes in
the morning. Such are the symptoms of the early inflammatory
stage.

Antiphlogistic measures are necessary in these cases. Apply leeches to the eyelids, and lotions and mild unctuous remedies to
the margins of the lids at night to prevent them from sticking
together, resorting also to such internal means as the state of the
patient may require.

SECTION II. PSOROPHTHALMY.

Psorophtalmy is an inflammation particularly of that part of
the conjunctiva which lines the lids, but it extends sometimes
over the whole of the conjunctiva covering the globe. This com-
plaint is often obstinate, and extremely difficult of cure: it extends
over the cornea, conjunctival lining of the palpebrae, the cheek
and nose; and, lastly, the globe of the eye becomes affected, if
this complaint be not checked. At the origin of this disease,
there is a glutinous matter secreted on the edge of the lids; ulcers
form; and there is often great difficulty in separating the lids
from one another. By this means matter lodges on the lids, and tends to keep up the irritation of the whole of the part. You not unfrequently see the redness extending down the whole of the cheek, and excoriation taking place on the cuticle.

If the inflammation spreads over the whole of the conjunctiva, the lachrymal sac becomes irritated, and effusion of tears over the cheek takes place on its surface. The inflammation is of the atonic kind, accompanied with that symptom, distinguishing strumous ophthalmia, intolerance of light, and a sensation as if there were some extraneous body in the eye, grit or sand, which gives rise to an effusion of the tears. The lids are very red on the edges, and there is an incrustation of matter on them. There is occasionally a contraction of the integument of the lower lid, by which it becomes depressed and everted. In this inflammation, the secretion deposited from the lids dries up, ulcers form, small briny incrustations are formed, and there is an appearance of tinea on the lids. The watery part of the secretion from the lids is evaporated, which leaves the incrustations that keep up the irritation and form small ulcers.

In consequence, an alteration in the figure of the tarsi occurs: there is a contraction of the cellular membrane just beneath the lower palpebrae, and eversion of that lid. This affection of the eye is of difficult management, and is frequently found in persons of a scrofulous diathesis, in children of large towns who are ill fed and worse clothed, with little attention paid to cleanliness. The complaint is very obstinate in its cure: and if relieved, it generally returns, and becomes as bad as ever. It is not, however, confined to the lower classes, but the higher and middling ranks of society are sometimes attacked with it—those who are of a scrofulous diathesis. In schools also it will be found: it frequently arises from the irritating matter being applied to the lid, which may be conveyed from one to another by using the same towel, or in some such way.

The treatment of this complaint does not essentially differ from that of the strumous: it is an inflammation without power, one of
the atonic kind. Depletion must not be pursued to any extent. It will be right when any symptoms of irritation are present, to remove them by the application of leeches, and opening the bowels. Drastic purgatives must not be exhibited, as they do not answer the object which it is intended to effect: mild aperients, combined with mercurial medicines, such as calomel, the hydrargyrum cum creta, or the blue pill, and in quantities so as to give tone to the system. When any febrile excitement that may have existed is removed, begin with tonic remedies: that is, when the skin has its natural feel, and the tongue is clean, and the secretions from the bowels are regular in their quantity and quality.

The applications to the part should consist of mild stimulants, and the best form in which they can be exhibited is that of ointment. The briny incrustations on the edges of the lid, and which are secreted from the meibomian follicles, confine the lids so closely together, that in the morning when the patient awakes they have the appearance of being glued together. This leads to produce increased irritation on the edges of the palpebrae. To prevent this, the lids are to be besmeared with some ointment. The one commonly used is that called the citron ointment, the unguentum hydrargyri nitratīs: but it cannot be well borne of the usual strength, and therefore is diluted with one-third, or one half, or perhaps more than this, of unguentum cetacei, and this is applied with a camel-hair brush twice a day, the incrustations of matter being carefully washed off before its application, and then some of the ointment is to be besmeared along the edges. The unguentum hydrargyri nitrico-oxydi is used for the same purpose. In fact, any of the milder stimulating mercurial ointments will do. The application will be required to be varied, and the degree of strength must be regulated by the effect on the eye. The use of the vinum opii will be attended with beneficial results, and the application of blisters will have an universally good effect.

In the use of blisters, however, in this complaint, as well as in strumous ophthalmia, no advantages will be derived from keeping them open; for when this is done, they are apt to give rise to fresh
irritation. Therefore, after the application of a blister, you should desire it to be healed; and, if necessary, direct a fresh one to be applied. By this means the irritation in the eyes will be relieved, and their employment be attended with advantage.

SECTION III. LIPPITODO.

In instances where inflammation of the palpebræ has frequently occurred, more particularly in old persons, and in those in whom the skin is very thin,—in whom the margins of the palpebræ have become much attenuated and very red, the hair of the palpebræ is lost, so that the edges of the lids have a rawness, which extends to a considerable distance, presenting a very unpleasant appearance; this is particularly the case with respect to the lower lid, the whole external surface of which is sometimes raw and excoriated. This state is called lippitudo, and occurs very frequently in old persons, particularly where the eyes have been exposed to smoke or acrid vapours, and where the individual too often excites the mucous membrane of the alimentary canal by unwholesome food.

It has two stages; the first is a simple excoriation; the second, an ulceration of the border of the palpebræ. In the chronic form of this affection, in strumous subjects, the conjunctiva is greatly thickened, indurated, and altered in its texture; the ciliary glands are destroyed, together with the fine cuticle of the lid, to some extent beyond the ciliary margin; and a partial eversion of the lids, owing to the tumefied state of the conjunctiva, increases the deformity. The mouths of the meibomian glands are obliterated, and the ducts plugged by their inspissated secretion; sometimes the conjunctiva fungates, so as to render the eversion complete, and a process of cicatrization renders it permanent.

In lippitudo, we must first, if there be any appearance of active inflammation, adopt the means most calculated to remove that; then mild stimulating and astringent remedies* applied to the

* The tincture of iodine applied with a camel-hair brush once every day, is an invaluable remedy.—Ed.
surface of the eye-lids, are the most successful. These have the power of bringing the excoriated mucous margin of the eyelids into a better state, and also of exciting a more healthy secretion from the meibomian glands, and will very speedily restore the edges of the palpebrae to their sound and natural condition. The *unguentum hydrargyri nitratis*, or citron ointment, is perhaps the most favourable remedy for this purpose. This may either be employed of its full strength, or diluted with spermaceti cerate. In the surgeon's own hands, it is best to employ it undiluted: the milder form alone should be entrusted to others. In applying this remedy, it is necessary first to soften it before the fire and then to apply it by means of a camel-hair pencil to the diseased surface, care being taken that it does not extend to the mucous surface of the eyelids, so as to reach the eye itself. The *red precipitate* ointment may be employed in a similar manner, but it must be only half the pharmacopoeial strength. Other forms of ointment have been proposed, but they are all inferior to those just mentioned. The lead and zinc ointment, or one combined with opium, will often agree with those slight but very irritable lippitudos sometimes met with; but sometimes even cetaceous ointment is disagreeable and affords no relief: in this case hot water is most agreeable and refreshing to the eye, at a temperature which is not endurable to the hand.

In chronic lippitudo, the ducts, which are distended, should be opened, and the white consolidated secretion should be removed, the conjunctiva should be occasionally scarified, and the meibomian borders stimulated by one of those ointments already mentioned. The tarsal edges should also be frequently bathed with an astringent lotion. In obstinate cases, where the conjunctiva is altered in texture, the sulphate of copper carried over the thickened conjunctiva and ulcerated border of the tarsus is very useful; nitrate of silver, sulphate of copper or zinc, or bichloride of mercury in solution, applied with a camel-hair brush to the tarsal edges, previous to the application of the ointment, are also very useful.
One of the most common affections of the eyelids is that known by the name of *stye*, or *hordeolum*, from its resemblance to a barley-corn. It consists of a small abscess in the lid, and is produced by an obstruction in the follicles of Meibomius; the secretion from the part is altered, becomes inspissated, lodges on the lid, excites irritation, inflammation, and the process of suppuration: lastly, the small abscess breaks, and matter is discharged. In most instances, the suppuration is confined to a small space, but in others it puts on the character of a boil, and sloughing of the cellular membrane then takes place. Some persons are more prone to this disease than others; it frequently appears in those who have been subject to disorder of the digestive organs, or in those of a scrofulous habit of body, and young persons. This morbid affection would be of little consequence in itself, but for the state of the system on which it generally depends. The eyelids adhere to each other in the morning, which distresses the patient considerably. There may be excoriation of the lids—redness and thickening of the conjunctiva—excoriation of the skin of the face; lippitudinous ulcers break out; the cilia become altered in their growth, and turned inwards on the globe of the eye; and from these different states a tendency to chronic ophthalmia is kept up.

Treatment.

It is necessary, when styes are attended with inflammation and redness, that cold applications, poultices, and fomentations should be applied, as in other inflammations; and when matter is formed, that the abscess should be opened with a lancet. But it more frequently happens, that this affection depends upon something wrong in the system, on derangement of the digestive organs, or impaired functions in some part of the body; and then these states must be attended to, for they produce irritation, and sometimes ulceration of the edges of the eyelids. The best local applications that can be made use of, are those of a mild stimulat-
OPHTHALMIC SURGERY.

ing nature *, the mercurial ointments, with a little of which the edges of the lid should be besmeared every night at bed-time, the parts being previously washed with tepid water. The citron ointment (the unguentum hydrargyri nitratis) is the one in common use; but it is, when of the pharmacopoeial strength, too stimulating for the eyes, therefore it must be diluted with some simple ointment. Both the red and white precipitate mercurial ointments are used, and the zinc ointment also; in fact, it is not essential what kind is employed, if it be mildly stimulating.

SECTION V. TINEA CILIARIS.

The tinea ciliaris is a disease of the ciliary foveola, and hence is commonly combined with lippitudo. It occurs along the inflamed, thickened margins of the eyelids, as small ulcers, not unlike the pustules of porrigo, formed round the orifices of the cilia. The porrigo or crustea lactea overspreading the eyelids and cheeks, with chaps and ulcerations behind the ears and within the meatus auditorius, are concomitant affections, especially in children.

This affection, in its active stage, must be combated by suitable antiphlogistic means. When the inflammatory symptoms are gone by, the re-establishment of a healthy conjunctival surface, and a healthy meibomian secretion, is the object to be attempted. Cleanliness is of the first importance, and indeed more depends upon the patient than the surgeon in the cure of these affections. The margins of the lids, and the roots of the ciliae should be thoroughly cleansed from loose scabs and branny incrustations. Then gently touch the surface that is ulcerated with nitrate of silver †. Repeat this application once in two or three days, and in the intervals, smear the edges of the eyelids once or twice a day with the citron ointment, previously softened by heat.

* The solid nitrate of silver applied in an early stage to the centre of the stye frequently effects a cure. — Ed.
† Or the tincture of iodine. — Ed.
Another affection to be described is that known by the name of *trichiasis*. It is that state of the eyelashes, in which they become altered in growth, and turned inwards on the globe of the eye, irritating the conjunctiva on every motion of the eye. Some think that this complaint is not owing to the effect of the altered growth of the cilia only, but to a turning in of the lids, called *entropium*.

**SECTION VII. ENTROPIUM.**

Entropium, or inversion of the eyelids, is produced from ulceration of the tarsi, the cicatrices formed by the healing of lipititudinous ulcers which alter the shape of the lids, so that the eyelashes are turned inwards, irritate the conjunctiva, and produce a continual state of irritation of the whole organ. There is a watering of the eye, together with chronic ophthalmia, and in a short time vessels may be seen shooting over the cornea; nebula and ulceration of the cornea supervene, and thus a serious state of irritation of the transparent part of the eye is produced.

Where the affection is simple trichiasis, the only means that can be relied on, is to pluck away the eyelashes; some benefit may be derived from applying a piece of adhesive plaster to the lid, which is to be fastened to the cheek, so that the eyelashes may be kept bent outwards. The best forceps for removing the eyelashes is one that is rather broad at the points. But when the lid itself is inverted, nothing will avail, except cutting away a piece of skin from the affected lid; when this is done, the edges of the wound are brought together by strips of adhesive plaster; a cicatrix is formed, and the eyelids are then drawn upwards. The mode of performing the operation is very simple; lift a portion of the skin of the affected lid with a pair of forceps which have transverse branches at the point, and these grooved transversely; with this lay a firm hold of the portion of the lid, take a pair of curved scissors, and cut off the projecting portion, as near to the edge of the lid as you can.
SECTION VIII. ECTROPIUM.

Ectropium, or evasion of the lids, happens from ulceration on their edges, an altered and vitiated secretion from the follicles of Meibomius, which produces a redness and an altered state of the conjunctiva, and from cicatrices and contractions of the skin of the lids, which tend to evert them. This complaint is very distressing to the patient; the eye has not its natural covering; irritation, from extraneous bodies getting into it, is produced, and thus a constant state of chronic ophthalmia is kept up.

When the disease is brought on by a thickened state of the conjunctiva lining the lid, that portion must be removed; if from a cicatrix, it must be divided; but this seldom answers; the divided cicatrix again contracts, and the disease returns. The plan usually adopted consists in removing a triangular portion of the lid, just in the same way as the operation for cancer of the lip is performed; by cutting through a piece of lid which is raised by a pair of forceps, so that the base shall be towards the edge of the lid, and the apex below, at the union of the two sides. A suture is applied through the incision, the edges of the wound are brought together; these united, tend to keep the lid in the natural position; and, in fact, the operation in this way is often successful.

SECTION IX. PALPEBRAL TUMOURS.

Various small tumours are often to be met with on the lids, such as encysted tumours and others. But as these require no particular plan of treatment different from those in other parts of the body, little need be said about them. In their removal, one thing must be borne in mind, viz., the importance of the organ in the neighbourhood of which they are situated, so that in removing them, no injury is done to so delicate a structure.
SECTION X. ENCHANTHIS.

This consists in an alteration of the structure of the caruncula lachrymalis, and neighbouring semilunar fold of the conjunctiva. The caruncula is enlarged; at the commencement it has a granulated appearance, which it loses as it increases, and then becomes similar to a hazel nut, being ash-coloured, and streaked with varicose vessels. This enlargement or excrescence prevents the lids from closing, and allows extraneous matter to enter, which keeps up inflammation of the eye, and it also presses on the puncta lachrymalia, and turns them out of their place; the tears, thus prevented from getting into the lachrymal sac, are effused on the cheek.

The best treatment is to remove it altogether. It is a simple operation, and is thus performed: an assistant, raising the lid by taking up the tumour with a pair of forceps, removes it with a pair of curved scissors with convex edges. When this complaint has not assumed a malignant form, it is always remediable by excision. Never operate, however, when the enchanthis has become of the malignant kind, and put on the cancerous appearance. This will be known by the dull red colour of the excrescence, its excessive hardness, lancinating pains extending to the eyeball and forehead, particularly when touched; foul ulcers, with irregular edges, having all the appearance of cancer in any other part of the body.

SECTION XI. PTOSIS.

A permanent drooping of the upper eyelid without any inversion of the cilia, or inflammation, occasionally takes place. It is, for the most part, a symptomatic disease, frequently accompanied by some form of paralysis, or consequent on apoplexy. It may either be congenital, or dependent on atony of the lid generally, or on paralysis. The treatment will vary with the cause: if it be congenital, or dependent on atony, the removal of a portion of
the integument by the knife will most probably remove the deformity; but if it depend on paralysis, its removal will then depend on general treatment, which has for its object the relief of the sensorium.

SECTION XII. WOUNDS OF THE EYELIDS.

Wounds of the eyelids are neither dangerous nor difficult of cure; they merely require to be treated by those simple rules which regulate the practice of surgery in other parts. Penetrating wounds of the eyelids, whether horizontal or perpendicular, will, generally, require the insertion of one or more sutures to retain the edges exactly in apposition, assisted by strips of adhesive plaster, a compress, and the due application of a bandage to ensure the perfect immobility of the part. When the lachrymal canal is divided, it is doubtful if union ever takes place in such a manner as to render it pervious. Wounds of the eyelids are very seldom productive of defective vision, or amaurosis, unless some injury has, at the same time, been done to the eye itself.

SECTION XIII. FISTULA LACHRYMALIS.

By this term is understood, all obstructions of the lachrymal passage preventing the natural flow of the tears and mucus from the eyes to the nose. The most common cause of this complaint is the closure of one of the puncta, and then there is epiphora, or a watering of the eye, together with suffusion of the tears, which leads the surgeon to the discovery of the cause. This must be punctured by a small sharp pin, made of gold or silver, which is to be pushed through it to the lachrymal sac; the obstruction is removed and the epiphora relieved.

When the epiphora continues, the eye becomes irritable, a drooping of the lids comes on, and an altered state of the lachrymal sac is produced. The most important source of this complaint is obstruction of the ductus ad nasum. The original seat,
then, is in the duct leading from the lachrymal sac to the nose, and the tears, instead of finding their way to the nose, flow down the cheek; this symptom may, however, arise from a polypus in the nose, and then it will be relieved by the removal of the polypus. One of the symptoms of malignant fungus of the nose, is suffusion of tears from pressure in the nasal canal; this disease terminates fatally, and if removed it returns; in this complaint, the flow of tears is a very unimportant symptom, compared with the original disease which gives rise to it.

But sometimes there is inflammation of the bones of the nose, or periosteum covering them, and the membrane lining the duct, which is thickened, and then the duct becomes more or less obstructed. It not unfrequently takes place in persons of a scrofulous habit, and those who are subject to affections of the covering of the bones. It is also sometimes a consequence of the abuse of mercury.

Fistula lachrymalis may be divided into three stages:—1st. Where there is only simple distension of the lachrymal sac. 2dly. Where there are inflammation and suppuration of the sac. And the third stage is that in which there is a fistulous opening leading from the sac to the cheek.

The first symptom which leads the patient, in this stage, to observe any thing amiss with the eye, is, that on reading or exposing it to the wind, there is a watering of the eye; in a short time, this becomes constant, and then a swelling appears at the inner corner of the eye, arising from distension of the lachrymal sac, the tears collecting in it. These produce irritation; mucus and purulent matter is secreted; but when the sac protrudes, pressure made on it, pushes the tears or mucus either through the puncta, over the face, or down the nose. The complaint sometimes remains in this stage for many years (pressure being occasionally made on the sac to empty it) with only little inconvenience. From the pressure of the distended sac, and obstruction of the nasal duct continuing, or some accidental cause, irritation is excited, and the second stage produced.
This affection is attended by a puffiness of the inner corner of the eye, and redness of the surrounding skin, which becomes swollen and hard, from the effusion of lymph. Suppuration having commenced in the sac, ulceration comes on, and the matter effects an external opening, by which it is discharged. Now obstruction, inflammation, and suppuration do not always take place in the course of the ductus ad nasum from ordinary causes; but the progress of the complaint, when arising from ordinary and from specific causes, will be different. An opening being thus made in the sac, it is rendered permanent, or kept open, by the flow of pus and tears out of the wound, over the cheek; the disease then arrives at the third stage.

In this stage of the complaint, the patient is distressed a good deal by frequent returns of inflammation and suppuration of the sac.

Although various means have been attempted in the cure of this complaint, no plan has been yet laid down that has proved successful; or at least the benefit to be derived from the means and treatment recommended is in most cases very slight. In many cases little need be done but to evacuate the sac, for the purpose of preventing irritation in those cases where there is simple distension of the sac. One cause of this complaint is a vitiated state of the follicles of Meibomius: when matter is secreted, and the eyelids are closed together, and irritation is thus produced in the lachrymal sac—in these cases, the lids should be washed with tepid water, and besmeared every night at bed-time with a little of the unguentum hydrargyri nitratis. By this means, and attending to the constitution, and removing irritation as it arises, the patient may remain in that state for years.

When the obstruction is complete, the distension considerable, the attacks of inflammation frequent, and suppuration has commenced, another kind of treatment must be adopted: in this stage the object of your treatment will be to effect a natural passage for the flow of the tears, that is, through the nasal duct, instead of their flowing over the face. Anel was the first who attempted
to procure a passage for the matter and tears into the sac, when
the natural one was obstructed; and this he did by introducing a
very fine probe through one of the puncta and the lachrymal sac
to the ductus ad nasum, and thus dilated the stricture: but the in-
strument was so flexible and thin, that it was ill calculated to over-
come the obstruction. Mr. Travers, who has had most extensive op-
portunities of watching the progress and trying the effect of dif-
ferent treatments in this disease, recommends the use of an instru-
ment of this kind; it is, however, somewhat different; it is more
nail-headed, and not of the same exceeding fineness, being more ef-
fectual for removing the obstruction.

Mr. Wathen recommended that a hollow metallic tube should
be introduced into the ductus ad nasum; the object of its being
hollow was to allow the passage of tears through it, but it was
found inadequate; it soon became filled with mucus. M. Du-
puytren was in the habit of using a gold tube in this way, and it
is said that most of his cases were cured; this, however, is doubt-
ful. Mr. Pott also advised the use of bougies for removing the
obstruction. The plan laid down by Mr. Ware is the one now
generally adopted; it consists of introducing a nail-headed style
into the ductus ad nasum, and letting it remain there. The style
should be just large enough to allow of the flow of tears by the
side of it. If no opening has been made from the repeated in-
flammation, the mode to be adopted in making one is as follows:

direct the patient to be seated, and then standing behind him,
pass your hand round the patient's head, open the lachrymal sac,
and then carry a blunt-pointed bistoury inwards and downwards,
and divide the obstruction; the instrument fitted for making
the external opening is a phymosis knife. Having done this, as-
certain whether the passage is free, and then introduce a nail-headed style, about an inch and three-eighths long: the head of the style is to lie obliquely on the front of the cheek, and a piece of adhesive plaster spread on black silk to be put over it, which will prevent persons from suspecting that there is any thing wrong with the eye. The style requires to be removed once a day for the first week, and to be washed. Sometimes there is a little irritation produced by its introduction, but in general there is none, and the comfort the patient experiences is very great; the water ceases to flow over the cheek—the sight becomes stronger—the tendency to inflammation is obviated; and, indeed, so much comfort is experienced, that the patient is loth to dispense with the use of the style.

Although the relief obtained from this plan is great, yet no plan of treatment has been decided on which generally proves successful; for this mode must be considered more in the light of a palliative than a curative remedy; the obstruction frequently returning when the style is removed. It sometimes happens that, from disease about the bones of the nose, a fistulous opening from the sac to the nose is formed. If an operation should be determined on in such a case, a sharp-pointed instrument must be introduced, either a probe or trocar, through the fore part of the os unguis into the nose, and the only point which remains is to keep open the perforation by a sponge tent, or nail-headed style; but it becomes rarely necessary to perform this operation.

CHAPTER II.

DISEASES OF THE ORBITAR APPENDAGES.

SECTION I. ABSCESS.

Abscess sometimes forms within the orbit, and previous to its discharge occasions an equal protrusion of the globe, with eversion
of the eyelid, dilated pupil, and suspended vision. Its situation and effect upon the eye give much pain and apprehension to the patient, as well as considerable disturbance to the system at large. The sight is sometimes permanently extinguished. In other cases, it returns after the discharge of the abscess, and consequent removal of pressure. If the formation of matter cannot be prevented, the free discharge of it should be assisted by keeping the external orifice freely open, until the sac has gradually contracted and closed. If the abscess should have formed in the cellular texture and parts surrounding and supporting the eyeball, the cure will be effected without any deformity; but if it should be connected with the periosteum lining the orbit, it will frequently be found to give rise to very troublesome consequences, and often to deformity, by causing an eversion of the lid affected by the disease.

SECTION II. FATTY AND ENCYSTED TUMOURS.

Tumours of various kinds occasionally form in the orbit. Some are compact, and consist of fatty matter; others contain a mixture of liquid and cretaceous matter, or a limpid and sanious fluid. When they project above, below, or to one side of the eye, they may be removed by dividing the conjunctiva immediately over the tumour, then seizing the tumour with a double hook, dissect it out.

When the tumour is hard, or of an anomalous character, it generally arises deeper in the orbit, and, in advancing to the surface, displaces the eye so as to cause considerable deformity, and frequently to destroy vision. When the tumour is posterior to the eyeball, or connected with it, it can scarcely ever be removed, unless the eye be extirpated at the same time,—generally the most advisable step, as the eye will, in most cases, be either useless or disorganized. Tumours sometimes form beneath the periosteum of the orbit, giving to the touch a firm resistance: such cases are always unfavourable, seldom curable.

Polypi of the frontal, sphenoid, and ethmoid sinuses, in their
progress burst through the ethmoid and lachrymal bones, and sometimes extrude the eyes, so as to occasion the most horrible deformity: in such cases, an operation offers the only, though doubtful, remedy. Exostoses of the orbit rarely occur.

**SECTION III. ANEURISM IN THE ORBIT.**

The looseness of the connecting texture in the orbit, and the number and tortuosity of the vessels, seem to predispose to that disease of the arterial and venal extremities, which gives origin to peculiar vasculo-cellular tumours, the precise nature of which is not yet satisfactorily ascertained; combining, as they do, the structure of nævus, with the more formidable character of aneurism. Two cases of this disease are recorded, in both of which the carotid artery was tied with complete success.

**SECTION IV. EXOPHTHALMOS.**

A protrusion of the eyeball not only accompanies tumours, when of a large size, but takes place from other causes. The simplest form is when the protrusion takes place in consequence of inflammation, which on subsiding has left an induration of the cellular texture behind or around the eye, causing it to project: in such cases, it may generally be removed by alteratives, by the establishment of a drain in the neighbourhood, by attention to the state of the bowels, and by good air and exercise. If the swelling should degenerate into a scirrhous tumour, extirpation of the whole contents of the orbit offers the only, although doubtful, chance of recovery. Schmidt relates the history of two cases of exophthalmos from an hydatid of the lachrymal gland.

**SECTION V. DISEASE OF THE LACHRYMAL GLAND.**

The lachrymal gland is subject to simple or interstitial enlargement, to suppuration, and to scirrhus, like other glands of similar structure. Its enlargement is known by the lobulated appearance of the tumour, on further stretching the skin of the projected lid.
It often suppurates in children, and occasions an excessive swelling above the upper eyelid, depressing the tarsus upon the globe so as completely to conceal it. The abscess may be conveniently opened and discharged beneath the lid, with a narrow curved bistoury. Mr. Travers removed this gland, in a state of true scirrhus, from the orbit of a middle-aged man, with success. There was no other deformity than a slight drooping of the lid at the outer angle.

CHAPTER III.

INFLAMMATION OF THE CONJUNCTIVA.

SECTION I. SIMPLE INFLAMMATION OF THE CONJUNCTIVA.

This may be divided, like other inflammations, into acute and chronic. The symptoms of inflammation of the conjunctiva do not differ from those of inflammation of other parts of the body, except in so far as they are modified by the structure of the part, and by the function of the organ. Indeed the change which takes place in inflammation of the conjunctiva may be regarded as a very beautiful instance and illustration of the change which takes place by the process of inflammation in general.

Inflammation of this organ may exist in various degrees, from the slightest degree of excitement up to inflammation of the most violent and intense character.

The first symptom is redness of the part: which is very remarkable, because the blood naturally conveyed by the vessels to this part is colourless. Under any existing irritation, the vessels are distinctly observable, and become injected by red blood. When the irritation continues, the vessels become still more apparent, and at length all the interlacements and anastomoses of the vessels of the conjunctiva partake of the inflammation, and present almost one uniform appearance of redness. During this time more or
less pain is experienced; at first, as the vessels become filled, an uneasy sensation is felt; this increases, and at length, upon the admission of light, a sharp lancinating pain is experienced; the patient is under the necessity of keeping the eye closed, and indeed has some difficulty in raising it, not only from the pain he suffers, but from the degree of fulness and swelling with which it is accompanied. This pain goes on increasing, and at length the patient complains of a burning heat, and a sensation as if some extraneous body were lodged in the conjunctiva: a sort of grating between the conjunctiva and the lid. At this time the admission of the least light or air produces such lancinating pain, that the eye is spasmodically closed. During the first part of the inflammation there is a more abundant secretion of tears, and this generally increases, until there is a constant flow of water from under the lids.

It sometimes happens that, at the highest stage of excitement, this increased secretion is suddenly diminished, and there is a preternatural dryness of the eyes, producing painful sensations. A considerable degree of swelling takes place; the conjunctiva becomes turgid from the increased quantity of blood admitted by the vessels, and effusion follows. Although the swelling is pretty equally diffused over the whole surface of the conjunctiva, it seems to be the greatest at the transparent cornea, because here the membrane is more firmly adherent. The conjunctiva is here elevated in a circular fold, and this appearance is called chemosis. The eyelids are in general more or less swollen from the same cause; namely, the greater determination of blood to the part, and the filling of the vessels. Not only is pain experienced in the eye, but also a sense of weight and fulness in the globe of the eye, as if the ball were too large for the socket. The neighbouring parts, also, the forehead and temples, partake of the pain; there will be a shooting pain in the maxillary bone, or more deeply seated in the head; these pains are in some instances extremely violent. This train of symptoms is attended with a greater or less degree of constitutional irritation. The patient complains of
great lassitude, prostration of strength, chilliness, or rigor followed by heats. His skin will often be hot and dry, and his pulse quick and hard; his stomach will be affected, and nausea or vomiting produced; he will often complain of pain in the back, and in short of all the symptoms which indicate a considerable fever of the sympathetic kind, arising from local irritation.

The degree in which these symptoms occur will of course vary according to the constitution of the patient. In young and robust persons there will often be a high degree of local inflammation, without much constitutional irritation; while, on the other hand, in delicate and irritable patients, a much less, nay sometimes a very trifling degree of local inflammation will be accompanied with violent symptoms of constitutional derangement. Accordingly, although, *caeteris paribus*, the degree of constitutional irritation will be proportional to the degree of local excitement, this principle will be so much modified by the particular constitution of the patient, that in cases where, from the violence of the inflammation, much constitutional derangement might be expected, very little will occur; and *vice versa*, where, from the slight degree of local excitement, very little might be expected, it will sometimes happen that a great degree of constitutional irritation will attend it.

So much for the symptoms of ophthalmia, as existing in simple inflammation of the conjunctiva, without any particular modification. It will not be necessary to point out particularly the predisposing causes of this complaint, because they do not differ from the predisposing causes of inflammation in any other part of the body. It is only necessary, therefore, to point out some of the causes which most frequently produce irritation in the eye, and lead to inflammation of the conjunctiva. Any extraneous body lodging in the conjunctiva will produce this effect; and this is so frequently the cause of inflammation, that it will be right in all cases carefully to examine its surface in order to ascertain whether there is any extraneous body in it, such as a particle of dust or sand, a piece of grit or lime, or any of the scoriae which often fly off from iron while it is beaten on the anvil. Any extraneous
body of this kind will readily produce irritation, and inflammation of the conjunctiva.

Variation of temperature, especially when accompanied with any sudden access of light, will produce this inflammation. Thus it has often happened that persons who have gone out of a warm room to look at fire-works have been attacked with it. The change of temperature, together with the brilliant light to which the eye is exposed, seem to produce it. Persons sitting in a hot room, or a theatre where there is much light, and exposed at the same time to a draught of cold air, have often had inflammation of the conjunctiva. So, particular states of the atmosphere will become in some degree excitants of this inflammation, and it has been observed to be more frequent during the prevalence of easterly winds. There seems to be some ground for this opinion. Other causes of this inflammation may exist, but it is not necessary to enumerate them more at large. The principal causes are, the admission of any extraneous body and variations of temperature, especially if accompanied by intense heat and light, or partial exposure to draughts of cold air.

The term chronic is not, as its etymology would indicate, applied merely with reference to duration of time; it is not only applied to signify that state of congestion and debility of vascular action produced by the acute stage, but it is also applied to that state of inflammation which from the commencement has a character of atony and debility. As this is the more frequent form in which this inflammation occurs, whether primary or following the acute stage, it is necessary to attend particularly to the symptoms by which it is distinguished, as the mode of treatment is very different from that which is required in acute inflammation.

The symptoms of chronic differ from those of acute inflammation of the conjunctiva rather in degree than in kind; so that after they have existed for some time in the acute stage, the disease gradually passes into the chronic stage. The redness will be less intense, the pain which accompanied it less acute, the intolerance of light will be less, the chemosis and swelling will be diminished,
the effusion of tears less considerable, the constitutional irritation will in a great degree have subsided, and, in short, all the acute symptoms will be much mitigated. There will still, however, remain a considerable degree of irritability in the eye on exposure to light; some artificial defence to exclude the light will be necessary, and the person will still be incapable of applying the organ to the ordinary purposes of vision.

The causes of chronic inflammation, both exciting and predisposing, are very similar to those of acute inflammation, and indeed one form very commonly passes into the other; but, at the same time, it is to be remembered that there are many causes which tend to produce this inflammation, accompanied with atony and debility in the very outset, which distinguish it from acute ophthalmia. Chronic inflammation of the conjunctiva is very apt to take place, where the patient has for a long time been labouring under disorder of the digestive organs. Patients who have this form of the inflammation often complain of dyspeptic symptoms; such as uneasiness about the scrobiculus cordis; distension of the stomach after eating, flatulence, disagreeable tastes in the mouth, bitter, sour, or putrid; furred tongue, and other symptoms indicating derangement of the digestive organs. Inflammation of this kind is very apt to arise from, or to be kept up by, exposure to acrid fumes or smoke in particular trades. It is not unfrequently the concomitant of dentition, the measles, or small-pox; it sometimes accompanies rheumatism and gout. Frequent intoxication and various other causes may predispose to it, which it will be necessary to investigate carefully, because the mode of treatment will materially depend upon them.

In general, inflammation of the conjunctiva is a very manageable complaint. It passes into chronic inflammation after the acute stage has continued for a certain time, and it not unfrequently subsides of itself. A spontaneous cure, however, is by no means to be depended upon, and we ought on no account to neglect or relax in the proper mode of treatment, from any reliance upon such a cure; because simple inflammation of this mem-
brane may lead to inflammation of the deeper seated tunics of the globe of the eye; suppuration may be induced, the organ may at length become permanently disorganized, and the sight of the eye irrevocably lost. The consequences of inflammation of this membrane are very similar to those of inflammation in other parts of the body. It sometimes terminates in effusion, the serum or blood under the conjunctiva rising in a roll above the transparent cornea. It sometimes produces the adhesive process; and when it terminates in this manner, the adhesive matter is deposited under the conjunctiva which covers the transparent cornea, and is recognised by a hazy appearance at the part. The adhesion is various, both in its extent and quantity; it is sometimes so slight as only to produce a simple clouded appearance over a certain part of the cornea, which is technically called nebula; it is at other times more considerable in quantity, and produces an appearance of considerable opacity in the cornea, which is usually called albugo, or leucoma. The deposit of matter is sometimes confined to a simple speck, and is sometimes spread more or less over the whole surface of the cornea, so as to interrupt or intercept vision altogether.

The inflammation sometimes proceeds to the suppurative process; indeed, the tunica conjunctiva appears to be of a nature very analogous to the mucous membranes of the body, and like these, is exceedingly prone to the suppurative stage of inflammation. The suppuration generally proceeds from the surface of the conjunctiva, as from the surface of any mucous membrane in a state of inflammation. In other instances, the formation of pus is circumscribed; a deposit of lymph takes place where the conjunctiva covers the cornea, or in its immediate vicinity, and a little abscess or pustule arises from the centre. Ulceration is also sometimes produced: this usually occurs in the cornea, in consequence of laying open this pustule, probably from the denudation or exposure of the cornea. Lastly, sloughing and mortification of the cornea is not an uncommon effect of a high degree of suppurative inflammation. The same consequences, therefore, occa-
tionally arise from inflammation of the conjunctiva as from inflammation in other parts of the body; namely, effusion, adhesion, suppuration, ulceration, and mortification.

It will be necessary to adopt at once, with vigour, the anti-phlogistic plan of treatment. As the best mode of diminishing the action of the heart and arteries, the use of the lancet should be freely resorted to, in the commencement of inflammation of the conjunctiva. It will not do only to take away a certain quantity of blood; as, for instance, eight, ten, or sixteen ounces; but in this, as in all other cases of acute inflammation, accompanied with hardness of the pulse, it is necessary to make a free orifice in a large vein, and take away a quantity of blood, until some manifest effect is produced upon the action of the heart and arteries; ascertain how the heart is affected, and carry on the bleeding even to faintness. This may prevent the necessity of again having recourse to the lancet; or if it should be necessary to do so, blood may be taken away in much smaller quantities. The patient's pulse is the only certain criterion; and when this is diminished, leeches may be afterwards conveniently applied.

The application of leeches, in the first instance, except in large numbers, is seldom sufficient in acute inflammation; three or four leeches will scarcely produce any effect upon it. Opening the temporal artery is another mode of bleeding, which is attended with very good effects in this inflammation. This practice has been decried by some persons, who suppose that by opening the temporal artery you force the blood to pass through the anastomosing branches, and in this way throw more blood into those vessels which are immediately distributed to the eye. Whether this be the case is not quite clear, but certainly good effects have been observed from opening the temporal artery in this inflammation, and therefore it may sometimes be proper to adopt this practice. Some practitioners recommend the practice of dividing the vessels of the part by scarifying the conjunctiva. This is a practice, however, which is not to be recommended; the quantity of blood taken in this way is small; the irritation pro-
duced in performing the operation is considerable, and the clots of blood left after it often excite or keep up inflammation of the conjunctiva.

Great benefit is derived from treatment directed more especially to the body at large; such, for instance, as diaphoretic medicines. The tartrate of antimony is a very useful medicine of this kind; perhaps there is no medicine which, after blood-letting, tends so effectually to keep down the action of the heart and arteries. It should be given in such doses, and repeated at such intervals, as to keep up a state of nausea. Purgative medicines are thought by some persons to be not at all necessary in this inflammation. Richter, a very valuable writer on surgery, is of this opinion; which is rather extraordinary, for much benefit will undoubtedly arise from evacuating the bowels of any accumulation of feculent matter. Constitutional irritation will be materially abated by keeping up the secretions from the intestines, and, in many cases, by altering and rendering them more healthy. The bowels should therefore be freely acted upon by doses of calomel, combined with jalap, scammony, or cathartic extract; and the effects of these medicines should be kept up by the exhibition of neutral salts, so as to produce a considerable number of watery stools. At the same time, the diet of the patient should be low, and he should be kept in a state of perfect rest and quietude.

When an impression has been made in this way on the symptoms, it will then be proper to adopt other plans of treatment; for instance, when blood has been taken to a considerable extent, the application of a blister to the nape of the neck will be attended with beneficial effects. The treatment of the part is also to be considered; the head should be kept raised, so as to favour the return of the blood from the eyes, and the access of air or light should also be prevented by keeping the room darkened. It is not to be inferred from this, that the room should not be kept well ventilated, for this is a very material point, but only that the patient should not be exposed to variations of temperature.
With respect to local applications, it will in general be found that moist warmth is most agreeable to the patient in acute inflammation of the conjunctiva. This may be applied in the way of fomentations, either by means of tepid water, or decoctions of marsh-mallows, poppy-heads, or camomile flowers. Where there is much irritability, steam will often be found useful, and especially the steam of water in which opium has been infused, from which the patient will experience great relief.

Some persons recommend a sort of poultice, although, from the tumefaction of the lids, this is an application which cannot be very conveniently used. The poultice, of course, is not of the ordinary description; it is generally made of camomile flowers, boiled so as to be rendered extremely soft, and put into a gauze or muslin bag, which should be applied so as to make a very slight degree of pressure on the eye. If poultices are employed, they should be very frequently changed, for otherwise they are very apt to confine the secretions, and rather to keep up than diminish irritation. Fomentations, however, are greatly preferable.

Many persons prefer cold to warm applications; if cold applications are employed, care must be taken that they do not stimulate the part. The choice of cold or warm applications should depend entirely on the feelings of the patient; if he do not find relief from warm, you should then try the effect of cold applications. In general, moist warmth has, however, a tendency to produce relaxation of the vessels, and to favour the passing of the acute into the chronic stage of inflammation.

Warm applications must not be continued when the chronic stage has commenced, for they would then do mischief instead of good. On this account, it is necessary to observe attentively the change of the inflammation from the acute to the chronic stage, that the plan of treatment may be altered as soon as the latter stage has commenced.

In the chronic stage the evacuating plan may, to a considerable extent, be laid aside; the diet, though still not stimulating, may
be more generous; there will be no necessity for continuing diaphoretic medicines, as the skin will generally be sufficiently moist, nor will it be necessary to evacuate the bowels so freely, though attention should be paid to their due action; alterative medicines will often be found beneficial. The local applications should be of an entirely different character; they ought to be moderately astringent and stimulating, as your object now is to excite some degree of action in the vessels, and to get rid of their relaxation and atony, care being taken at the same time not to stimulate the parts too much.

Various collyria or eye-waters are used for this purpose; all of them moderately astringent or stimulating; such as the solution of alum in water, solutions of the sulphate of zinc, or the sulphate of copper, or the liquor plumbi subacetatis. These solutions should at first be very much diluted; ten drops of the liquor plumbi subacetatis may be added to four or six ounces of water; a grain of alum, or half a grain of the sulphate of zinc or copper, may be dissolved in an ounce of water. The solution should be gradually strengthened, in proportion to its action on the part, and the degree of stimulus which may be required. To judge how far the stimulus may be carried, the criterion is exceedingly simple; if a certain degree of smarting and pain is produced, which soon subsides, and leaves the patient much more easy than before, the collyrium is beneficial; if, on the other hand, the patient experiences a great degree of pain, which does not subside speedily, and the vessels become turgid, the collyrium is doing harm, and the quantity of stimulus ought to be diminished.

The best mode of applying an eye-wash of this kind is to inject it by means of a silver or ivory syringe, introduced under the lids every two or three hours. In this way, the solution is more surely diffused over the whole surface of the conjunctiva. An eye-cup will answer the purpose very well, if the patient, after immersing his eye in the cup, has the courage to open it.
The syringe, however, is a more manageable instrument. Mr. Ware recommended, in chronic ophthalmia, what in the old pharmacopoeias used to be called tinctura thebaica. The vinum opii will answer the same purpose, and seems to be one of the best stimuli which can be employed in chronic ophthalmia; it acts as a mild astringent, and at the same time, by its soothing quality, sheathes the effect of the stimulus, so that no pain is produced. Patients are able to bear them stronger when the chill is taken off from them; the warmth of the application seems to take away the pain, while the effect remains the same. The vinum opii may be employed in the quantity of one drop, or even of two or three drops, two, three, or four times a day. It will be best to drop it into the inner canthus of the eye, with a camel-hair pencil; the patient should then shut his eye, and move it about, so that the fluid may be diffused over the whole surface. Mr. Green has seen this application used two or three times a day, and in the case of children, sometimes only once a day, with the most decided benefit. There is another circumstance which should be attended to in the treatment of chronic ophthalmia, namely, not to exclude the light so much as in acute ophthalmia. If the patient can bear a moderate degree of light, it should be freely admitted. He should wear no bandages, and have no other protection than a shade. Continued darkness and heat are very apt to keep up a morbid state of sensibility and irritability in the eyes. Lastly, with respect to the treatment of chronic ophthalmia, the various causes which predispose to, in some instances excite, and in many keep up, this state of the complaint. Conjointly, therefore, with those remedies which have just been pointed out, others must be given to act on the morbid state of the constitution which keeps up the local irritation, and success in the treatment of this inflammation will very materially depend on the accuracy with which the causes have been investigated, and the judgment with which the remedies are applied.
SECTION II. PURULENT OPHTHALMIA.

Suppurative inflammation of the conjunctiva is the most severe form of inflammation in that membrane. It is exceedingly acute, very rapid in its progress, and often very destructive in its ultimate effects. This form of the complaint requires very active treatment. The symptoms are so manifest, that there can be no doubt of the nature of the complaint, its prominent character being the formation of a considerable quantity of purulent matter. In other respects, the symptoms are not very different from those which characterize inflammation generally. The patient at first feels an uneasy sensation about the eyes; next some degree of pain on the admission of light, which increases to a considerable intolerance of light. Redness of the vessels is observed, and besides this, a greater degree of swelling than commonly attends simple inflammation. The eyelids soon become much swollen, the conjunctiva, where it covers the fore part of the globe of the eye, is tumid; there is considerable chemosis, and often such turgescence of the upper lid as to prevent the patient from raising it. The lids are often so much tumefied as to become everted, so that a sort of roll of the lid is formed. These are the symptoms which precede the discharge of matter.

A fluid first appears which is not opaque, and has the character of tenacious mucus; in the course of twenty-four hours it assumes the appearance of pus. It is thick, yellow, sometimes green, and poured out in considerable quantity. The appearance of the tunica conjunctiva has been not inaptly compared to the foetal stomach, when injected. It has the appearance of a villous membrane highly injected with red blood, and certainly very nearly resembles the internal surface of the foetal stomach when highly injected. If examined with a glass, drops of pus may be observed oozing on the surface, and collecting there in considerable quantities.

The acute stage of purulent ophthalmia is of very short dura-
tion; it has a tendency to pass rapidly into the atonic stage, in which there is action without power, and congestion of the vessels of the part. At this time the violence of the acute symptoms is mitigated, but the patient labours under considerable prostration of strength.

Purulent ophthalmia has a great tendency also to terminate in sloughing. The cause of this tendency it is perhaps not very easy completely to explain; Mr. Travers thinks that it is produced by a constriction of the small vessels distributed to the part of the cornea, in the same way as sloughing of the glands is produced in paraphymosis by the cutting off of such vessels. Sometimes the sloughing commences in a small portion, and gradually lamella after lamella is destroyed, until the aperture assumes a funnel-like shape; at other times a slough forms in a considerable portion of the cornea at once, and opens into the anterior chamber. The commencement of the sloughing process may be recognised by a haziness of the cornea, which soon amounts to a considerable opacity. When a dark appearance is observed beyond the ulcerating parts running from the deposit of lymph, so as to form a surface from which the chasm is to be filled up, this may be regarded as a favourable sign that the sloughing has here found its limit. The case is not to be regarded as hopeless, when sloughing of the cornea has commenced, for if the opening be only small, the common effect is that the aqueous humour will escape; the iris will become prolapsed into the aperture of the cornea, but the patient may afterwards recover, and though the shape of the pupil will be altered, he may still retain a considerable degree of vision. When the opening is large, the iris will not only be prolapsed, but protruded; not only the aqueous, but the crystalline and the vitreous humours will escape, and the sight of the patient will be irretrievably lost.

The causes of purulent ophthalmia are various; it is often occasioned by the violent degree of inflammation produced by some highly irritating substance, such as caustic lime. It occurs oc-
of new-born children; in this case it is doubtful whether it arises from the first exposure of the eye to the light, or, as is commonly supposed, from the application of the vaginal secretions to the eyes of the child on its passage into the world. It generally takes place in the first week or month after the birth of the child, and seldom later than three months.

One of the most violent forms of purulent ophthalmia, is that which is called gonorrhœal, from its being produced by the application of gonorrhœal matter to the conjunctiva. This of all others produces the most intense degree of inflammation. It may be readily traced to the cause just stated, in consequence of the person labouring under gonorrhœa, inadvertently using a towel, or any thing to which the gonorrhœal matter has been applied, and thus conveying it to the part. This inflammation has been stated, upon what may be considered good authority, to be a metastasis of the gonorrhœal symptoms from the urethra to the conjunctiva. Mr. Green has never, however, seen a case in which he could entertain the least suspicion that the complaint was produced in that way, and he does not think that there is sufficient evidence to establish such an opinion.

There is another form of ophthalmia, which has been called the epidemic, or Egyptian; epidemic, in consequence of its attacking a number of persons at the same time in particular districts; and Egyptian, because it resembles that form of ophthalmia with which our troops were attacked in Egypt in the year 1801. This disease was, however, well known in this and other countries long before our soldiers went to Egypt; and it has taken place in districts where there could be no possibility of communication with those soldiers. There can be no doubt that it arises spontaneously, and often attacks epidemically a number of persons in the same district. How it arises it is difficult to say; it was supposed to be produced in Egypt by the combined effects of heat and dust; but it is doubtful whether it may not rather arise from some particular state of the atmosphere with which we are not perfectly acquainted.
If the lancet is to be used in any kind of ophthalmia, it is more especially to be used, not only boldly, but very early in this. It may be said, indeed, that unless some decided impression is made on the symptoms in the first twenty-four hours, we shall be unable afterwards to check the progress of the disease. It will be necessary, therefore, to push blood-letting to a very considerable extent, in an early stage of this inflammation. Topical bleeding, by the application of leeches, is quite out of the question in this complaint, except in the case of children. Blood should be taken in large quantities from the arm of the patient. The army surgeons, who have had the most extensive opportunities of witnessing this form of the disease, all concur in the utility of copious bleeding.

All the antiphlogistic remedies which have been before enumerated, are to be put in practice in this case. Purgatives should be administered so as to produce a considerable quantity of watery stools; diaphoretic medicines, and especially the tartrate of antimony, in doses of a quarter or half a grain, should be given at such intervals as to keep the patient in a state of nausea, and topical applications should be employed very much in the same manner as in simple inflammation. During the first stage of the complaint, moist warmth in the form of fomentations and poultices will be found beneficial. The acute stage, however, is of very short duration, and they are not to be continued beyond that period.

The extent to which the antiphlogistic plan should be pushed must vary, according to the violence of the complaint and the constitution of the patient. Young, robust, and plethoric patients will bear depletion to almost any extent; on the other hand, more caution must be exercised where the patient is of a weakly, debilitated, or irritable habit of body. Nothing must, however, deter from the adoption of an active plan of treatment, until a manifest effect has been produced on the system of the patient; until the pulse becomes soft; the skin moist; the pain, swelling, tension, and throbbing of the eyes considerably abated;
the chemosis diminished, and in fact all the acute symptoms more or less subdued. When this is the case, if attended to in an early stage, the subsequent treatment will in general be very easy.

It often happens, however, that the surgeon is not called to this complaint until it has arrived at the chronic stage, when the conjunctiva is feebly pouring out pus, the pulse depressed, the skin cold and clammy, the countenance sallow, and when the constitution has materially suffered from the progress of the disease. In this state, an entirely different plan of treatment will be required. Gently stimulating applications should be employed by means of a syringe, so as to cleanse the conjunctiva, and free it from the pus which has collected on its surface, and at the same time stimulate the relaxed vessels. In general it will be necessary to employ tonic remedies, such as bark, for instance, always attending to the due action of the bowels, without which tonics would be useless, and even injurious to the patient. To children, bark may be given in the form of extract, to the extent of from two to five grains, two or three times a day. The eyes should not be bandaged, nor should the matter be allowed to collect; cleanliness is of great importance in the treatment of this form of the disease.

With respect to the treatment of the sloughing cornea, some nicety will be required. When it is ascertained that the sloughing process is commencing, from the hazy or opaque appearance of the cornea, the antiphlogistic must be changed for a gently stimulating and tonic plan of treatment. Weak astringent collyria should be used to favour the throwing off of the sloughs. The solution of alum, of the nitrate of silver, and the undiluted liquor plumbi acetatis are the best. Observe the process of the sloughing from time to time: if there is a firm layer beneath, the patient is going on well, but if the sloughing has a flocculent, soft, ash-coloured appearance, in addition to mild stimulants to the part, tonic remedies, such as bark, ought to be employed.

In the treatment of purulent ophthalmia, it is of great consequence to pay strict attention to the changes which take place in
the symptoms, so that neither the depleting nor the tonic plan may be blindly continued. The treatment should be regulated by the violence of the symptoms, and by the changes which take place as the disease passes from the acute to the chronic form. The errors in the treatment of this complaint may be comprised in two words; they consist either in continuing the depleting plan too long, or in not resorting to it sufficiently early. If the antiphlogistic plan be not adopted at a very early stage of the disease, the tonic treatment will afterwards be of no service; and, on the other hand, if the depleting plan be continued too long, the restorative process, and those beneficial effects, which nature would otherwise assist in producing, will be checked.

SECTION III. STRUMOUS OPHTHALMIA.

Strumous, or scrofulous ophthalmia, is so called, because it is met with in those persons who are of a scrofulous diathesis—it occurs in children, and not unfrequently in adults. This inflammation is of the atonic character, that is, it is chronic from the commencement, it is one of atony from the beginning; and the reason why it is necessary to speak particularly of this complaint is, because there is one symptom invariably present,—intolerance of light. The patient cannot bear the least access of light; there is great difficulty of opening the lids, the orbicularis palpebrarum appears spasmodically contracted, and so difficult is it for a patient to open the eyes, that he can seldom do it: an adult may have sufficient resolution, but it is necessary that the eyes should be opened. The only way in which this can be done, is by fixing the head of the patient, when it is a child, between your knees, with the forefinger of the one hand to raise the upper lid, and that of the other to depress the lower, which will give you an opportunity of seeing the eye; but in doing this, great caution will be required to prevent eversion of the under lid, or any undue violence to the part. When the conjunctiva is examined, it is surprising to find how little it is inflamed, though the child does not raise its head
from the mother's lap. It will be necessary to examine the eye frequently during this state.

Disorganization of the different parts of this organ often takes place; the cornea, or rather conjunctiva covering it, becomes covered with an opaque capsule, with vessels shooting over the cornea, so as to give it an herpetic appearance; that is, there will be seen over the cornea yellow spots, which are deposits of lymph. These open into small ulcers, which are streaked with vessels carrying red blood. The eye becomes very painful, and extremely irritable, and there is often, in this state, intense redness of the conjunctiva. Under these circumstances, similar ulcers form in different parts of the cornea. The formation of these ulcers produces all the symptoms of acute inflammation of the eye, and the organ not unfrequently becomes slowly and gradually disorganized. So long, however, as the cornea continues bright, and of its natural colour, there will be no danger to be apprehended from the formation of ulcers. But it is of the greatest importance that the cornea should be narrowly watched, as, if the inflammation continues for a long time, ulcers are very apt to form on it. But the most distressing symptom, and the one about which the patient expresses the greatest uneasiness, is the intolerance of light.

Although this inflammation is one of the atonic kind, yet there exists considerable irritation. Depletion must be had recourse to, but not to any considerable extent; it will be right to apply leeches, but certainly blood-letting should not be pushed too far, and throughout the whole treatment it will be necessary to keep in view the nature of the constitution which is generally met with in scrofulous subjects; it is languid and debilitated; the digestive organs are deranged; there is loss of appetite—tongue white and furred; bowels torpid; secretions defective in quantity and in quality—skin dry and hot; in fact there is a good deal of fever present.

The mild depleting plan must be first adopted, regulated as far as the constitution will bear it: remove the symptoms of irritation; open the bowels freely by calomel purges, repeated more or less frequently as they improve the secretions. Alterative mercurial
medicines should then be given; and, if necessary, they should be
combined with rhubarb and magnesia, but not so as to produce
watery stools.

When the fever becomes diminished, the bowels perform their
natural functions, the tongue looks clean, and the skin assumes its
healthy feel, then begin with tonic remedies. Aromatic bitters,
combined with alkalies, will be found useful remedies. But, at
the same time, the state of the constitution must be amended by
attention to regimen and diet. The food should be light and nutri-
tious, clothing warm. Exercise should likewise be taken; not to
such an extent as to produce febrile excitement, but to invigorate
the health.

Sea-bathing will be of advantage; and when the constitution is
not in that state to bear the cold-bath, the warm should be used;
and if the patient is in a situation where sea-bathing cannot be re-
sorted to, he should sponge himself with tepid water, gradually
accustoming himself to the use of cold; by this means the general
health will be much improved.

As for the treatment of the part affected, it will be right to em-
ploy depletion at the onset, as far as the application of leeches. It
will be proper also to apply blisters behind the ears, or to the nape
of the neck; and in this complaint they are no ordinary remedy.
After the application of a blister, it is surprising how soon the in-
tolerance of light will vanish, even in children; their disposition
will rapidly alter, and the inflammation be so slight, that the eyes
may be opened without any trouble. Warm and moist applica-
tions are beneficial; the steam of water containing opium allowed
to go on the eyes will be good. About a drachm of opium dis-
solved in a pint of hot water, and the steam of it directed over the
eye, will relieve, to a considerable degree, the irritation.

But if any of these applications be used at the onset, they must
not be long continued before recourse is had to mild astringent col-
lyria. Their strength must be regulated by the feelings of the
patient; not so strong as to irritate, but to be followed by relief to
the part affected. The vinum opii is a remedy particularly adapted
to this complaint, at an advanced stage: it tends considerably to lessen the irritability of the part, and to increase the strength of the relaxed vessels. At the onset, however, a more active plan of treatment must be adopted: relief must be sought by the application of leeches and blisters, more especially by the last. It will be necessary sometimes to give mercury so as slightly to affect the mouth, remembering the state of the constitution in scrofulous persons, and taking great care that it is not pushed so far as to affect the general health.

The consequences of inflammation of the eye requiring distinct notice, and which are accompanied with equal or less inflammation of the conjunctiva, and kept up or excited by attendant circumstances, are now to be spoken of. In the first place, we shall treat of

SECTION IV. NEBULA.

This complaint is so called from the nebulous or cloudy appearance of the transparent part of the eye, which is produced by deposits of lymph into the conjunctiva covering the cornea. The membrane or layer stretched over the cornea will vary according to the more or less relaxed state of the vessels of the conjunctiva, which will be seen carrying red blood to the part. The veins corresponding to the nebulous parts will become turgid and prominent. If there be considerable inflammation, it must be removed by active means; and in these cases it will be proper to deplete. The inflammation, however, is generally of the chronic kind, and arises from a relaxed state of the vessels, which require stimulating applications, in order that they may recover their tone, and convey the blood uninterruptedly. If the vessels be stimulated, the blood will be likely to flow through the veins; the absorbents will be excited, and remove the effused lymph. By stimulating applications, the cornea will frequently be restored to the same state of transparency as before the attack. Care must be taken that in the treatment no undue degree of stimulus be employed; if there should be inflammation it will be increased, and the com-
plaint be as bad or worse than ever. A collyrium that may be
used, is one with the sulphate of zinc, containing about a grain to
an ounce of water, gradually increasing it in strength. One which
has been recommended, is that of the corrosive sublimate, with
a grain to an ounce of water. Calomel or levigated sugar has
been used in many cases with good effects. This is quite an old
woman's remedy, and has been recommended very indiscrimi-
nately. Unscientific persons—those who are not acquainted with
the nature of the disease in which it is useful—seeing it do good
in one complaint, think it will in all others of a similar appear-
ance, though essentially different in their character, and therefore
employ it in cases where it does harm, using it alike in a cicatrix
from ulceration as in nebula arising from a deposit of lymph. In
the one, if it be employed, loss of substance will be the result—
inflammation will be excited, and fresh ulcers will form. In the
other, that is, in nebula, it will often be of service, care being
taken not to produce an over degree of stimulus in the part.

SECTION V. PUSTULES.

Pustules are generally seated at the junction of the transparent
with the opaque cornea; but they may sometimes occur in the
cornea itself, or the conjunctiva covering it, or the ball. They
are seated in different parts. The appearances that they present
at first are red or yellowish spots arising from a deposit of lymph
in those parts, and are slightly elevated. There is considerable
turgescence of the vessels around them. If they occur on the
cornea, it will be nebulous and opaque; the vessels round the
cornea will be seen distended, carrying red blood, and having a
radiated disposition. If the lymph be not removed by absorption,
the pustules break, matter escapes, and ulcers form in their place.
Sometimes there is only one of these ulcers, frequently two, one
at each side of the cornea, just at the junction of the transparent
with the opaque cornea, and occasionally the cornea is even encir-
cled by them. Although the inflammation accompanying the form-
ation of pustules is not acute, yet it frequently happens that
there will be more or less pain on moving the eye, intolerance of light, and effusion of tears.

These ulcers are difficult to manage, as they often occur in the scrofulous habits of body and broken-up constitutions, and are apt to become chronic, and consequently difficult of cure. When the healing of the ulcers takes place, and the same state of body continues, they are soon reproduced, and the disease is greatly aggravated. As for the treatment this affection requires, it will be hardly necessary to say, that if considerable inflammation exists, depletion must be employed. The inflammation, however, is of the atonic kind. First apply leeches, but not in large numbers, so as not to carry depletion to too great an extent; it will be proper to evacuate the bowels, not by drastic purges, but mild aperients, and to attend to the secretions. Blisters will be useful if the sight be affected. When the state of the bowels has been regulated, begin with tonic remedies, and as early as possible with mild astringent collyria, and the best is the vinum opii. The only point to guard against is, that depletion be not pursued to too great an extent at the outset. The system must be invigorated by tonic remedies, and tone given to the vessels of the part.

SECTION VI. FUNGUS OF THE CONJUNCTIVA.

This appearance of the conjunctiva occurs in diseased subjects. The conjunctiva becomes loose and red, the vessels turgid with blood, and there is a fold of this membrane on the inside of the lids, which produces considerable irregularity on its surface—a morbid secretion is kept up on the part—and not unfrequently eversion of the lids is the result. Extraneous bodies often enter the eye, and disturb it considerably. To prevent this, and remedy the complaint, the loose portion of the conjunctiva should be removed, which is a very easy operation. An assistant holding the lid, you, by the means of a pair of forceps, raise the fold of the conjunctiva, and with a pair of curved scissors remove it. As to the after treatment, you must keep down inflammation, should it appear, by the means already recommended.
SECTION VII. GRANULATIONS OF THE CONJUNCTIVA.

These are nothing more than loose irregularities of this membrane where it lines the lids. These projections continue to pour out a portion of morbid secretion, which stimulates and irritates the whole eye; the palpebral conjunctiva becomes altered in its texture, and its surface is covered with fleshy elevations, having the exact appearance of granulations. These granulations covering the surface of the conjunctiva lining the lids are constantly rubbed over the globe of the eye whenever it moves, producing pain and irritation, and keeping up morbid secretion, and, in fact, giving rise to chronic ophthalmia. Thus easy access is afforded to extraneous bodies, nebulous opacities form on the cornea, vessels will be seen shooting over it, and these will be quite in a varicose state, enlarged, and having a knotty appearance. The granulations, if not removed or remedied, produce ultimate blindness.

Considerable advantage is said to be derived from removing the granulating surface of the conjunctiva by the lancet, or by a pair of curved scissors. Touching the granulations with nitrate of silver or sulphate of copper will tend materially to keep them down. The liquor plumbi subacetatis, applied to the surface of the granulations, has been tried by Mr. Tyrrell with advantage. The result of Mr. Green's experience has been to confirm this statement. If the vessels on the cornea be numerous, it will be proper to divide the trunks which supply them. This is a very simple operation. Raise the lid and press on the globe, by which means it is distended and projected forwards; then carry a sharp curved instrument round the outside of the cornea, and divide the vessels, so that they shall not reunite. A bar of lymph is thrown out, which turns the vessels from off their course, excepting, perhaps, the small ones, which often reunite. It will be necessary, perhaps, to repeat it. Cases of this complaint are difficult to cure. These are, then, the remedies to be used: removing the granulations, applying caustic applications, and the division of the varicose and
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enlarged vessels. These may be aided by setons, issues, blisters, and attention to the general health.

SECTION VIII. PTERYGIUM.

This is all of the triangular shape, and may be divided into the membranous and fleshy. The first has the appearance of a thin film of minute vessels converging towards the cornea. The usual seat of this affection is towards the inner canthus, that is, with the base at the canthus and the apex against the cornea. It is always of a triangular shape, and the vessels proceed from the base to the apex. The fact is, that pterygia do not long exist before they produce a nebulous state of the transparent part of the eye by deposits of lymph, and then of fluid. The conjunctiva and sclerotic coat become loaded with vessels, and if this affection is not remedied, vision becomes impaired, and is ultimately lost. The fleshy pterygia differ from the membranous, and are more vascular. They first appear of a yellowish colour. Then the vessels running through them become large, and they have a red appearance; but always retain their triangular shape. When the disease has proceeded far on the transparent part of the eye, the only plan to adopt will be the removal of a part of the pterygium. This consists simply in raising the membrane as near as possible to the cornea, and cutting it through while suspended. When the pterygia are fleshy, more care must be taken in dividing them; they must be divided near to the margin of the cornea, and turned back from the apex towards the base.

CHAPTER IV.

INFLAMMATION OF THE PROPER TUNICS.

SECTION I. INFLAMMATION OF THE CORNEA.

At the outset, in inflammation attacking the transparent cornea, there is a hazy appearance, the cornea loses its natural lustre, and
in a short time there may be discovered on its surface, vessels carrying red blood, and then the symptoms will be the same as those of inflammation in general; the patient will complain of intolerance of light, and also have effusion of tears. When the inflammation of the cornea continues, matter very frequently forms between its lamellae, and the appearance which it then assumes is called onyx or unguis, from its resemblance to a nail; the matter is to be very distinctly seen in the transparent part of the eye, and gradually extends till it occupies one third or fourth of the cornea. If the eye be placed in profile, yellowish spots may frequently be observed, which are usually seated at the anterior part of the cornea, and if gentle pressure with a probe be employed, the fluid may be felt fluctuating within. In the various positions of the head, the matter does not shift its situation, but remains in the same spot. By proper treatment the matter often becomes absorbed, but it not unfrequently makes its way externally, or an opening is formed internally, and the matter then is effused into the anterior chamber of the eye.

SECTION II. ULCERATION OF THE CORNEA.

This disease is the common consequence of inflammation of the cornea; but it is very frequently produced by the contact of matter in purulent ophthalmia, and the irritation of lime, or by any sharp pointed bodies which may be insinuated into the cornea; or, in fact, any irritating substance, mechanical or chemical, that may be introduced into the eye. The inflammation produces the formation of pus—this breaks, and an ulcer is formed. In ulcers of the cornea the edges are rugged, uneven, and elevated, the ulcer itself having an ash-coloured appearance, and the patient complaining of great pain; there will also be a discharge of a good deal of acrid and irritating matter. In general there will be no difficulty in distinguishing ulcers of the cornea; put the eye in profile, take a side view of this organ, and the ulcer will be seen with the appearances already described. The situation of ulcers of the cornea varies; very frequently they are at the superior portion, and
affecting only the external lamellæ, in other cases spreading over the whole cornea, and penetrating into the anterior chamber, by which means the aqueous humour escapes, and the iris is often protruded: sometimes even the opening becomes enlarged, and the crystalline lens and vitreous humour escape. The ulcers vary in their appearance, some being large and others small, and those which are of small size, on cicatrization, do not materially obstruct vision, whilst those that are large, when healed, produce a nebulous appearance which destroys the power of sight.

The treatment required in inflammation of the cornea does not differ materially from that of inflammation of the conjunctiva, or any other part of the eye, and therefore it will not be necessary to recapitulate the means necessary to be adopted: rely on the efficacy of a strict antiphlogistic plan, and when the acute inflammation has been subdued, on the use of mild astringent collyria. When ulcers, however, form in any part of the cornea, it will be proper to use active means, if they be accompanied by acute inflammation; but most frequently they are accompanied by chronic ophthalmia, and have a disposition to spread rather than heal. In these cases astringent lotions will be of great service; but of all remedies in ulcers of the cornea, the nitrate of silver is the one on which you are to depend; it is generally used in a state of solution, about two grains to an ounce of water, or it will be better to begin with a grain to an ounce, regulating the strength in proportion to the degree of irritation it may produce. Scarpa gives the preference to the caustic itself in the treatment of the ulcers of the cornea; the caustic is to be cut to a sharp point, and the ulcer to be touched with it. An eschar forms, which, in the course of two or three days, falls off, and the symptoms of the disease return as before; the caustic is again to be applied, and to be repeated a third time, if necessary. The ulcer, by this means, loses its ash-coloured appearance, the edges become regular and even, and it rapidly heals. When ulcers of the cornea are attended by acute inflammation, it will be necessary to employ bleeding, by leeches, before the use of astringents, and at the same time to keep the
bowels regular by mild aperients. During the progress of the ulcers, it will be necessary to watch them very closely, and examine them frequently; but in doing it great caution must be used, lest the eyelids become everted. When the ulcers heal, it is by cicatrization, as in any other part of the body, and afterwards specks are left which are nothing more than rounded spots of coagulable lymph, and are denominated leucoma or albugo; and in these cases the rays of light are not prevented entering the eye, except when the spots are on the axis of vision, and then they are interrupted.

SECTION III. STAPHYLOMA.

In this disease the cornea becomes opaque, considerably elevated, and altered in texture. The eyelids are prevented from being closed; there is perpetual irritation kept up by the friction of the palpebræ on the ball. This disease frequently comes on after small-pox, and is one of the sequelæ belonging to that formidable complaint. By the separation of the lids, extraneous bodies often enter the eye; irritation is produced by the friction of the lids and eyelashes—and thus a considerable degree of inconvenience is produced to the patient, and the eye kept in a state of chronic ophthalmia; and the sound eye becomes sympathetically affected.

In this disease the iris often protrudes; the vitreous humour is altered in texture; and the crystalline lens is projected forwards. In this complaint nothing can be done for the restoration of sight; and the only plan of treatment will be to remove the staphylomatous part, so as to return the eye within the orbit, and permit the use of an artificial eye. The operation is exceedingly simple; the surgeon first passes a needle with a ligature through the staphylomatous part, in order to steady the eye, and then with the other hand takes the cornea knife, and removes as much of the projecting part as may be necessary. The operation gives little pain; it generally happens that the iris adheres to the cornea, and that portion of it is removed. The crystalline lens escapes, together with a portion of vitreous humour, and the eye collapses, so that when the part is healed, an artificial eye may be worn. These are now
made so much to resemble the natural eye, that they may be worn without the deception being detected. This is the only treatment that can be adopted with any relief to the patient. The cornea sometimes becomes conical, or of a conoid shape; in these cases the cornea loses its natural lustre—the sight becomes impaired. Glasses afford no relief to the sight in this altered shape of the cornea; nor is there any remedy known that does. Mr. Green has seen several cases of this kind, and has not known any good result from the treatment that has been adopted.

SECTION IV. INFLAMMATION OF THE IRIS.

Inflammation of the iris, or, as it has been latterly called, iritis, is a peculiar and specific inflammation of the eye. The symptoms attending this complaint are in some cases with great difficulty recognised. In looking into the eye, the iris is observed to be changed in colour, or having a brownish hue, or rather a reddish brown colour, (this, however, varies according to the natural colour of the iris,) from the increased number of vessels on its surface carrying red blood. The iris itself is altered in texture, being puckered and thickened. These appearances are soon removed, and deposits of yellow lymph, resembling yellow tubercles, will be seen on the iris; the pupil becomes irregular, and altered in shape, and the pupillary margin of the iris thickened, and turned back towards the posterior chamber. These, then, are the principal symptoms by which iritis may be recognised; but, besides these, the aqueous humour becomes turbid, and the ciliary vessels on the surface of the sclerotic form a zone of vessels immediately surrounding the upper part of the cornea, which have a different appearance from those in inflammation of the conjunctiva, the latter having a tortuous course, whilst the others go in a straight direction. The conjunctiva partakes of the inflammation, and assumes a red appearance. The pain in the eye is not acute, but the patient cannot bear the light. There is also considerable constitutional irritation or fever, which may be known by the state of the pulse, and other symptoms. Inflammation of the iris often
comes on from very slight causes; it occasionally happens to those who have been under the influence of mercury, and in persons of scrofulous diathesis, or when mercury has been pushed to an un-
due extent.

Iritis has, in consequence of its occurring so frequently after syphilis, been classed as a secondary symptom of that complaint: Mr. Green entertains considerable doubt on the subject, for he says he has never met with it in a person labouring at the same time under any other secondary symptoms of syphilis, with eru-
tions or nodes on the bones: and also has never met with a case of iritis after syphilis, but when mercury had been previously given, and therefore he is doubtful whether the inflammation of the iris was the effect of the mercury, or of the original disease for which it was given.

Iritis is not unfrequently accompanied by inflammation of the tunics of the eye—what may be called *ophthalmitis*, or deep-seated inflammation of the globe of the eye. In this complaint the scle-
rotic appears reddened—the cornea is dull, and the capsule of the lens itself becomes opaque: all these participate in the inflam-
mation. There is deposition of lymph on the edges of the iris, and there are also adhesions of it in some places to the crystalline lens. The sclerotic coat, however, is particularly inflamed: the vessels may be seen carrying the blood in a straight course, while those of the conjunctiva are tortuous. There is pain in the eye, intolerance of light; also these symptoms, together with a turbid state of the humours, are sufficient to inform one of the presence of inflammation of the sclerotic coat: the patient also labours, at the same time, under great febrile excitement. This inflammation is often attended by a disorganization of the organ.

The result of this severe form of inflammation, if it be not checked, is effusion of lymph or matter into the anterior chamber of the eye, producing what is technically called *hypopium*. In these cases the matter may be easily observed, and sometimes there is so much as to conceal the edges of the pupil and the iris.

Of course the first part of the treatment will be to relieve the
irritation of the part by blood-letting, both general and local; and, in fact, all the steps of depletion must be adopted, as in other inflammations of the eye. But there is one remedy above all others in this complaint on which you are to rely, and that is mercury: it must be given so as to affect the constitution, till the gums and mouth are sore, or the saliva begins to flow, which will be the signs of it. In iritis, this medicine must be given, whatever quantities may have been taken before. The best form in which it can be exhibited is that of calomel; let it be given internally after the bleeding in the dose of two or three grains, combined with about a third or a quarter of a grain of opium, so as to prevent its acting on the bowels.

In order that the calomel may affect the system, it must be given every fourth or sixth hour, till the mouth is sore; in more chronic forms of this complaint, it may be given less frequently. As soon as the system has become affected, the zone of vessels will gradually disappear, the lymph become absorbed, the aqueous humour become clear, and the cornea lose its hazy appearance. Other remedies have been recommended, but the exhibition of mercury alone can be relied on. The belladonna will be found a very useful adjunct in this complaint; by dilating the pupils, the adhesions are often prevented from forming between the iris and capsule of the crystalline lens, and when they are formed, it tends to elongate the adhesions. The belladonna should be applied, in the form of extract, around the eye, morning and evening.

SECTION V. AMAUROSIS.

By amaurosis, is meant partial or total loss of vision, arising from paralysis of the optic nerve or retina; and this is produced by a congestion of the vessels of the part, or minute alteration of its structure. The symptoms distinguishing this complaint are few, and therefore require to be well known. The pupil is generally dilated and motionless; the iris is nearly immoveable, acts very little, and vision is completely destroyed. There is also
slight strabismus. In amaurosis, there is frequently the sensation as if a cloud were before the eye, which is termed caligo; and there is often a greenish appearance of the humours; this is named glaucoma, and depends on an alteration of the lens, or an alteration in the structure of the vitreous humour. The persons subject to this complaint are those who have been in the habit of viewing minute objects, or exposing the eyes to strong light. Persons affected with amaurosis are frequently troubled with false appearances—as flashes of light, or balls of fire before their eyes. The causes of amaurosis may be divided into three parts:—1st. Those which affect the retina or optic nerve. 2d. Those affecting the brain, or that part of it from which the optic nerves arise, the thalami nervorum opticorum. And, 3dly, Those affecting the body at large, or some particular organ, and thus sympathetically affecting the eye.

As causes of the first and second, we may enumerate:—

1. Lesion, extravasation of blood, inflammatory deposition upon either of its surfaces, and loss of transparency of the retina.

2. Morbid growths within the eyeball, dropsy, atrophy, and all such disorganizations as directly oppress or derange the texture of the retina.

3. The state of apoplexy, hydrocephalus, tumour or abscesses in or upon the brain, the optic nerve or its sheath; and thickening, attenuation, absorption, or ossification of the latter.

As causes of the third:—

1. Temporary determination; vascular congestion or vacuity, as from visceral and cerebral irritation; suppressed or deranged, or excessive secretions, as of the liver, kidneys, uterus, mammæ, and testes; various forms of injury and disease; and sudden translations of remote morbid actions.

2. Idiopathic paralysis, suspension or exhaustion of sensorial power from various constitutional and local causes; from undue excitement or exertion of the visual faculty; and from the deleterious action of poisons on the nervous system, as lead, mercury, &c.
The third division, or functional amaurosis, admits of the following subdivisions:

1st. The symptomatic, or that which is only a symptom of some general disease or disorder of the system, as for example, general plethora, general debility, &c.

2d. The metastatic, or that produced by the sudden transference of the morbid action from another organ of the body; as, for example, from the skin, the testicle, &c.

3d. The proper, or that which immediately depends upon a peculiar condition of the retina; as, for example, the visus nebulosus, muscae volitantes, &c.

Amaurosis depending on a change of structure in the brain or eyeball, is an irremediable case. The same may too often be said of that which presents no evidence of structural disease; for there are certain cases purely functional, so nearly approaching in character to the organic class, as at once to convey the impression of their irremediable character. On the other hand, cases are of frequent occurrence which admit of material and decided improvement, and even of complete recovery.

The treatment of amaurosis is almost exclusively constitutional, and must be of the antiphlogistic kind. The cure, in fact, of amaurosis, like that of inflammation of the iris, turns upon two points; the employment of ordinary antiphlogistic means, that is, the abstraction of blood either generally or locally, with other antiphlogistic remedies, and afterwards, the use of mercury so as to affect the system; indeed, mercury appears as effectually to check the progress of inflammation of the retina, as it does that of the iris; and it acts as beneficially in checking the progress of the chronic inflammation of the retina, which is the ordinary cause of amaurosis, as in checking the progress of the more active affection which would constitute retinitis. In order to derive the full advantage which this remedy is capable of rendering, it is necessary in these cases to produce its peculiar action on the system, and sometimes to keep it up for several weeks. Such at least is the opinion of Mr. Lawrence, who says that "it is not
sufficient just to render the action of the mercury sensible on the
mouth, and then to discontinue it; pretty active salivation must
be kept up for weeks, in order to enable you to derive all the
benefit which the remedy is capable of affording.” Mr. Travers,
on the contrary, thinks that “no advantage is obtained by saliva-
tion;” he considers it positively hurtful; and that “when mer-
cury is beneficial, its efficacy is perceived as soon as the mouth is
sore.” The form of its administration must be regulated by the
circumstances of the case.

In the treatment of this disease, counter-irritants are sometimes
useful auxiliaries. These, if managed as the case directs, are of
great value; in some, as temporary irritants only, in others, as
irritants and drains. It may sometimes be necessary, in conjunc-
tion with other treatment, to apply a blister, every five or six
days, to the back of the neck. Other plans of treatment have
been recommended; cupping, issues, and setons, have been se-
verally employed with advantage. The employment of electricity
also has been recommended, but has hitherto been attended with
little or no benefit.

The constitutional treatment necessary in amaurosis is various
according to the circumstances. Extremes, it is said, meet; and
it is certain that a strong and delusive similarity often prevails
between the signs of diseases, which result from conditions dia-
metrically opposite. In cases of general plethora and of cerebral
compression, the treatment is obvious enough. Under an idea
that the deficient state of vision arises from weakness of the
nerve, all kinds of tonics, stimulants, antispasmodics, have been
tried without any good result. Neither has the emetic practice,
recommended by Scarpa, been successful in this country. In
most of these cases, we must depend, first, on the regulations of
the visceral functions; and secondly, on the employment of such
restoratives as the system requires and can bear. The blue pill,
with colocynth, rhubarb, or aloes, and the combination of soda
with rhubarb and calumba or gentian, are best adapted to the
former purpose. The exhibition of general tonics is often strongly
indicated, and much benefit has been derived from the mineral acids, bark, steel, when admissible, and arsenic after a due regulation of the digestive functions.

Superadded to the entire repose of the organ, the natural tonics, viz., a pure dry atmosphere, the cold bath, horse exercise, nutritious diet, early and sufficient rest, agreeable society, and a mind as much as possible diverted from the object upon which it is unfortunately and pertinaciously prone to dwell. These are of more avail than drugs; and some lighter forms of sympathetic amaurosis are as effectually cured by them, as by blue-pill and rhubarb, and on the self same principle.

CHAPTER V.

AFFECTIONS OF THE HUMOURS OF THE EYE.

Having described the affections of the coats of the eye, it is necessary, in the next place, to treat of those of the humours of the eye. Very little, however, can be said of the aqueous and vitreous humours, as most of the diseases to which the humours are subject, attack the crystalline lens, or its capsule.

SECTION I. HYDROPTHALMIA.

The aqueous humour is sometimes the subject of an accumulation which is known by the name of hydrophthalmia, or dropsy of the eye; and consists of an increased secretion of this humour. The symptoms of this complaint are—that the eye becomes more distended than natural; the cornea widened; the sclerotic coat attached to the cornea has a blue tint or cast; the sight is affected; the motions of the iris impaired; and the disease at last terminates in amaurosis. On what this complaint depends, it would be difficult to say; it is generally preceded by chronic ophthalmia.
The remedies recommended for this complaint are various, of the most opposite kind, and have been tried generally without any good effect. Puncturing the cornea, at a short distance from the sclerotic, has been tried, and it is said with success. Mr. Green has seen several cases of this affection, in which no benefit whatever was derived from any means that were employed.

The vitreous humour is occasionally affected. There is sometimes a deficiency of this humour, arising from part of it being lost in the course of an operation: and the quantity lost is often so considerable, that the part supported by the aqueous humour is not sufficiently firm to keep up the natural roundness and plumpness of the eye. The medium of refracting the rays of light is destroyed, the sight becomes impaired, and glasses afford no relief.

There is the tremulous iris after couching, arising from the same cause as the preceding affection. Another change which takes place in the vitreous humour is that known by the name of glaucoma.

SECTION II. GLAUCOMA.

In this complaint the vitreous humour becomes altered in texture, more dense, and presents a sea-green hue, and the pupil is dilated. This disease has often been mistaken for cataract, and a person affected with it is frequently supposed to have a cataract in its incipient stage. On examining the eye minutely, this greenish appearance may be observed to be behind the crystalline lens, and posterior to the seat of the cataract; it may be, however, mistaken for many diseases, and has a greater resemblance to cataract than any other. Glaucoma remains without any change by which it may be distinguished from fungus of the eye, which will be described presently. The diagnosis is not difficult.

SECTION III. CATARACT.

By cataract, is meant a partial or general opacity of the crystalline lens, or of its capsule, or of the liquor Morgagni which intervenes between them, or of all these taken together. Cataract from opacity of the humour Morgagni, is very rare, and in the be-
lie of some, purely hypothetical. This complaint seems to have been understood by Hippocrates; but the notions of Galen, and those who followed him, respecting cataract, were very confused; and it was not till the end of the 17th, or beginning of the 18th century, that the nature of this disease began to be understood, when Merry and Maitre-Jean, and others, gave fair accounts of this complaint.

The symptoms of cataract are unequivocal, and may be easily recognised. At first there is always defect of vision, and the patient sees things as through a mist, and requires a strong light to see them plainly; this symptom changes during the progress of the complaint, the patient being able to see better in a moderate than a strong light; and then a speck or opacity in the lens or capsule may be distinctly observed; it is generally in the centre of the pupil, and the situation of the lens; this gradually enlarges, and, in proportion as the opacity increases, the sight becomes more dim, and the capability of discerning objects diminishes. In the progress of the cataract, the patient can see better in a faint than in a strong light; and this is easily explained, because in the faint light the iris dilates, and the rays of light are transmitted through the circumference of the crystalline lens, which is not yet obscured.

But as these symptoms differ in the different varieties of this disease, this leads to the consideration of the different species of cataract: it is extremely important that they should be known, as the operation necessary to be performed depends on the kind of cataract which exists; but it is to be observed that the criteria are, to say the best of them, very fallible. On looking at a cataract, a surgeon cannot always be certain that it is of this or that kind, but on the whole is enabled to give a pretty good guess. The symptoms characterizing each kind will be described under their different heads.

There are four kinds of cataract: 1st, the hard or firm cataract; 2d, the fluid or milky cataract; 3d, the soft or caseous cataract; and, besides these, there is a fourth kind, the capsular cataract;
the three first forming in the lens itself, and the last in the capsule.

The last kind of cataract comes on after an operation or in consequence of it, and is also found in children, when it is called congenital cataract. This kind of cataract does not differ essentially from the other forms of capsular cataract, but is called congenital, on account of its occurring at a particular period of life, or children being born with it. This form of cataract also requires a particular kind of operation, and will be particularly spoken of.

Of the lenticular cataract there are three kinds, the soft, fluid, and hard. These different kinds of cataract occur at different periods of life. It is stated that the firm or hard cataract is found in advanced age, whilst the soft occurs at an earlier period. There is one circumstance respecting these different kinds of cataracts it is necessary to mention; that is, it is not at all common for one form to go into another—for the soft to go into the hard, for instance, is exceedingly rare. This remark is the more necessary, in consequence of an opinion which used to prevail, that a soft cataract became hard, and then it was said to be ripe. This idea is now given up, and experience proves it to be incorrect.

Let us now consider the different symptoms attending the different kinds of cataract.

a. Firm or Hard Cataract.

In this kind of cataract the lens acquires a greater degree of density or firmness than natural; and in undergoing this change, it becomes smaller and thinner, and more concentrated. If you look at the cataract, you will see that it has not the natural whiteness of that complaint: it has a yellow or brownish appearance, the colour of amber. The next particular to be observed is the interspace between the iris and front part of the lens, on account of the lens becoming thinner. The motions of the iris are free, there being no adhesions. There is generally some degree of vision, and the patient can often discern large and bright objects, and even differences of colour, and sometimes the shadow of
minute objects. When the light is faint, the patient can see more distinctly than when it is strong. This kind of cataract generally occurs at an advanced period of life. By these symptoms, then, may this kind of cataract be distinguished:—by its colour and size, the interspace between the front part of the lens and the iris; the vision being more or less distinct; and, lastly, by its occurring at an advanced period of life.

\section*{b. Fluid Cataract.}

This kind of cataract is always more or less fluid, and is called milky, from its white colour. The fluid cataract is not of equal density throughout. If the eye of a patient be examined with attention, a flocculent appearance will be observed, from specks or streaks consisting of solid particles of the lens, and these will move up and down in the various positions and motions of the head, and be removed out of sight; but on the head becoming steady, they again appear. This arises from their gravity; on motion, they sink to the bottom, and of course disappear. There will not be any difficulty in recognising this form of cataract. Besides these symptoms, the lens becomes enlarged and globular; and the increase of size is such, that the lens reaches to the iris, so that there is no posterior chamber at all. If the surgeon look at the eye in profile, he will see that the iris is protruded forwards; from this pressure the motions of the iris are sluggish, and in some cases prevented altogether. The size and shape of the pupil is altered. The rays of light do not pass into the eye, and the patient can scarcely tell the difference between light and darkness.

\section*{c. Soft or Caseous Cataract.}

This kind of cataract is of the consistence of firm jelly or cheese. It is uniformly opaque, and there is a milky whiteness, as in the fluid cataract; but the spots and streaks, sometimes observable in this form, never shift their position, as in the other; the lens also becomes increased in size. The posterior chamber is obliterated. There is no interspace between the fore part of the lens and iris.
The motions of the iris are performed with difficulty, from the size of the lens, and the rays of light are prevented from entering. The patients sometimes cannot distinguish between light and darkness; although they are seldom so blind as this.

d. Membranous or Capsular Cataract.

This form of cataract is not connected with the lens, but the capsule itself. This opacity may exist either in the posterior or anterior layer of the capsule, or combined with that of the lens, and thus produce cataract. In this last case there is no distinct mark of diagnosis; but when the capsule only is affected, the surgeon may offer an opinion. If the anterior layer of the capsule is opaque, it has the appearance of being superficial and close to the pupil, and appears rather nebulous. It does not quite lose its transparency, but becomes semi-transparent. When the posterior layer is affected, this appearance is deeper; being at a considerable depth, and having more or less of a concave form. There are also striæ passing in a radiated direction. If, then, the opacity be deep-seated, and the lens appears concave, the surgeon may conclude that the posterior layer of the capsule is opaque; but when this state is combined with opacity of the lens, the diagnosis will be difficult.

Another species of membranous cataract is, when the capsule becomes opaque, and the lens at the same time absorbed, and a tough, dense, membranous substance is formed, as in congenital cataract.

These are the different diagnostic marks for detecting the different kinds of cataract; and, from the nature of the observations, it will be evident how difficult it is to distinguish them. But it is necessary, as far as is possible, to be acquainted with the appearances each form of cataract presents, as the treatment or operation required must be adapted according to the kind of cataract.

The causes of cataract are in general very obscure. Cataract sometimes arises from obvious causes—_injury, violence, inflammation, or sharp-pointed bodies_ wounding the capsule of the lens, or
the lens itself, and consequently producing opacity of these parts. The opacity arising from this cause often becomes absorbed, and the case undergoes the natural process of cure without requiring an operation. It is produced too by inflammation of the globe of the eye; but then the cataract is capsular, and not lenticular.

Cataract, however, arising from these causes, is exceedingly rare; and by far the greater number of cases are produced, as it is called, spontaneously, or under circumstances which are too subtle for our cognizance. It has been said that where the eye has been tried a good deal and subject to much exercise and strong light, as in blacksmiths, glass-blowers, &c., that cataract is produced; this is exceedingly doubtful; and if it is so, there are many cases in which no such cause can be assigned. It is also not unfrequently congenital, and of course produced from none of the causes mentioned. It also runs through families, and appears to be hereditary. It has been shown that it may be produced by external causes which are obvious, yet it more frequently comes on without any assignable cause.

Of course, by this is meant a prognosis as to the issue of the case by an operation; it is desirable, therefore, to ascertain whether service can or cannot be afforded by the operation; whether the changes which the eye may have undergone from inflammation during the progress of the complaint, or the symptoms, are such as to preclude the chance of success if an operation were performed, and destroy all hopes of vision ever being regained. Now there are certain symptoms accompanying this affection, by which the surgeon is enabled to form a pretty accurate opinion as to the issue. There are some extremely valuable observations on this part of the subject to be found in Scarpa's work on the diseases of the eye.

The first circumstance which leads you to determine as to the success of the operation is, whether the loss of vision has been gradually supervening, and has always been in proportion to the opacity of the lens; second, whether the cataract has been accompanied by chronic ophthalmia, or any changes have been produced in the eye by it: if the cataract has been attended by a pene-
trating pain in any part of the eye, or orbit, or back of the head, which it will be necessary to inquire about; third, whether the motions of the iris are duly performed, in the different variations of the light; if not, fear may be entertained of the eye being amaurotic; fourth, if there is the power of distinguishing between light and dark, or the colour or forms of things, or the shade of passing objects.

These circumstances should be particularly inquired into; and if the patient has all, or the greater part of them—that is, if the defect of sight has been increasing just in proportion to the increase of the opacity of the lens, and the patient has had no pain in the head, and the motions of the iris are free, and light can be distinguished; then the surgeon may operate, and with the chance of success, as there are no evident reasons against it.

For by the first circumstance we learn that the vision has been impaired in consequence of the opacity of the lens; by the second, that there has been no disorganizing inflammation in the eye, or that the brain and origin of the optic nerves have been affected; by the third, that the retina is sound; and by the fourth, if the opacity of the lens be removed, that the retina will be in a state to receive the impression of external objects. But these signs are not so certain as they might appear, for the iris might act, and yet amaurosis exist: and if one eye were not closed, the motions of the iris of the other might be prevented, by sympathy from the other. Thus it appears that the state of the iris does not always determine the existence of amaurosis.

When there is cataract, the operation must be regulated by taking all the circumstances into consideration: by the figure of the cataract; whether there are any adhesions of the iris to the capsule of the crystalline lens; and especially by the patient being able to distinguish objects, and light from darkness; but though this is a favourable symptom, yet persons may have amaurosis, and be able to distinguish day from night, and even objects from one another. On the whole, it is a very favourable symptom, and when present, the operation may be performed. In general, when the case is
doubtful, the surgeon had better perform the operation, of course taking care to inform the patient of the state of the case: the pain is not great, and you will not leave the patient in a worse state than before the operation. It would be extremely culpable for any one to operate where it was quite apparent that no relief could be afforded; and yet individuals have operated where there was no more chance of doing good, than if the eye had been scooped out of the head—such men are unprincipled, and would undertake any thing for the purpose of gain.

Another question to be determined on is, whether the operation should be performed if one eye only is affected? The answer appears to be plain, yet there are some who contend that the operation should be resorted to when there is cataract in one eye only, and their principal reason is this: they say, that it is known a sympathy exists between the two eyes, and that if a morbid action is set up in one, it will be excited sympathetically in the other, and thus disease be communicated to the one which is sound, and an operation be required to be performed on it. This is scarcely a sufficient reason, because, under so little excitement, the chance of the other being affected is slight. The disadvantages of this plan are various; it is true that a sympathy exists between the eyes, and that if inflammation is set up in one, it will be excited by sympathy on the other, which may destroy the organ that is sound. But suppose success attends the operation, what is the effect? the focus will be different, and the patient will not be able to use both eyes at the same time.

Next, where there is only one eye sound, and it performs its office well, and vision is good, it will be better to wait till it becomes dim; then the operation for restoring the patient to sight may be performed, and two chances be in the patient's favour. Therefore it seems that in performing the operation for cataract, where one eye only is affected, the patient is exposed to the risk of losing the sight of both. The plan that appears to be the best is, not to operate except both are affected; then the operation may be safely performed.
CHAPTER VI.

OPERATIONS FOR THE CURE OF CATARACT.

Before speaking of the operation for cataract, it will be expected perhaps to premise by saying something of the treatment; but besides an operation in this complaint, very little else in the way of treatment will be of use. Various plans of treatment have been adopted, but without success; therefore, it is better at once to describe the operations. The operations for cataract are three in number—first, depression, or couching, by which the cataract is removed from the axis of vision; second, extraction, which consists in making an incision through the cornea; third, the operation for the solution of the cataract.

SECTION I. OPERATION FOR DEPRESSION, OR COUCHING.

This mode of operating consists in removing the opaque lens out of the axis of vision, by depressing it into the vitreous humour: this is done by a needle, of which there are three different kinds now employed, Hey’s, Scarpa’s, and Beer’s needles.

Hey’s needle is about seven eighths of an inch in length; it is rounded except at the point, where it is flat for the eighth of an inch; it terminates by a semicircular cutting edge, which ought to be exceedingly sharp. Scarpa’s needle is more slender than the other, and curved at the point. When you look at it sidewise, it presents a flat convex appearance on the dorsum, it is of a triangular shape towards the point, and has also a concavity; it is sufficiently strong to depress the lens. The next is Beer’s spear-pointed needle; it is narrow at the neck.

Mr. Green gives the preference to the latter instrument; a surgeon is not so likely to wound the ciliary ligaments or processes with it. The needle is the only instrument required; some use a speculum, but, excepting in children, this will not be of much use. Previous to the operation, very little preparation will be necessary;
of course, the surgeon should ascertain whether the patient is in good health, see that the bowels are regular, and that all the functions are properly performed.

We next come to the mode of performing the operation. The light, and the position of the patient and operator, are extremely important, and all to be attended to. The light should be clear, distinct, and full, but not vivid, and it should not fall on the centre of the eye of the patient, but laterally, else it would produce a dazzling, and unsteadiness of the organ. The patient should be placed on a low seat with a high back, and the head resting against it, or the body of an assistant. The operator should be on a high stool, or at least of sufficient height to enable him to put one foot on it, and rest his elbow on the knee opposite to the eye to be couched. Having thus prepared himself, the operator holds the instrument between the thumb and fore-finger, the assistant passing his fore-finger round the head of the patient, raises the upper lid by a fold of skin, and presses it gently against the superciliary ridge. The patient is now directed to look inwards towards the nose, and the operator, resting his little finger on the upper part of the chin of the patient, penetrates the sclerotic coat about a line and a half from the junction of the transparent with the opaque cornea, and a line below the transverse diameter of the eye.

In the first place, the needle is introduced here, just where the retina terminates, and the ciliary ligament commences, so that these shall be avoided; and, 2dly, for the purpose of not wounding the ciliary artery, as it goes along the middle of the external convexity of the eyeball, between the sclerotic and choroid coat. In using Beer's needle, it is introduced with the edge laterally, and its surface upwards and downwards, and directed towards the middle of the globe of the eye. It must be moved slightly between the fingers; a piece of ivory or brass at the handle showing the disposition of the cutting edges, and then the point carried inwards parallel to the iris, and so as to cover the posterior chamber; the instrument will be now visible through the pupil. When this is the case, the operator must raise the needle upwards, and then
depress it downwards, and backwards, and a little outwards, by which means the crystalline lens becomes pushed into the vitreous humour. If the lens should rise from its situation, it must be again depressed, and when it is safely lodged in the vitreous humour, the needle must be withdrawn.

Some continental surgeons perform the operation of *reclination*, which consists in turning the lens over, and pushing the upper edge backwards, and the lower forwards, and likewise in puncturing the cornea instead of the sclerotic; the best plan is that recommended by Scarpa.

The after-treatment is very simple, and consists in a single fold of linen, moistened in cold water, being applied to the eye. The patient is also to be put in a dark apartment, and narrowly watched, in order to see if inflammation supervenes; very frequently none arises.

**SECTION II. ON EXTRACTION OF THE CATARACT.**

This operation was first performed towards the end of the seventeenth century; it was not, however, generally known till somewhat later, when it was brought into repute by Deville, who published the method of performing it. Considerable improvements were subsequently made in the mode of performing it by Wenzel, who practised it with great dexterity, and astonishing success. There seems to be no necessity for preparing a patient for this operation, beyond taking care that his bowels be duly evacuated, and that he has not used any unusually stimulating diet previous to the operation. It would be highly improper to perform it, if the patient was at the time labouring under any other complaint or morbid affection; means should be taken to remove any complaint of this kind before the operation is attempted. Beyond these precautions, however, no preparatory treatment will be necessary, though I am aware that much stress was formerly laid upon this point. Several instruments will be required for the performance of this operation, which is a more complicated one than couching.
In the first place, a cornea knife will be necessary; the knife used by Wenzel was something like a bleeding lancet; the blade, however, was neither so long nor so broad, and the edges were straight. Ware's knife was an improvement on Wenzel's; it is much less spear-pointed; the edges are straight as in Wenzel's, but while the lower edge is cutting, the superior edge is only cutting towards the point. From the point towards the handle there was a gradual increase in the size of the knife, a circumstance upon which Ware particularly insisted, in order that the knife, on being carried onwards, might always follow up the opening, so as to prevent the escape of the aqueous humour.

Wenzel's knife, however, and Ware's improvement upon it, are greatly inferior to the knife contrived by Beer, the celebrated oculist of Vienna. This knife is very different in shape; the upper edge is quite straight, while the lower edge is made straight and oblique; the whole of the lower edge is cutting; the upper edge is cutting towards the point, and the size is accurately increased from the point towards the handle, so as to fill up the opening, and prevent the escape of the aqueous humour. Beer's knife is preferable to either of the others, because there is a much greater extent of cutting surface, so that the section of the cornea is completed in a shorter time and in a safer manner; it is besides capable of being made with much greater accuracy.

A speculum was sometimes used in this operation, but it is not at all necessary; in fact, all specula are objectionable, as they are likely to produce undue pressure on the globe of the eye. The next instrument is a pair of curved scissors, in order to enlarge the opening made into the cornea, if it should not be of sufficient size to extract the cataract. A minute curved needle will be required, in order to scratch the capsule of the crystalline lens; a curette, or scoop, to remove any opaque fragments of the lens, and a pair of minute forceps, of which the best construction is that recommended by Beer, to extract any portions of opaque membrane from the capsule of the lens. These are the principal instruments required in this operation.
Let us next consider the mode of performing it. The position of the patient should be nearly the same as that in the operation for couching; he should be placed opposite a window, so as to admit a full, clear, but not too vivid light. It should not be a reflecting light, so that if the sun should happen to shine, a north window should be chosen; the inner side of the eye towards the nose, where the point of the knife is to be carried through, should be well brightened. The patient should be seated in a low chair with a high back, his head resting against it, or firmly supported against the chest of an assistant. The operator should place himself behind the patient in a chair of sufficient height to enable him to plant his foot conveniently on a stool, and resting his elbow on the knee opposite to the eye to be operated upon, bring his hand towards it. The assistant should then place his hand behind the patient's head, and with the extremity of his fore-finger gently raise up the lid without making pressure on the globe. The operator then takes the knife in his right hand, if it be the left eye which is to be operated upon, and in his left if it be the right eye, in the same way as he would take a pencil between his fore-fingers and thumb, resting his little finger upon the malar bone.

The first thing which the operator then does is, to make what is called the punctuation of the cornea. He introduces the point of the instrument at the distance of half a line from the anterior junction of the cornea with the sclerotic coat, and passes it in a direction nearly parallel to the iris, and before it with a little obliquity, through the anterior chamber to the opposite or nasal side. In making the section of the cornea, the knife should be carried onwards, without any downward motion; and as soon as the section is completed, the lid should be allowed to drop over the fore part of the eye, to prevent the escape of a portion of vitreous humour. If there should be any spasm of the part, or any unsteady motion of the patient, the operator waits till the eye is quiet, and then introduces the curved needle with a convexity under the flap of the cornea; and turning the point towards the
fore part of the capsule, moves it upwards, and downwards, and laterally from side to side, making a sort of crucial incision. He then squeezes out the cataract by making gentle pressure on the globe above and below, until the lens is lifted from its bed, and passes through the opening of the cornea upon the cheek of the patient.

All that then remains to be done is to examine whether there are any opaque fragments of the lens left; if there are, they must be scooped out by the curette; if not, the upper lid is to be rubbed over the surface of the cornea. If there is any portion of opaque membrane remaining, it must be removed by the forceps, and in this way the operation will be completed.

Many untoward circumstances, however, frequently interfere with the success of this operation. In the first place, the section of the cornea may be too small; in which case the surgeon will either be unable to dislodge the cataract, or so much force will be required for that purpose as is likely to produce serious inflammation, and such a degree of disorganization as will destroy vision. The section through the cornea should be about nine-sixteenths of a line, or one-sixteenth more than half a line from its junction with the sclerotica; the point of the instrument is introduced a little below the transverse diameter of the eye, on one side, and should come out a little above it on the other. If it should appear when the section of the cornea is completed, that the opening is not sufficiently large, do not hesitate to use the scissors, in order to make it large enough to admit the passage of the cataract.

The second untoward circumstance which occasionally interferes, is the premature escape of the aqueous humour, either from the unsteadiness of the operator, or from some defect in the knife. On the escape of the aqueous humour, the iris loses its support, and becomes prolapsed. When this happens, the way of preventing any mischief will be, not to continue the incision, but to rub the cornea with the point of your finger, by which the prolapsed iris will be stimulated to contract; and on this being removed out of the way, the operator may complete the incision. This is the expedient re-
commended by Wenzel and Ware, and it answers the purpose extremely well.

The third unfortunate circumstance which sometimes occurs is the loss of a portion of the vitreous humour, arising from some undue pressure on the globe of the eye by the operator or assistant, or from some spasm of the muscles of the eye, though the last cause seldom happens. Another way in which this accident sometimes occurs, is when the needle is injudiciously used too near the circumference of the lens, and the capsule of the vitreous humour is torn through; so that when you make pressure on the globe, instead of the cataract coming forward, a large portion of vitreous humour is protruded. In this case the operator should not attempt to force out the cataract; but should endeavour to entangle it as much as possible, so as to prevent the escape of the vitreous humour.

The loss of the vitreous humour is sometimes occasioned by the use of the curette, in consequence of the instrument passing through the back layer of the capsule. The curette should never be used when the pupil is at all obscured; the field of the pupil should be perfectly distinct when that instrument is employed. The loss of a small portion of vitreous humour does not essentially interfere with the success of the operation; indeed, it has been said, and perhaps justly, that the loss of a small portion is rather beneficial than otherwise. It would be an extremely dangerous experiment, however, to endeavour to force out only a certain quantity. The loss of a portion of this humour should not prevent the operator from completing the operation in the best possible way, by removing all the loose fragments of the opaque lens, and the different portions of opaque membrane or capsule.

Another unfortunate circumstance which sometimes happens, is the introduction of the cornea knife between the lamellae of the cornea; the consequence of which will be, that the section of the cornea will be very small and imperfect. There are various other circumstances which may interfere with the success of this operation, which need not be detailed. Dexterity in performing it can
only be acquired by practice. Wenzel, perhaps, rather exceeded the mark, when he said that the student must poke out a hatful of eyes before he can hope to perform this operation with success; but, undoubtedly, considerable practice is necessary to enable him to acquire dexterity in performing it. Whenever any unfortunate circumstance happens, the operator should be perfectly calm, cool, and deliberate; close the eyelid; consider what is best to be done; and having made up his mind on that point, proceed with firmness and decision in the operation.

With respect to the after-treatment, the principal object will be, as far as possible, to prevent inflammation. A compress of fine linen or cambric, kept wet with cold water, should be applied to the eyes, or rather to the eye opposite that which has been operated upon; it should be fixed by means of a bandage, carried round the occiput, crossed in front, and pinned on the sides of the nightcap. The patient should be carried to bed after the operation; placed in the recumbent posture, with his head a little elevated, and the room should be darkened. He should be allowed nothing but barley-water, tea, or water-gruel, for the first few days; and if there should be any symptoms of inflammation, such as pain, a sensation as if there were some external body in the eye, accompanied with quickness of pulse, a quantity of blood should be immediately taken away from the arm.

It will be better not to disturb the bandage, or raise the lid to examine the eye, for at least three days, unless the patient should feel any considerable pain or irritation; for, in that case, it would be advisable to ascertain the cause by examining the eye. The patient should be kept in bed in the recumbent posture for five days, and not even be suffered to rise for the evacuation of his faeces; a bed-pan should be used for that purpose. At the end of that time he may get up to have his bed made. The best way of preventing irritation is carefully to avoid making any undue pressure on the globe of the eye.

Great care must be taken, in adjusting the bandage, not to depress the lower lid, by which means the section of the cornea
may be brought over, and the adaptation of the cut edges prevented. Loose eyelashes are sometimes a source of irritation, and it will be right to examine whether there are any such before the operation; if there should be any tendency to inversion of the lid, you may prevent the lid from rubbing against the surface of the globe by means of a bit of adhesive plaster fastened to the cheek. It has been already stated that to operate, if one eye is sound, is not advisable; neither is it right, if there should be a cataract in each eye, to operate on both at once, unless the patient should particularly desire it.

SECTION III.—ON THE OPERATION FOR PROCURING SOLUTION OF THE CATARACT.

The third operation is that for procuring solution of the cataract, which is particularly adapted to the cataracts of children. This renders it necessary to make some observations on congenital cataract. Children are not unfrequently either born with cataract, or with a disposition to cataract, which speedily makes its appearance. Indeed, it is not common to find an absolute opacity of the lens, or of the capsule containing it, at the birth of the child; the cataract usually makes its appearance within a few months, or at least within the first few years, from the birth of the child. In some instances there seems an hereditary predisposition to this disease, several children in the same family being affected with it. The nature of the cataract may be firm, soft, or fluid; and it may be lenticular or capsular, as in the adult.

By far the most common form, however, according to Mr. Saunders, who has given particular attention to cataract in children, is the capsular. In general, he found the lens itself more or less absorbed, the anterior and posterior layers of the capsule being opaque and adhering. The appearance of the cataract is somewhat different from that in the adult; there is an opaque nucleus either at the centre or some part of the circumference, and the rest has an unequal opacity, or streaked reticulated appearance. Another circumstance peculiar to congenital cataract is the un-
steadiness and constant motion of the eye, which it is not difficult to explain. The eye has never been accustomed to have its vision fixed by objects, unless, perhaps, very imperfectly, and consequently the will has never been in the habit of influencing the muscles which give direction to the globe of the eye. Hence its unsteady and constant motion.

It was formerly deemed advisable to defer the operation for cataract in children, but Mr. Saunders has introduced a mode of operating in these cases which may be resorted to at any age. This is certainly one of the greatest improvements which have been made in this branch of surgery, not only because vision is extremely important for the purposes of education, but because, if the operation be delayed, a very considerable time will elapse before the patient can acquire a command over the eye, in consequence of the want of voluntary influence over the muscles. Another and more forcible reason, why this operation should not be delayed, is, that it is an universal law in the economy of nature, that all parts which are not exercised lose more or less of power; and, consequently, the retina, from not being accustomed to receive the impressions of light, loses a considerable portion of its power.

Mr. Saunders found that in many cases where this operation had been delayed, the patients retained no more power of vision than was sufficient to enable them to distinguish between light and darkness. The operation may in general be performed with a hope of success between the age of eighteen months and four years. Mr. Saunders's mode of operating is not confined to the cataracts of children; it may be employed also in the cataracts of adults, provided they are fluid, soft, or membranous cataracts.

This operation is not entirely new; in Mr. Pott's works, some instances are mentioned, where he performed a very similar operation. He tells you that, in cases where the cataract was too soft for depression, he sometimes lacerated the anterior layers of the capsule, so as to admit the aqueous humour and procure the solution of the cataract. Hey, Scarpa, and Ware, have performed
similar operations. We are not, however, to consider those as
the inventors of any practice who have merely employed it here
and there, without stating any certain rules for its general appli-
cability.

It is to Mr. Saunders that we are indebted for having shown the
principle on which he performed this particular operation, its ap-
plicability to cataract in children, and to some cases of cataract in
adults. He may, therefore, be justly considered as the inventor
of this operation, and is entitled to our respect and admiration for
the introduction of so material an improvement in this branch of
surgery.

The operation is very simple; it consists merely in making an
opening in the anterior layer of the capsule of the lens, breaking
up more or less the texture of the cataract and admitting the aque-
ous humour, in which the cataract is dissolved, and by this means
absorbed. It may be more properly called an operation for the
absorption, than for the solution of the cataract, since absorption
is the ultimate object of it. The instrument required is a needle,
very similar to that employed in the operation for couching; the
point, however, is somewhat different; its shoulders are made
cutting. It will be right, before the operation, to use belladonna
for the purpose of dilating the pupil, so that the cataract may be
distinctly seen. A small quantity of the extract of belladonna,
softened to the consistence of cream, may be introduced into the
eye, or smeared round the lids.

In operating on the adult, the patient should be placed in the
same position as in the operation for couching; children are better
placed in the recumbent posture, with the head fixed on a pillow.
Sometimes a speculum is required to steady the eye; Pellier's spe-
culum is the best for this purpose. The needle may be introduced
either in the same way as in the operation for couching, or else
through the cornea. In the latter case there are two modes of
operating, called the anterior and the posterior. In the former,
the needle is introduced at the distance of half a line from the
junction of the cornea with the sclerotica, carried parallel to the
iris, and turned inwards, so as to break up a portion of the capsule of the lens. In the posterior operation, the needle is carried through the posterior chamber, a little behind the iris, and the texture of the capsule is broken up in the same way, so as to admit the aqueous humour. If the cataract be fluid, it immediately mixes with the aqueous humour, and there will be no more trouble. As to the after-treatment, the principal object must be, as in the former cases, to prevent inflammation. It is better in this operation not to attempt to do too much at once; but rather to repeat it frequently, than to break up the texture too extensively at once.

SECTION IV. GENERAL REMARKS ON THE OPERATION FOR Cataract.

Having described these different operations, it may be necessary to consider which of them it may be most expedient to adopt. It appears that in those cases which admit of the operation for solution, namely, fluid, soft, and most cases of membranous cataract, that operation is greatly preferable to any other. Soft, fluid, and membranous cataract cannot be depressed. It is true that the operation for extraction might be performed, but it is to be considered that the operation for solution is much more easy, and that it does very little injury to the eye.

In firm cataracts, where it is a matter of indifference whether the operation for depression or extraction should be performed, that for extraction, supposing it to be equally well performed, is undoubtedly preferable, because the disease is entirely removed by it. It is not always, however, a matter of indifference, for there are many cases in which it would be extremely imprudent to attempt the operation for extraction; as, for instance, in cases of adhesion of the iris to the cornea, or where the cornea is very flat, and the anterior chamber necessarily small, or in cases of contraction of the pupil, myosis,* or arcus senilis.

* From Muyor, a disease of the eye, which consists in a contraction of the pupil.—Ed.
There are some cases in which the unsteadiness of the eye is so great, either from spasmodic motions to which the patient is subject, or from invincible fear or stupidity, that it will not be advisable to attempt the operation. These remarks are borne out by the case of a woman in St. Thomas's Hospital, who had cataract in both eyes, and was operated on by Mr. Green. When the operation was proposed to her, she immediately consented; and, supposing that she would have sufficient resolution to go through with it, he sat down with perfect confidence to perform the operation for extraction. She no sooner, however, felt the pain—pain it can scarcely be called—the uneasiness rather, arising from the application of the instrument—than she could not keep her head at all steady, but threw herself into all sorts of postures. He succeeded, however, but with great difficulty, in making a very indifferent section of the cornea, and in extracting the cataract from the eye. He was then induced to attempt the operation on the other eye; and if the patient was unsteady during the first operation, she was ten times more so during the second. The consequence was, that though he completed the section of the cornea in the second, he found he could not proceed without the risk of doing considerable injury to the part; and he thought it best to leave the cataract in its place.

Where there are no contra-indications to deter us from performing the operation for extraction, it is undoubtedly the most effectual operation, as it completely removes the disease; but then it requires much more skill and dexterity than the operation of depression; and the want of sufficient skill is more likely to prove injurious to the patient. The operation for depression is extremely easy, but it has its disadvantages. Not unfrequently the cataract rises again, and it will be necessary to repeat the operation. If the cataract be depressed on the retina, the patient will experience constant pain, which sometimes terminates in amaurosis. It sometimes happens, after the operation for couching, that the patient is seized with vomiting, accompanied with acute pain. This has been supposed to be the consequence
of wounding the ciliary nerves. Whether this opinion is well founded is doubtful, but it commonly happens, that when the operation is followed by vomiting, the cataract rises again.

No judicious surgeon will, indiscriminately, prefer one mode of operation to another; his opinion must be decided by the nature of each particular case. In general, where the nature of the cataract admits of it, the operation for solution is preferable. In cases where the operation for extraction is not contra-indicated, it will be preferable to that of depression, if the surgeon has had sufficient opportunities of acquiring dexterity; but if he has not been much in the habit of performing the operation, the operation for depression is the safer, though less effectual course.

SECTION V. OPERATION FOR ARTIFICIAL PUPIL.

Where, from some defect of the cornea or iris, or the parts connected with them, there is no passage for the rays of light, the operation for artificial pupil is required, which consists in making a section with a cutting needle through the iris, which, by the elasticity of its fibres, separates the edges, and makes a passage for the rays of light. Cheselden was the first surgeon who performed it. There are three modes of performing the operation:—1st, by a simple incision of the iris, technically called *corotomia*; 2dly, where a portion of the iris is cut away, which operation is called *corectomia*; 3dly, where the iris is turned away from its attachment to the ciliary ligament, which is called *coredialysis*.

The simple incision of the iris is seldom resorted to; the operation of excision of a part of the iris was recommended by Mr. Gibson, and is certainly the best when the case admits of it. Mr. Gibson's mode of performing it is, to make an incision with a knife, as near as possible to the iris, and then, making gentle pressure on the globe of the eye, so as to protrude the iris, to snip off a portion with a pair of scissors. If the iris was adherent, so that it could not be protruded, he hooked it for-
ward with a little hook, and then snipped away a portion with the scissors.

The operation of separating a part of the iris from its attachment to the ciliary ligament, may be performed with Scarpa's needle. The needle should be introduced on the outer side through the cornea, at the distance of two lines from its junction with the sclerotica, and carried across the anterior chamber parallel to the plane of the iris. The point is then to be directed through the iris towards the inner side, and then, carrying it backwards and outwards, the iris is to be detached from the ciliary ligament.

The excision of a portion of the iris is the preferable operation, but where the case does not admit of it, the detachment of the iris from the ciliary ligament is the next best operation. It is impossible to lay down general rules for these operations here, for the cases are so infinitely varied, that much must, after all, be left to the discretion of the surgeon, who should adapt the nature of the operation to the circumstances of each particular case.

CHAPTER VII.

AFFECTIONS OF THE EYEBALL.

SECTION I. ON FUNGUS HÆMATODES OF THE EYE.

The first disease deserving of our attention is the fungus hæmatodes of the eye, malignant fungus, or as it is called by some, medullary sarcoma, a disease which soon proves fatal, unless an operation be early performed, and even then the chance of success is extremely doubtful. No age appears exempt from this complaint, but it more frequently attacks the young; and a large proportion of the cases occurs before twelve years of age.
The first circumstance which attracts the notice of the patient is the vision becoming impaired. On looking into the eye at the commencement of this complaint, you see opposite to the pupil, and deeply seated, an appearance like a mirror, resembling an opacity of the lens, from which it is difficult to distinguish it. If the progress of the disease be watched, it will be seen that this appearance enlarges into a prominence, proceeding from the bottom of the eye towards the cornea, and as it reaches the lens, care must be taken that it is not mistaken for cataract. There is one appearance, however, at this stage, by which the one can be distinguished from the other; upon the opaque substance, or the retina, of which its covering consists, branches of the arteria centralis retinae may be seen ramifying.

The other symptoms are loss of vision, and the iris remaining immovable. As the prominence enlarges, the iris becomes protruded, and the cornea distended. The conjunctiva becomes inflamed, the eyelids vascular, and in a diseased state; and in process of time the cornea sloughs, an opening is formed, and a discharge of a ropy mucus first takes place.

The fungus does not always protrude through the cornea, but sometimes through the sclerotic, and then it has a purple, livid hue, and is covered by the conjunctiva. When the fungus increases in size, it assumes a dark red colour; its surface is unequal, and irregular; it bleeds at the slightest touch; the parts slough, and then there is a fetid, sanious discharge. During the progress of the complaint, the health becomes affected, the countenance puts on a sallow hue, and the patient wastes in flesh. This disease is accompanied, and generally preceded, by disorder of the digestive organs; the appetite is impaired; and there are present all the other marks of derangement of the general health. When the strength and health are broken up, the disease very soon comes to a termination. The close of the disease is preceded by hectic fever; as is that of most complaints from which the general health has suffered much during their progress. In fungus of the eye, the rest is completely destroyed, there is an affection of
the nervous system; and in children, convulsions come on, which terminate their existence. In all stages of the disease, there is a tendency to them, and they generally prove destructive to life.

If the appearances of the eye be examined, little difference will be found in them from those of fungus in any other part. There is a grumous appearance on the surface, and the fungus bears a striking resemblance to the medullary matter of the brain; not unlike cream to the sight. The appearances, however, vary in different forms of the complaint. No one texture of the eye is free from it. It frequently commences from the optic nerve, extends to the retina, sclerotic, and choroid coats; but, on examining a fungus of the eye, it would be difficult to say where it began, the disorganization is so complete; the retina is destroyed—the humours are absorbed—the choroid protrudes, and very little of the natural texture is left.

In some cases, the greater part of the anterior chamber is filled with a dark substance, like the pigmentum nigrum. In some instances, the disease extends along the optic nerve, which enlarges, becomes altered in texture—of a brown colour—and reaches the brain, which will also be affected by the disease. The only remedy in this disease is the extirpation of the eye, and this in the early stage. In most cases, the operation proves unsuccessful, in consequence of its not being performed sufficiently early, or before there is a disposition in the constitution to reproduce the disease.

SECTION II. CANCER OF THE EYE.

By cancer of the eye is meant, not cancer of the globe of the eye, for it rarely or ever commences in it; but it begins in the appendages and conjunctiva, and then extends to the globe of the eye; its common seat is in the conjunctiva. Cancer of the eye at the onset resembles a watery tumour with an ulcer on its surface, which has exactly the same appearance as ulcers in other parts of the body; therefore it will not be necessary to describe
them; it then extends not only to the globe of the eye, but to the palpebral lining, the lachrymal gland, the periosteam of the bones forming the orbit, and the antrum; in fact, the globe and its appendages become one entire mass of disease.

No good can be expected in the treatment of this complaint, unless the cancer be early removed by the knife. In the progress of the disease, the general health becomes broken up.

SECTION III. MELANOSIS OF THE EYE.

The eye is sometimes affected with melanosis, when it is converted into a peculiar black texture, a substance of sooty blackness. Should this affection be confined to the globe of the eye; if the optic nerve is not involved in the disease; if there be no evidence of any internal organ being affected; it is, under these circumstances, advisable to give the patient a chance, by its removal. In many cases where it has been performed early, the operation has succeeded, and the life of the patient has been saved; if the operation be not performed, the tendency of the complaint is to destroy life, and it will go on to its destruction.

SECTION IV. EXTERIPATION OF THE EYE.

Although this operation appears formidable, and is so to the patient, as it is a most painful one, yet it is not difficult of execution. The best mode of performing it is as follows:—The patient is to be placed in the sitting posture, or, at any rate, with the head elevated, and in order to steady the eye, or shift its position, if necessary, pass a needle, armed with a ligature, through the fore part of the globe of the eye, by which means it is easy to steady it, or move it from one side to the other. If the lids are contracted, or the eyeball is exceedingly large, it will be necessary to divide the outer angle, in order to facilitate the operation. An assistant raises the upper lid, and the operator then introduces a double-edged straight knife through the conjunctiva,
and divides the cellular membrane as extensively as he can. He next cuts through the oblique muscles; and having done this, he then divides the recti muscles and the optic nerve; to complete this last step of the operation, a curved knife, adapted for the purpose, is used, and the globe of the eye is thus easily extracted.

It seldom happens that any haemorrhage takes place which may not be stopped by dossils of lint. The lids are to be brought in apposition, a compress of linen is to be applied over the eye; inflammation should be guarded against, and the patient should not be neglected; for although inflammation does not frequently supervene after the operation, yet it sometimes comes on, extends to the membranes of the brain, and proves fatal.

CHAPTER VIII.

ACCIDENTS TO THE EYE.

Having described the various affections of the eye, it remains now to notice certain accidents to which it is liable, such as the introduction of extraneous bodies, and wounds.

SECTION I. REMOVAL OF EXTRANEous BODIES.

It is very common for various minute substances to pass between the eyelids, and to get in contact with the external surface of the globe, or to adhere to the internal surface of the eyelids; in both cases causing great pain and inconvenience by the mechanical friction produced by the various motions of the eye and eyelids. The situation of any extraneous body is immediately perceived, not only by direct sensation, but in consequence of the motion of the lids, which, by passing the part affected, increases the pain, and, if the foreign body be small and moveable,
generally removes it from the surface of the eye, whilst, by its adhesion to the inside of the lid, it becomes a more constant source of irritation. The situation of the offending substance has great influence on the symptoms which follow. When the extraneous body is lodged on that part of the conjunctiva which lines the tarsal cartilages, it is rubbed against the cornea by every motion of the lid; the sensation is acute, and the general inflammation of the conjunctiva, and in succession, of the cornea, is certain, unless the cause be removed. In nine cases out of ten, the foreign body is lodged under the upper eyelid, and the symptoms come on much more rapidly and severely, in consequence of its greater latitude of motion. In order to remove the foreign body, evert the upper eyelid, which may be done in the following manner:—take the ciliary margin of the eyelid between your thumb and finger, draw the eyelid downwards and forwards away from the eye, and with the end of a probe make pressure against the upper part of the lid, then carry the ciliary margin backwards over the end of the probe, in this way the upper eyelid is everted, and the mucous lining exposed; on this surface the extraneous body will generally be found, and may be removed by the point of the probe. If the foreign body be on the lower eyelid, the examination will be attended with little difficulty.

Extraneous bodies sometimes rest on the surface of the cornea, and produce nearly the same inconvenience as if they were attached to the under surface of the upper eyelid, though not quite so great pain. If the impelling force be sufficient to cause the foreign body to adhere to the part against which it strikes, it generally penetrates the conjunctiva, and becomes imbedded in the substance of the cornea. If no assistance be obtained, the results of such a trivial accident may be fatal to the eye. There is never any difficulty in discovering a foreign body implanted in the cornea, and its immediate removal ought to be effected by a cataract needle in the following manner:—get the patient into a good light,
separate the lids with your fingers, and direct the patient to look attentively and steadily at any object before the eye, then, having a clear view of the extraneous body, insert the point of the cataract needle below it and raise it from its situation.

SECTION II. PENETRATING WOUNDS OF THE EYE.

Penetrating wounds of the globe are attended with great risk of serious inflammation. Even in the operation for cataract, where the least possible violence is inflicted, most violent inflammation frequently ensues; it is not surprising, therefore, that wounds, the result of considerable violence with coarse blunt instruments, attended with lacerations and contusions, occasion most serious inflammation of the eye, in many instances attended with destruction of its function. In all these cases strict antiphlogistic treatment, perfect rest to the eye, rest to the body, and low diet, are indispensable; this is the constitutional treatment in all cases of wounds penetrating the cornea or sclerotic. The local treatment will of course vary with the case.

In these cases it sometimes happens that blood is effused into the chambers; the mere presence of blood is in itself of little moment; because it will be absorbed; but its presence in the chambers of the eye, shows that an injury has been offered to the internal part, which is likely to prove serious in other respects. It induces congestion of the retina, and impairs the function of the organ in the same manner as a violent blow on the head will impair the functions of the sensorium: so that a blow on the eye, by producing congestion of the retina, may be the cause of permanent and incurable amaurosis. Blows on the eye frequently also give rise to a separation of the iris from the ciliary ligament, in consequence of which two openings are found capable of transmitting light; the pupil however generally closes from inflammation, while the artificial opening remains. Sometimes, from injuries of the cornea and iris, displacement of the lens takes place.
In such cases it is advisable to enlarge the opening and extract the lens, otherwise it may produce suppuration and inflammation of the eyeball. In some cases the iris protrudes; if it be uninjured, it may sometimes be made to contract by the joint stimuli of light and friction; if this should fail, the protruded portion should be removed by the scissors, so as to offer as little obstacle as possible to cicatization.
SCROFULA.

The appellation "scrofula," at present used by surgeons, is a miserable title for the diseases which it is intended to represent; it is given to a class of diseases springing from debility. If asked what scrofula is, I should say that in its character and origin it is debility; that the disease, as it proceeds, becomes inflammatory; but that it is connected with original weakness, and derives a peculiar character on account of its arising from this source. You will find that scrofulous diseases are inflammatory; that they undergo all the different processes of inflammation, the adhesive and suppurative processes, ulceration and gangrene; but gangrene less frequently than any of the others. These four processes are thus the effect of scrofulous diseases, but you find them all imperfectly performed. The adhesive matter secreted in scrofulous affections, instead of being firm, consists of a curd-like matter, easily broken and very soft, and this is owing to the blood-vessels not entering it. The suppuration is not of the common kind; it contains curd-like matter, and is not truly purulent; ulceration is slow in its progress; granulations are unequal and slow in forming. These processes are the effect of inflammation, but are also connected with debility; each is imperfectly performed. But how does scrofulous differ from common chronic inflammation? In common chronic inflammation there is debility, but it is the result of intemperance, or change of constitution; but in scrofula the weakness exists from birth; it is congenital or original debility. The age at which scrofula manifests itself is during growth; it is extremely rare for it to occur after. But common chronic inflammation, arising from a change of constitution, produced by intemperance or any other cause, occurs after growth has stopped,
and is much more easy of cure than scrofulous inflammation. Scrofulous disease depends on a state of constitution different to that which gives rise to common chronic inflammation. The one is original, the other is produced in after life. The character of a scrofulous child is as follows:—You will find the skin thin if you pinch it, which is quite different to the skin in children who are not scrofulous; in them the skin is solid and dense, and the fibres strong, but in scrofulous children the skin is thin and the vessels may be seen meandering under it; and it is on this account that persons with this disease frequently have a rosy colour, arising from the thinness of the skin, which allows the vessels to be seen under it. The hair is also light coloured. If you observe, in a family of five or six children, one among them who has a delicate thin skin, light hair and complexion, you will find that if they are all exposed to the same causes, they will escape from any scrofulous affection, with the exception of the one stamped by nature, and that this during its growth will be affected by the disease. The hair is also extremely fine, the eye-lashes long, the pupils dilated, and the fingers are what is called clubbed, similar to the fingers in phthisical persons; the fingers are extremely long and thin, but at the extremities are broad and flat. The upper lip is of considerable thickness, and this is a mark of debility. Those who are the subjects of scrofulous diseases, often have follicles on different parts of the body, incrustated with inspissated matter. In persons of a scrofulous nature, the absorbent glands and joints are most frequently attacked. The absorbent glands, for a reason which I shall hereafter give, and the joints from the exercise producing inflammation in the synovial membrane. You know that the absorbent glands of the neck and mesentery are more liable to scrofula than any others. Various other parts of the body are also liable to it; the lungs, the brain not unfrequently, the eyes now and then; the heart, I believe never; I have never seen an instance where it was. The secreting glands are rarely affected by scrofula; at least the liver and kidneys, for the testicle and breast are exceptions. The testicle is now and
then liable to a scrofulous affection, and we occasionally see a scrofulous tumour in the breast. The secreting glands, however, are very rarely subject to this complaint. Scrofula differs in different constitutions; it may be of an indolent or irritable kind; but more frequently of the first than the second. Of this circumstance you may not yet be aware, but in the course of practice you will find that an absorbent gland will enlarge, and continue so for weeks, and often for months, before it suppurates; and on the contrary, that an enlarged gland will be in a most irritable state, and rapidly proceed to a state of suppuration. This last is by far the worst disease of the two; for joint after joint and various parts of the body become inflamed; whilst in indolent habits the complaint is sometimes confined to a particular class of parts, and the rest are excluded. This, however, is a variety.

You will find scrofula considerably influenced by climate, particularly those climates in which the change from cold to heat, and heat to moisture are most frequent; and on this account our own island is favourable to the production of scrofulous disease. The vicissitudes of temperature are so frequent that a man is never clothed so as to meet them, and the body is consequently exposed to these sudden and various changes. We find cold and moist climates giving rise to the occurrence of scrofulous affections, although it is found that those who live in countries where they are exposed to the extremes of heat or cold are not the subjects of scrofula. But this disease is arrested by cold and heat, uncombined with a moist state of the atmosphere, although it previously existed; and persons predisposed to scrofula, may prevent it from occurring by a change to a warm and dry climate. But people from the East or West Indies, who come over to this country, not unfrequently fall a prey to scrofulous disease. Many children born in the East and West Indies, are sent to this country to be educated, and therefore we have an opportunity of seeing the effect of climate on their constitutions; and I can assure you, that it frequently requires the greatest possible care to save them from the danger of scrofulous disease of the joints.
and absorbent glands; and very often, with all your care and attention, they will die of scrofulous disease. Those from the West Indies less frequently die of scrofula than persons from the East Indies; but I have seen some from the South Sea Islands, and most of them have died from scrofulous complaints. From this statement then, you see that children born in warm climates, and subsequently brought to this country to be educated, frequently perish. Although we have proof of some climates predisposing to this complaint, and favouring its production more than others, yet the most striking effects are manifested by the changes of the season, after scrofula has occurred. Thus, for instance, if a child with scrofulous disease be examined in the spring, and it has a gland that is inflamed, the complaint will go on during the spring, till the summer months, when it will be arrested, and the health of the child be improved. In this state it will remain till October and November, and then the child will become worse. By the alteration of scrofulous complaints, from the changes of the seasons, a surgeon often loses credit, though he more frequently gains it; he will lose credit, if called to the child in winter, because then the state of the child's health will be in an improved state, compared to what it has been: which state, however, continues only for a short time, as it becomes worse with the return of spring; the surgeon will gain credit, if called to a child in the spring, because being at that time very unwell, it continues so only till summer, when it rapidly recovers. In summer the symptoms disappear, in autumn they return, and continue till the winter, when they again become suspended. I remember being once called on to subscribe to a charity instituted for the cure of scrofula, and I said that I had no objection to subscribe, if its benefits were to be extended throughout the year; because if its operations were to be extended all the year round, the eyes of the subscribers would be opened to the inefficiency of any charity of the kind. The way also to try the value of nostra, blazoned forth as specifics for the cure of scrofula, is to watch their effects during the whole year, for else you may be deceived;
they may occasionally afford benefit, (which I do not mean to deny,) but as to any specifics for the cure of the complaint, I need not tell you that such do not exist.

Well, such are the effects of climate and the changes of the seasons, on persons born with a debility of constitution, and that debility giving rise to an inflammation of the scrofulous kind.

The next point to be considered is, Whether scrofula is hereditary? That scrofula is an hereditary disease, appears as clear to me as can be, and they who deny it, deny the evidence of their senses. When speaking of hereditary disease, I do not mean to say, that children are born with an enlargement of an absorbent gland, or disease of the joints; but what I state is, that a child will be born with an hereditary disposition to the complaint. Does a child resemble its father or mother? and do we not see parents predisposed to scrofulous disease, having children of constitutions, complexions, &c., as I have described to you, manifesting the signs of scrofulous affections at some period of their life, and this is the consequence of a particular state of constitution, transmitted to them by their parents. Let two scrofulous persons marry, and see the consequence; a great proportion of the children will be born with a scrofulous disposition; with that debility of constitution which gives rise to the production of the disease. I know that children may, with great care, be preserved from attacks of the disease. A man of a gouty habit shall have many children, and I would not say that all should be affected with gout; but will any one say, that the children of such a parent are not more likely to be attacked with this complaint, than the children of persons who never had the complaint? You may prevent scrofula by care, but as to children being originally predisposed to the disease, there cannot be the least doubt, and in such cases the education, and the habits of youth, should be so directed, as to ward off a complaint the effects of which are so frequently fatal. A gentleman whom I knew, and who was often the subject of gout, had three sons: the first child was attacked in early life with the gout; the second indulged in intemperate habits, and had the complaint to a severe
degree; whilst the third, with extreme care and attention, escaped
from it altogether.

The predisposing cause of scrofula is congenital, or original
fault of constitution. The exciting causes are whatever tend to
produce, or rather increase that debility; such as the fever from
diseases of a specific kind, as measles, scarlet-fever, and small-
pox. Scrofulous affections occurring after small-pox, used to be
much more frequent before the introduction of vaccination than
since, and if there were no other advantage attending it than this,
it ought to be regarded as a boon to society. The reasons, you
must be acquainted with, how small-pox disposes to the excitement
of scrofulous inflammation, without my entering into them at pre-
sent.

With respect to the state of body in scrofulous children, the blood
is less firm, the crassamentum loosely formed, and coagulating
weakly; the quantity of serum abundant; and the solids are
feebly formed. When you dissect a scrofulous person, you find
extreme attenuation of the muscles, owing to the fibres being de-
licately formed, the cellular tissue thin, the heart weak, not at all
having the appearance of the healthy organ; you find the arteries
with loose coats, and if you were to inject them, that the injection
would scarcely reach the extremities; nor is this surprising, since
it happens that the vessels often expand, and give way, and also
that there is blood at the extremities of the arteries, owing to the
great weakness of the vessels, that they had not the power of pro-
pelling it into the veins as they usually do. The stomach and in-
testinal canal are thin and pellucid; the absorbent glands are en-
larged, the secretory glands are flaccid, but not diseased, and the
nervous system sometimes exhibits marks of irritation having
existed in it. This is, as far as we are able to detail, the nature
of the disease; we shall now proceed to speak of its treatment.

The principles on which the treatment of scrofula should be
founded are three. 1st. To make better blood. 2nd. To strengthen
the solids. 3rd. To give vigorous action to the circulation.

To one or all of these principles, every mode of treatment
should be referred. The action of the heart and arteries is naturally feeble, the serum of the blood preponderates, whilst the fibrous portion is deficient in quantity; therefore you must make better blood, strengthen the solids, or give a vigorous action to the system. The first object is to make better blood, and without this nothing else will be of avail. I cannot sufficiently deprecate the system of taking vegetable food in scrofulous diseases, and proscribing animal food, which is most nutritious and easy of digestion. Vegetable food is more difficult of digestion than animal food, and many animals who live on it, have more than one stomach to perform the different processes of digestion; some have only one, but then they are abundantly supplied with gastric juice; it is secreted in greater quantities than in man; and nature adds to the digestive powers by setting up another process in the intestines below, where animals have only one stomach. Vegetable food should not be given to children labouring under scrofula, as it leads to an aggravation of the complaint: but meat should be allowed, prepared so that the stimulus of the gastric juice, which is weak, may be able to act on it. The stomach should never be overloaded at a time, because then you impair the powers of digestion. Meat should be taken in small quantities and often, rather than in large quantities and less frequently, for when the stomach is less loaded, digestion goes on much better. Therefore, I advise that they should breakfast between eight and nine, and take an egg or a little meat with their meal. They should have a sandwich about twelve or one o'clock, and meat with their dinner at three. It is right that they should drink with their dinner, although water is a bad beverage; some good beer or a glass of wine should be allowed. This will stimulate the secretion of the gastric juice, and digestion will be more completely performed than if no stimulus at all had been used. It is well known that in these complaints the stomach is not supplied with a sufficient quantity of juice to dissolve the food, therefore you must give some slight stimulus to excite the gastric juice. If you observe the animals around us which live on animal and vegetable food, you find that after meals
they lap some water, and rest. Rest appears to be conducive to the performance of the digestive process. An experiment has been made which confirms this opinion. Two pointers were fed, each with the same quantity of food; the one was immediately put out to hunt, and the other conducted to the kennel, and in two or three hours afterwards both were killed:—the first had not digested the food he had taken, whilst the other had. Animal food should be given in larger quantities to persons with scrofulous disease than to those in a state of health, although the latter do not require the same aid to assist digestion. In scrofulous children, I do not like the stomach to be loaded with milk at breakfast, which considerably impairs the powers of digestion, and therefore I generally order a little meat or an egg as a substitute.

Next in importance to nourishment is exercise. Children with scrofulous affections, or even those predisposed to them, should take a great deal of exercise in the open air; more, however, in the way of play than as a task; and here I must say, that I am anxious that those concerned in the education of youth, particularly female instructors, should be acquainted with what I have said on this important subject. I wish them to know what food and exercise should be allowed to children with a scrofulous taint, and how much the future happiness of those intrusted to their care is dependent on an attention to these particulars. At schools in general too little exercise is taken by the scholars. Boys, however, will have it; but not so with the girls; they are frequently compelled to sit from morning till night engaged in learning music, dancing, geography, French, nay even Italian, and God knows what else, without paying the slightest attention to the preservation of their health, and thus impairing constitutions which might have been rendered strong and robust. It is not my wish to discourage the cultivation of the human mind in any degree, nor even to prevent the fairer sex from attaining those accomplishments which so frequently render it the grace, life, and ornament of society; but I think it the extreme of folly in compelling children to pass hours
over pursuits for which they have no taste, such as making them learn music when they have no ear; while their health is neglected and constitutions are ruined by the confinement to which they are subjected. The mischiefs thus arising from the false system of education at present pursued in this country, so frequently come before my notice, that I wish what I have said to be generally known, in order that future misery may be prevented and the physical education of our youth be better directed. Exercise should not be taken so as to fatigue the body; when children feel themselves weary, they should rest a little till they recover. When the state of the weather prevents them from taking exercise in the open air, they should play in a large airy chamber, and be allowed to dance in the evenings, taking care that the perspiration excited should not be checked by any improper means, as is too often done with thoughtless and giddy children, and by this means they will be brought up with constitutions invigorated so as to ward off the attacks of a disease to which they were pre-disposed. I do not exaggerate when I say that within this last year, I have seen five hundred cases of scrofulous affections; never a day passes over my head without my seeing a case, and frequently three or four. This very day I have seen more, and if asked how many were boys among them, I should answer not one. What is the reason of it?—why, boys will take exercise, and thus are less liable to the complaint; whilst girls are not allowed, and if pre-disposed to it are almost always attacked by it.

The third circumstance to be attended to is air; without good air, all other means are of no use. Moist and cold weather is the worst. Those who live in marshy climates are subject to the worst form of scrofulous complaints. The state of the atmosphere you should choose, is that in which the air is dry and warm; a very bleak wind is not desirable. The sea air is generally preferred, and when the children are near the sea-side, they should be allowed to play on the beach the greater part of the day. It is a mistake to suppose that the air of the coast in the wet and cold seasons is
of any advantage to scrofulous children; it is only in warm and dry weather, that any benefit will be obtained. Extreme cold suppresses the progress of scrofulous complaints, but in moist weather the symptoms return. Unfortunately I have experienced in my own family the dreadful ravages of this complaint; although no one would say that I was a scrofulous subject. I have lost five near relatives by this complaint from which I have been spared. Whilst at Brighton once on a professional visit, I inquired if the number of scrofulous children was as great there as in other parts, and I found that it was. In the latter part of the spring and autumn, the sea-coast is desirable; but in cold weather it is not. The bleakness of the air of the sea-shore is unfavourable to the constitutions of children tainted with scrofulous complaints. Air, exercise, and nourishment, are the three great points to be kept in view in the treatment of scrofulous affections. But what, you will say,—nothing about medicine? You may lay it down as an axiom, that there is no specific for the cure of scrofula; and he who says that there is, attempts to gull mankind by the assertion of what is not true. Medicines occasionally given with a view to improve the digestive powers and regulate the secretions are good, but attention to the three points I have just mentioned, are of primary importance. I will mention to you what are the best; once a-week, or every ten days, two grains of calomel and eight of rhubarb, in order to restore the secretions. This relieves scrofulous inflammation, on the same principle as all other inflammations are relieved. A good medicine to be given daily for a short time is, the rhubarb and steel—two grains of rhubarb, and from three to five of the carbonate of iron. This is a very good tonic. Another good tonic consists of two grains of rhubarb, and from four to six grains of dried subcarbonate of soda, with ten grains of calumba, which may be taken mixed with sugar, a form that seldom disagrees with the patient. These means will greatly assist the powers of digestion. One of the remedies which we use in the other hospital (Guy’s) is infusion of camomile flowers, with a few grains of hy-
drargyrus cum creta, at bed time. Or the oxymurias hydrargyri, in the proportion of a grain to two ounces of the tincture of bark, a tea-spoonful of which should be taken twice a-day in a glass of the camomile infusion. If the bowels are costive, tincture of rhubarb should be substituted for the tincture of bark. The liquor potassae is a medicine also used. These different medicines medical men use in different ways; those I employ are the steel, with rhubarb and calomel, or the subcarbonate of soda with rhubarb and calumba. A great deal of care should be taken of children originally formed weak; you should excite no feverish action on the one hand, nor do any thing to debilitate the constitution on the other. These are the Scylla and Charybdis, into which we may fall, that of exciting fever on the one hand, and weakness on the other; and recollect, above all, the three principles of treatment which I have so often laid down. Children should be well clothed, and never exposed to changes of temperature. For this purpose, they should wear flannel close to the skin, and in this case it should be worn also during the night. If the weather be very warm, calico may be substituted for flannel. The great object is to preserve an equal temperature of the skin, and not to produce perspiration, because that would debilitate. It is right to recommend sea-bathing, the bath should be taken about three times a-week, at eleven in the morning. The temperature of the bath should be at 94°; the person should remain from sixteen to twenty minutes in it, and walk afterwards. Some children are exceedingly frightened at the sight of the water used in the commencement, and in those cases it will be advantageous to sprinkle the body over first with tepid salt water. This will gradually remove the child’s fear of the water, and prepare the way for the sea-bathing.

Having now given you a general description of scrofula, we shall proceed to treat of the several parts attacked by this disease, and first of the absorbent glands most commonly affected.

Of the different absorbent glands, those of the neck are most frequently affected with scrofulous disease. Now, when you are con-
SCROFULA.

sulted in a case of this kind, the symptoms you find are as follow:—

In the first place, you learn from the child's mother, that she at first observed a swelling in the neck, which was small, hard, not painful, nor in any way discoloured, but tender to the touch. Thus the inflammatory process does not go on to the rapid destruction of the part, for the swelling will frequently remain in this state of indolence during weeks, months, and sometimes years. Sometimes, however, owing to accidental circumstances, or changes in the weather, or the state of the child's constitution, the complaint proceeds with greater rapidity. If the complaint occurs in a person of an irritable habit, it will advance with rapidity; if, on the contrary, the person be of an indolent habit, it will be slow in its progress. When you examine by dissection the state of the parts affected with scrofulous disease, you find extravasated into the gland a great quantity of blood, and the blood-vessels enlarged. The interior of the gland is composed of rather a firm substance, which is of a yellowish-white colour. If you inject the subject first, you will see that the blood-vessels do not pass into the substance effused; in fact, that the adhesive matter is not organized. As the vessels do not shoot into this substance, it does not undergo the same changes as the adhesive matter thrown out in common chronic disease. In common chronic inflammation, the adhesive matter effused may be injected, which shews that it is in some degree organized. Remember, then, that during the adhesive stage, the inflammation may be increased from change of seasons, climate, or any peculiarity of constitution, and proceed to the suppurative. This disease produces little pus. These are the common symptoms of suppuration, but in a much milder degree than are usually met with. The suppurative process is weak and languid, and it is a long time before matter forms. The suppuratation is very imperfect; the pus has not the true character of purulent secretion; it is composed of a curd-like matter, and resembles pus mixed with serum. These, then, are the appearances of the suppurative stage. Suppuration proceeds very
slowly. The skin at first has a blush of inflammation on it, then becomes of a livid or purple hue. It frequently happens that, when the skin is in this state, a long time elapses before it gives way. When the skin, however, breaks, it generally separates to a considerable extent. The reason why scars in the neck are so large is, that the vitality of a large portion of the skin has been destroyed from the pressure of the pus; it then assumes a livid appearance, and when it gives way, sloughs to a considerable extent. The ulcerative process proceeds slowly, compared with ulceration in other complaints. The interior of a suppurative gland very rarely sloughs, but the matter that is effused separates with the pus. Such is the history of an enlarged absorbent gland affected with scrofulous disease, the various changes which it undergoes, and the appearances which those changes present in their different stages.

Death is sometimes produced by enlargement of the absorbent glands of the neck. I will relate to you three instances which more particularly strike my mind. In one case the glands covered the jugular vein. I attended the case with a respectable practitioner in the city. The patient had frequent rigors, and a great deal of constitutional irritation at the time I saw him; his life was evidently in imminent danger, and in a few days after he died. We found on dissection that the absorbent glands were adhering to the jugular vein, and that the matter had escaped into it, which was the cause of the great constitutional irritation under which he laboured a short time previous to his death. The second way in which an enlargement of the glands of the neck may give rise to death, is by pressure on the veins producing apoplexy. I saw a case of this kind in a lad of 16 or 17 years of age. The glands were enlarged so as to press on the veins of the neck, and the boy died apoplectic. The third case which I shall mention, is one where an enlarged gland suppurated into the larynx, and produced suffocation. It occurred in a boy who had received an injury of the head, which was followed by enlargement of the absorbent
glands of the neck. They went into a suppurative state, and the pus discharged itself into the trachea, and produced death by suffocation. But it generally happens that when these cases terminate fatally, there also is present considerable disease of the lungs and bronchial glands.

If I were asked why the absorbent glands of the neck are more frequently affected with scrofulous disease than the other glands, I should answer, that it was owing to their being so much exposed, and consequently so much influenced by the changes of weather and seasons. A child exposed to the cold with the ears half frozen, the cheeks and head also cold, is suddenly brought into a state of excessive heat, which produces a slight degree of inflammation in the parts; that irritation also produces inflammation of the absorbents; and thus the reason why the glands of the neck are so frequently enlarged. Scrofulous enlargement of glands of the neck, is more frequent than of those in the axilla; and enlargement of those in the axilla, more common than of the glands of the groin; because the lower parts are better protected from the atmospheric changes. But it sometimes happens that a peculiar secretion takes place in the gland, and that earthy matter is effused in it. It is not at all an uncommon occurrence for a substance like chalk, and composed of carbonate of lime, to be deposited in an enlarged gland. These deposits are usually composed of carbonate of lime.

When a child with a scrofulous enlargement of an absorbent gland of the neck is brought to you for advice, you will treat it, if the complaint be of recent occurrence, like a case of common inflammation. We may give rhubarb and calomel internally, and evaporating lotions, for local applications. The best lotion you can use, is the liquor plumbi superacetatis with spirits of wine and water. In this way the inflammation will be gradually subdued. But these glands are apt sometimes, notwithstanding all the means you employ, and all the care that may be taken of the child, to go into the suppurative stage. In this case you must
give the rhubarb and carbonate of soda, twice a-day, together with a small quantity of the hydrargyrus cum cretâ (one grain) three or four times in the twenty-four hours. You must next consider what local treatment to employ if the gland suppurates. When you find that there is a disposition to supurate, evaporating lotions will not succeed, and therefore must be discontinued. You should feel if there be any fluctuation; for the moment that there is the slightest blush on the part and sense of fluctuation, indicating the presence of pus, you should make a small opening with a lancet, as in a common abscess; you should not wait for the skin to assume a livid hue, for then you will never be able to prevent scars. A scar in the neck of a boy is not of much consequence, but in the neck of a female, it is quite a different case. In boys, the neck is covered by the dress; whereas in females, it is generally exposed, and a scar in that part might be the means of destroying the happiness of the individual whose misfortune it was to have it. Nothing is so revolting to the mind, or at least the minds of those who possess fine feelings, and a refined taste, as the appearance of any thing on the female figure which calls to the recollection, that the person you behold is tainted by a disease of a scrofulous nature; and therefore it is your duty, if you have any regard for your own reputation and the happiness of others, to prevent the occurrence of scars on the neck, a circumstance which may be easily effected. The reason why scars on the neck are so frequently met with is this; the surgeon waits, too often, till the skin has become livid, and then makes a puncture. But in this case, he gains nothing by making an opening into the gland; in fact, if the skin be of a livid colour, I advise not to make an opening. Apply poultices, and let nature effect the opening; for the scar will not be so great then as if you were to make it. But I seriously advise you to make a puncture before the skin assumes the appearance I have just been describing to you. The instrument with which I open these abscesses is a catarract knife, and I make the incision trans-
versely, and just in the direction of the creases of the neck, so that when the wound heals, no scar is to be perceived. When the matter is discharged by the puncture, apply your finger to the side of the swelling and squeeze out all the solid matter that may be contained in the gland. If the sac be not carefully emptied of all the solid matter, this substance will keep up considerable irritation and prevent the healing of the wound, therefore I wish to press on your attention the necessity of attending to this point. I have frequently seen serious inconvenience occasioned by its being neglected. Remember first, the time at which you are to make the puncture, and the direction in which it is to be made; and secondly do not omit in all these cases to squeeze out all the solid matter that may be within the gland. If the wound be indolent afterwards, you had better inject into it a solution of sulphate of zinc, containing about a scruple of the zinc to a pint of water. Throw a small quantity of this into the wound, it will soon produce healthy granulations, and lessen the discharge if it be copious. Such, then, is the treatment to be adopted after the gland has proceeded to the suppurative state. What I advise you to do, is to make an opening into the gland as soon as fluctuation can be detected, and before any discoloration of the skin takes place; in order to prevent a scar hereafter. Thus you see by a little attention the cause of much unhappiness may be kept off. At this time you should give rhubarb and carbonate of iron, about two grains of the former, and five of the latter, twice a-day. The diet should be nutritious, but not in the slightest degree stimulating. With respect to the ulcerative process, there is nothing particular to remark; fomentations, poultices, and the ordinary means must be had recourse to. Your object, however, should be to prevent ulceration by the mode of treatment I have laid down, and it is only when it cannot be prevented that these means are to be employed.

The glands which are affected with scrofulous disease next in frequency to those of the neck, are the mesenteric glands. In young persons, they are most commonly affected at the age of six
or eight months. This complaint is known by the belly being tumid, and from the tenderness on pressure; attenuation of the skin, voraciousness of appetite; the limbs of the child at the same time wasting. The intestines are equally irregular, being sometimes purged, at others costive. In the motions are occasionally observed earthy matter. The limbs of the child at the same time wasting. The intestines are equally irregular, being sometimes purged, at others costive. In the motions are occasionally observed earthy matter. The causes which produce enlargement of the mesenteric glands arise from disease of the secreting glands of the intestinal canal, such as irritating food; which irritates the mouths of the absorbent vessels of the intestines leading to the mesentery. With respect to the effects of mesenteric diseases, they consist at first in an interruption of the process of absorption. The chyle travels through the absorbents to the mesenteric glands, and when some of these are enlarged, the chyle is interrupted in its course. Although the child generally eats so voraciously, is it wonderful that there should be such emaciation independent of the irritation produced by the system being deprived of nourishment?

As to the treatment, I advise you to direct that the child should take animal food, prepared so that it may be easily digested. Vegetable food is very improper. A little arrow-root may be taken, and nutritious broths. Animal food will generally best agree with the child, if it be prepared in the manner by which it may be most easily digested. The principle on which you act is, that the child may take the most nutritious food. And why? Because absorption being to a great degree prevented, it is important that nothing but highly nutritious food should be taken, so that nutriment may be conveyed to the system. Animal food is more nutritious than vegetable food, therefore you give it in preference to the last. To assist the digestive process, it is desirable to give some wine and water, to stimulate the stomach to secrete the gastric juice, and to excite the action of the intestines; in exciting the intestines, you have a two-fold object in view: stimulating the absorbents, and producing the peristaltic motion of the intestines. The best medicines in this disease with which I am acquainted, is the oxymuriate of mercury given in
small doses, and in combination with the tincture of bark. One grain of the oxymuriate in two ounces of tincture of bark, or should the bowels be costive, in the same quantity of tincture of rhubarb. The hydrargyrus cum creta and rhubarb, given so as to produce an aperient effect, are good medicines. The oxymuriate of mercury should be given with no other view than to improve the secretion from the liver and intestines, and thus produce one stool a-day. The abdomen should be covered with a stimulating plaster, or frequently rubbed with the hand, in order to produce a gentle action in the part, and excite the absorbents. This is the treatment of enlarged mesenteric glands.

Dropsy is sometimes connected with this disease. Then paracentesis should be performed; when the patient generally recovers. Now and then a mesenteric gland suppurates, opens at the navel, and frequently communicates with the intestines, and thus an artificial anus is produced. In these cases, where there is an artificial anus, a large proportion recovers. Poultices should be applied over the opening; and when the inflammation is subdued, strips of adhesive plaster should be applied, so as to bring the edges of the wound together, but not until you think that all the matter has been discharged from the gland.

The diseases of joints vary in their character, according to the stage of the complaint. It generally happens that after a child of a strumous habit has walked a considerable distance, that it complains of pain in the joints, which is accompanied with stiffness of the joint, and inability to move it. The parent takes alarm; and I may say that this disease can never be too early attended to. The complaint may generally be removed, if it be attacked early, but if six weeks or two months elapse before the person applies, he will never recover. A great deal, therefore, depends, in this complaint, on early treatment. To prevent mischief is infinitely better than to effect a cure; and in these complaints a cure is not so easily effected. There is little tenderness at first, and the swelling is very slight. If the synovial membrane be inflamed, there will be a gritting between the bones under the patella on each
side, and so in different parts according to the joints affected. The joint will remain in this state for some time, possess the same appearance as in health, and the constitution suffer little. But where it has existed a long time, the suppurative process will at last be set up, and the joints will assume the character common to inflammation of all joints. When the suppurative process commences, a great quantity of pus is secreted, if there be much constitutional irritation. Indeed there may be at first a copious secretion and slight constitutional derangement; for the suppurative process is not attended with the same constitutional effects as in other parts of the body. When the abscess breaks, (which is a long time from the commencement of the disease,) the ulceration is often at a little distance from the joint, and there are generally sinuses extending from the point of ulceration for two or three inches up to the joint, and thus in scrofulous enlargements of the knee, the abscess generally breaks above or below the patella. We generally let these abscesses open by themselves, as there is little constitutional irritation at first, and the opening cannot be delayed too long. The abscess generally opens in more parts than one, and the suppurative process takes place at a distance from the joint; the ulcerative process is slow, and excites little constitutional irritation. When you dissect a joint affected with scrofulous disease, you find, after having cut through the integuments, that there is a great deal of adeps between the ligaments and interstices of the skin. Next you will see the capsular ligament thickened, and that the thickening has taken place on its interior surface. The synovial membrane will be also found highly vascular. You now examine the cartilages, when you will find that they have undergone more or less ulceration, and covered by processes of adhesive matter; and, lastly, the bones themselves will now and then be in a state of ulceration; sometimes there are earthy deposits on them; but they are more frequently lessened in size. With respect to the nature of the complaint, I believe that it is the result of exercise, which has produced inflammation of the internal lining of the joints, and frequently the synovial membrane. The action of the
joints leads to the inflammation; for you find that a child after walking,—for taken as it frequently is to a distance from its place of residence, the parent forgetting that it has to make two or three steps to her one, and its attention being kept up by the prospect of amusement,—I say, that in these case you will find the child on the following day complaining of pain in the joints. A medical man is consulted, who finds swelling and signs of inflammation of the joint; inflammation of the synovial membrane comes on, which leads to the absorption of the cartilages, and sometimes bone; for my own part, I believe that it is the internal lining of the joints originally affected.

Mr. Brodie, whom I am proud to call my friend, has written a work on diseases of the joints, which cannot be too carefully perused by those who wish to become acquainted with these affections; and he is more disposed than I am to think that the disease commences in the cartilages. I am of opinion that the synovial membrane is at first attacked, and then that the complaint gradually extends to the other parts. It, however, matters little, for the same treatment is to be pursued, whether the disease originates in the cartilage or the internal lining of the joint.

The treatment required in these complaints is as follows: the great object is to preserve the limb in a state of rest. This is so obviously necessary for an inflamed part, that every man will see the reasons for attending to it. If I had inflammation of the hand, should I expect that inflammation would cease unless I kept my limb quiet and in a state of rest? and is it not equally absurd to imagine that an inflammation of the joint will be subdued, unless that joint be kept in a state of perfect rest? I will not say that the body should always be kept at rest, but only the limb affected. This may be often secured, so that it shall remain quiet, although the body is in exercise. Next in importance to rest is the reducing the heat of the part. Evaporating lotions of water and spirits of wine, or the liquor plumbi superacetatis dilutus, with spirits of wine and water, should be employed. Rhubarb and the submuriature of mercury ought to be given once a-day or every second day.
Suppose, however, that the disease advances, and is not subdued, it will be necessary to employ some local counter irritation. Blisters, tartar emetic ointment, vinegar poultices, issues, and setons, are the various means used for this purpose. If the joint suppurates, it will be best not to apply issues or setons close to the joint. Mr. Cline tried once to investigate this point, and the result of his observation was, that if setons and blisters were employed, they should be employed at some little distance from the joint. Blisters may be applied over the joint, but they should not be so large as to produce considerable irritation; they should be kept open by the unguentum sabinae. Depend on it, this is the best treatment; the tartar emetic ointment is a useful irritant, in the proportion of a dram of the tartarized antimony to an ounce of spermaceti ointment. When the irritation has, by evaporating lotions, and other means, been lessened, no motion being at all employed, it will be necessary to put a splint under the limb, extending from the ham to the heel, and then to use friction, so that the joint may in time be restored to use. If no friction or passive motion be employed, there will be no use of the limb any more. This was the great advantage of the late Mr. Grosvenor's plan, of Oxford. I will not say that friction, when the inflammation is going on, is not injudicious, but I mean that if the inflammation be subdued, you are not to leave the joint in a state of rest, but to use friction. Let me put you on your guard, with respect to cases of common inflammation; in them you may employ motion earlier than in scrofulous disease; there is such a disposition to a return of these last affections, that you should never give any pain in the motion you use; the exercise should be so employed, as not to excite the least uneasiness in taking it.

The next circumstance to be considered is, when does amputation become necessary? Formerly limbs used to be amputated for scrofulous affections much more frequently than at the present day, and the reason of it is, that the affected limb may, with care and management, be often made more useful than an artificial one. In enlargements of the knee and ankle, it may be necessary now
and then to amputate, but it ought never to be done unless the patient is labouring under great constitutional irritation, which threatens destruction to his life, or the limb has undergone such changes, that it is not likely to be useful hereafter. For instance, in cases of scrofulous affections of the ankle joint, the foot often remains extended, and the patient is only able to walk on the toes. Here an artificial foot would be much better than the natural one. In scrofulous diseases of the knee-joint, the tibia is often dislocated forwards. There was a case, lately, of this description; the deformity will always remain, and the limb be of little use. Amputation of the fingers and wrist is occasionally performed; that of the elbow very rarely.

I shall now proceed to speak of diseases of the hip-joint, psoas and lumbar abscesses, and vertebral diseases.

Diseases of the hip-joint are more liable to be mistaken than scrofulous diseases of any other part of the body; much error prevails with respect to them. The first circumstance which indicates disease of the hip-joint, is some degree of lameness, and pain in the knee. The motions of the joint are impeded; extension is performed with difficulty; the child's knee is bent, and the heel on the diseased side scarcely rests upon the ground. Besides this incapacity for extension, great difficulty is experienced in the flexion of the joint. Thus, if you attempt to bend the knee towards the abdomen, the child shrinks from the touch and complains of pain. If you throw something on the floor, and desire the child to pick it up, you will observe that in attempting to get possession of it, the child bends only the sound knee. If you say, “Let me see you put your foot on the chair,” the child does this readily enough with the sound leg, but is incapable of doing it with the other, in consequence of the confined state of the flexion of the joint. The rotation of the joint is also impeded; more especially the rotation inwards, which cannot be attempted without great pain and uneasiness. There is apparently a difference in the length of the limb; the unsound limb at first appears longer than the other. It is possible that an effusion into
the head of the joint may push down the limb a little, but I doubt whether this has any influence in producing an elongated appearance of the limb. The length of the limb is not really increased, but an appearance of elongation is produced by the parietes being depressed on the diseased side; if you draw a line from the spinous process of the ilium, from one side to the other, you will find the difference of an inch. After a short time, indeed, a considerable reduction takes place in the length of the limb, the reason for which you will immediately see.

When you endeavour to ascertain whether disease of the hip-joint exists or not, you should first place the patient on his back, and examine whether the sides of the pelvis are equal; the pelvis will be lower on the diseased side. Having placed the patient in the recumbent posture, you will then bend the knee towards the abdomen, which, if there be disease of the hip-joint, will occasion considerable pain. In rotating the joint, also, much pain will be excited in consequence of its stiffened state. You will then turn the patient on his face, and observe whether the nates are lower on one side than on the other; there is generally a difference of an inch or more on the diseased side. These are the common characters of this disease. On dissection you find the following circumstances: in the first place, a quantity of adhesive matter is poured out about the joint; the ligaments are much thickened; the synovial surface is inflamed, and often slightly ulcerated; the cartilages of the joint are ulcerated; and, lastly, the bone itself is sometimes absorbed, not only the head of the bone, which enters the acetabulum, but the acetabulum itself. You will find examples of all these appearances in the preparations in the hospital; there is one in which the head of the bone has been absorbed from ulceration, and another in which the cavity of the acetabulum has undergone a remarkable alteration, the upper part of it having been absorbed. Abscesses are frequently formed in diseases of the hip-joint, which take different directions; in general their course is down the thigh, between the trochanters and the outer surface of the thigh, where they break. Sometimes
they occur in the upper part of the thigh; there is an example in the collection, in which an abscess occurred in the direction of the femoral artery, and, by its pressure, occasioned the absorption of a considerable portion of the vessel itself. Sometimes the abscess breaks into the rectum; there is an example of this in a preparation in the hospital, where you will perceive the rectum very considerably enlarged at the place into which the abscess has broken. Abscesses sometimes take their course into the vagina, from whence the matter is discharged; an instance of this kind occurred recently in a child of eleven years of age; it will be right, therefore, to mention to the friends of the patient that there is great variety as to the course which abscesses take in this disease.

The cause of this disease is in general too much exertion; too long a walk, for instance, for the strength of the patient, which produces inflammation of the synovial surface.

With respect to the treatment of this disease, you will observe, during the inflammatory stages, the same plan which I have recommended to you in the treatment of scrofulous complaints. It may be observed, generally, that if you do not cure a case of diseased hip-joint in a few weeks, from six to ten weeks for instance, you will not succeed at all. In the first place, the recumbent posture, and as much rest as possible, should be strictly enjoined. If there is much pain, leeches should be applied; evaporating lotions should also be employed in the first few days. If you do not find the inflammation yield in a few days, it will be right to put a large blister over the part, and to keep it open with the Unguentum sabinæ for a considerable length of time. The surface kept open with the savine ointment, should not exceed the size of a crown piece, as you might otherwise produce too much irritation, and do more harm than good. Issues and setons are more applied here than in other diseases of the joints. It is better to regulate the degree of irritation in this way, than to endeavour to produce effects by violent means, which, by exciting fever, might only be adding fuel to the flame. With respect to the
treatment of abscesses, it is right in all diseases of joints, and especially in diseases of the hip-joint, to postpone the opening of them as long as you can; unless the abscess is exceedingly large, it is best not to open it at all. The reason for this is, that if you open the abscess early, you expose the cavity of the joint to irritation; whereas, if you delay the opening of it, you suffer the abscess to make its passage to a considerable distance from the joint, so that the opening of it will not be liable to excite much irritation in the cavity of the joint. The irritation will be very slight if you delay the opening; but if you make it early, the effect will be just the same as if you were to make an incision into the joint. Give time for nature to perform her task, and to fill the joint itself with adhesive matter, as the abscess extends down the limb to a great distance from the joint. I have made up my mind most decidedly on this point, having again and again had an opportunity of contrasting both modes of practice. When the disease is protracted, it would be cruel and injurious to the child to keep it in a state of perfect rest, and it should therefore be allowed to use a crutch. This will prevent the derangement of the general health, and that depression of mind which arises from long confinement. If the disease has continued for any length of time, it is not to be expected but that some lameness will remain.

A disease similar to the disease in the joints occasionally occurs in the spine, sometimes beginning in the vertebral substance, sometimes in the bone itself. The disease of the vertebral substance has been accurately described by Mr. Pott, and I recommend you to consult his pamphlet, which contains a very admirable history of this disease. It is manifested in the following manner. The child complains of a fixed pain in the spine; the pain, however, is not confined to the spine, but it extends down on each side, in the direction of the nerves arising from the spinal marrow. There are weakness and pain in the back; pain on the sides, more on one side than on the other; and the nerves arising from the spinal marrow are inflamed in consequence of
the pressure of the membrane of the spinal marrow. After a little time, there is a projection of the spine backwards, one, two or three of the spinous processes projecting more than the others. It usually happens that the lower extremities become affected; sensibility is diminished, and the muscles lose a portion of their voluntary power. Thus, a child affected with this disease is in the constant habit of falling, in consequence of a want of due power in the muscles. There is this difference between paralysis and the effect on the lower extremities from this disease, that in the former case all action of the muscles is suspended; in the latter there is diminished power and spasmodic contraction of the muscles. The patient sits with his limbs drawn under him, and his heels towards the nates; and there are besides, spasmodic twitchings of the limbs. If the lumbar or dorsal vertebrae be affected, there will be difficulty in discharging the urine, and the faeces will at length pass off involuntarily. When the disease is in the neck, the head is the only part of the body, except the vital organs, which retains its power; volition is lost in all the parts of the body below the seat of the disease, and the patient is reduced to the most abject state of helplessness. This disease of the spine is very apt to produce abscesses, in the form of psoas and lumbar abscesses. These abscesses frequently occasion a very considerable loss of substance, as may be seen by the preparation in the hospital. On dissection, the vertebrae are found to be sometimes wholly, and sometimes in part absorbed; occasionally, four, five or more vertebrae are absorbed; there is a specimen in the College, in which four vertebrae are wholly, and two are partially absorbed. This absorption is the effect of pressure on the spinal canal. A curious change takes place, after a time, in the spinal canal, which is, that instead of being smaller, it is larger opposite the part in which the vertebrae have given way. In cases where a cure has been effected, the spinal canal is larger opposite the part where the vertebrae have been absorbed, than it is above or below the diseased part. The mode in which the disease becomes cured, is by the upper portions of the vertebrae falling on the lower, and
in this way ankylosing. This is not matter of conjecture; we have three specimens in the museum, by which you will see the upper part of the spine bent forwards, so as to meet the lower vertebrae, and in this way producing ankylosis. This must be your object in the treatment of this disease. You should keep the spine of the child as much as possible at rest; with this view, the child should be kept as steadily as possible in the recumbent posture, so that the vertebrae may be suffered to fall into contact, and by coalescing effect ankylosis. If you attempt to keep the spine straight, you will defeat the object of nature; do not keep the patient in a directly straight line, but rather assist nature in producing the union of the vertebrae. Great attention should be paid to the general health of the child; it should have the best of nourishment, taking care to avoid any thing which may produce feverish excitement; likewise airings in a carriage, care being taken that the body should not be shaken. If the child cannot be kept at rest, if the parents are unable, or refuse to observe these instructions, the next best treatment will be to apply one of Callow's backs, which is worn upon the spine, and fixed round the pelvis and shoulders. As to avoiding deformity, that is out of the question; in all these cases deformity is inevitable; whatever you do, this cannot be prevented. The words which now fall from my lips you may recollect at some future period, when you may be called to a case of this kind; and I now tell you, that I have never met with an example in which the spine, under these circumstances, has been exactly restored to its natural state. All that you can do is to assist, or rather not to oppose the process of nature in producing ankylosis. Blisters, setons, and issues are commonly employed, but they frequently do more harm than good, by the irritation which they excite in the constitution; the means on which you should chiefly rely are rest and the recumbent posture. The part of the spine affected is of no importance with respect to the cure; whether it be the neck, back, or loins, there will be no difference as to the treatment, except in the form of the mechanical means which may be employed.
The next diseases to which I shall call your attention, are psoas and lumbar abscesses.

With respect to these diseases, I shall point out to you the nature of their treatment very shortly. Disease of the ligaments of the spine commences between the ligaments and the surface of the intervertebral substance. It is very often nothing more than an abscess, from the disease which I have just spoken of, having its origin in inflammation of the spine, and the intervertebral substance. The matter spreads till it reaches the origin of the psoas muscle, which passes into ulceration, and forms a bag, surrounded by a complete ring. The abscess proceeds as far as the tendon of the muscle, by Poupart's ligament, and its further progress is restrained by the tendon; when it passes under Poupart's ligament, between the femoral vein and the symphysis pubis, it has generally attained considerable magnitude, and has the appearance of femoral hernia. You may know this abscess by the following marks: in the first place, when you ask the patient whether he has for a long time had continued pains in the loins; if he has psoas abscess, he will reply, "Yes, four, five, or six months;" you will find that he has a difficulty in extending the thigh; if he puts his legs together, he feels pain and tightness in the groin, and he has increased pain in attempting to exert the limb, in consequence of the psoas muscle being then on the stretch. An excellent case of psoas abscess, in which the symptoms were particularly well marked, occurred in St. Thomas's Hospital a few days ago. This disease has the same seat as femoral hernia, and is therefore liable to be confounded with it: the marks which chiefly distinguish it from femoral hernia are the pain in the loins, and the great constitutional disturbance which the patient suffers in the progress of the disease. If the abscess forms on the side of the vertebrae, instead of the fore part, it is termed lumbar abscess, instead of psoas.

So much for the nature of psoas and lumbar abscess: with respect to the treatment, you must allow the abscess to take

**Treatment.**
its course; very little can be done in this disease, until it has acquired considerable magnitude. The use of issues is sometimes recommended in these cases. Little can be done, however, to prevent its progress when it is once formed, and I do not know that any advantage is to be derived from counter-irritation. Digitalis has been given, with a view of promoting absorption, but I have not known it in any instance succeed. Mr. Cline, senior, once gave it, to a very considerable extent, to a boy fourteen or fifteen years old; the abscess diminished for a little time, but when the digitalis was given up, in consequence of its influence on the general health, the disease returned. Let the abscess proceed, until you observe a redness or blush of the skin, and then adopt Mr. Abernethy's plan of making a valvular opening into the part, so as to discharge the matter, and close the orifice almost immediately. The danger does not arise from the quantity of matter accumulated, but from the irritation produced by the attempts of nature to close the abscess, and fill the cavity by the process of adhesion. Four days after the abscess is opened, violent symptoms of constitutional irritation are apt to come on, such as great depression of strength, loss of appetite; and the patient is soon reduced to the lowest extremity. It is extremely desirable to prevent the occurrence of these symptoms; and the plan of Mr. Abernethy is the best that has ever been suggested by any surgeon, with a view of preventing them.—You are to make the opening obliquely, apply a bandage which is fastened round the abdomen, and endeavour to bring the sides of the abscess as close together as possible, in order to promote the process of adhesion. If ulceration should take place, the matter will be in this way discharged, and all you can do is to support the efforts of nature. I have frequently seen patients recover from this disease. I advise you to use all the means which I recommended in the treatment of scrofula, for the purpose of improving the general health of the patient. A considerable degree of rest should be enjoined; all exercise is injurious in this disease.—Blisters are sometimes placed
on the spine, and issues opposite the seat of the disease, but I am not sure that external irritation is of any considerable advantage. I have, however, seen benefit from injecting the abscess; the injection usually employed is the sulphate of zinc, or alumen. It promotes the adhesive process in the interior of the abscess, glues its sides together, and lessens the purulent secretion.

Here I shall conclude with a few observations on the disease produced by debility of the vascular system, which is commonly called rickets. It first manifests itself in disease of the mesenteric glands; the abdomen is increased in size, the head is considerably enlarged, and out of proportion to the rest of the body, so that the disease is often mistaken for hydrocephalus. This arises from the softened state of the bones, which are incapable of supporting the action of the arteries in the brain, and the head and forehead are consequently expanded. The chin is expanded, the sides of the jaw are brought together, and the whole of the features are altered, so that in general, by merely looking at the face of a patient, you may infer from it the state of the spine, and other parts of the body. An alteration takes place in the form of the spine, which has a double curvature, above and below, like the Italic S. Nature endeavours still to preserve the perpendicular line of the body, by producing a second curvature as soon as one begins, and the equilibrium is maintained, though there is a considerable variation in the form of the spine. The scapula is also considerably projected; a parent will come to you, and say, "I am very uneasy about my child's shoulder—it is growing out." You will judge from this alteration in the shoulder, that there is some alteration in the form of the spine and ribs. Pressure on the shoulder, therefore, with a view of remedying this defect, is a most absurd and unscientific practice; it may give pain, but can do no possible good. The spine in these cases has given way in two directions, and the ribs on one side are more curved than on the other. This incurvation of the ribs occasions the alteration in the form of the scapula. The anterior part of the chest is extremely projected; the sternum is sometimes

P P 2
sunk in between the cartilages of the ribs, and sometimes advances so as to form what is called a chicken breast.

The bones of the extremities also undergo an additional curvature.

When you feel the os humeri of a child under this disease, it seems as if it had had a fall, and the bone had been fractured; the ossific matter is absorbed, and nothing but the cartilage remains. The same appearance is frequently observed in the femur and knee-joints.

When this disease has continued for any length of time, absorption of some of the bones takes place, and nothing but the cartilage remains; such are the miserable changes to which rickety children are subject.

The cause of all these changes is a great deficiency in the powers of the circulation, in consequence of which, the bones lose their phosphate of lime, and become spongy at the extremities, and the joints, therefore, are exceedingly enlarged. The ossific matter binds down the cartilages, so as to prevent their expansion, hence arises a diminution of the ossific deposit, which leads to the alteration in the form of the bones.

With respect to the treatment of these cases, you will observe the same general principles which I laid down for scrofula, and you will also resort to mechanical means.

If the head be enlarged, you must direct your mechanical means to reduce it.

For the enlargement of the head, it will be right to use some sort of pressure; a cap or roller round the head may be worn, for the purpose of preventing the growth of the head, by the pressure of the arteries of the brain.

Another point of treatment will be to prevent the curvature of the spine.

For this purpose, it has been the practice to keep children in the recumbent posture for a great length of time. This is a plan which I by no means advise; exercise should be freely allowed, taking care only that it be not protracted so as to occasion fatigue. At the same time exercise is taken, you must preserve the spine
in a straight position, by giving artificial support. This may be
effected by two springs of steel, added to the stays, one on each
side of the spine, which may be worn by the patient in any po-
sition. Callow's back is a good mechanical contrivance: it fits to
the back of the patient, and is passed round the pelvis, without
pressing on the sides; the pressure is on the crista of the ilium,
and not on the sides.

In the use of mechanical means, the great object should be, not
to force the child into a constrained position, but merely to pre-
vent inclination to one side or the other.

No medicine is known, that possesses any direct efficacy in this
complaint.

Tonics are indicated and should be employed. Bark, quinine,
and steel should be employed. In particular, the functions of the
bowels should be properly regulated by medicine. But more
good is generally effected by keeping children in healthy situa-
tions, and in a salubrious air, than by any medicine whatever.
Light, wholesome, nutritious, easily digestible food; cold bath-
ing; regular gentle exercise, or carriage airings, &c., are also
serviceable.

*Mollities ossium* is an affection of which we know very little.
There appears to be a defect in the assimilating powers of the
system, whereby the proper portion of phosphate of lime is not
deposited; whereas in rickets there is an excess of cartilaginous
material. What is often called mollities ossium is only rickets,
and should be treated accordingly.

Many very rickety and deformed infants improve as they grow
up, and acquire strength.

The deformity of their limbs spontaneously diminishes, and the
bones gain a proper degree of firmness, a due quantity of phos-
phate of lime being deposited in their texture.

Fothergill highly extols hemlock, and next to iodine and
rhubarb with soda and calumba, it is often efficacious. It ap-
ppears, however, most suitable for dispersing indolent scrofulous
ulcers.
Nitrous acid is recommended by some writers; e. g. Burns.

Of all medicine, however, iodine is that which has, of late years, engaged most attention, and considerable confidence is placed in it by some of the best practitioners, both as an internal and external remedy. The use of burnt sponge in scrofula and bronchocele appears first to have suggested the employment of iodine. Dr. Coindet, of Geneva, originally called the attention of the profession to the value of this remedy in bronchocele, and subsequently Manson, Gairdner, Baron, and others added their testimony to its equally important influence in scrofulous affections generally. By some it has been described as almost a specific in this complaint, but its peculiar effects appear to depend on its stimulating the capillary circulation throughout the system, and increasing the activity of the absorbents.

The use of iodine requires caution, as ill effects have arisen in some instances, such as pains in the stomach, chest, bowels, palpitations, tremors, &c.; when any of which occur, it is scarcely necessary to observe, the medicine must immediately be discontinued. It is expedient always to begin with very small doses, carefully guarding against stimulating the system violently, which only aggravates the complaint. Scrofula is eminently a chronic affection, and can only be successfully attacked by lenient means, perseveringly employed and judiciously administered.

The usual effect of iodine is a slight action on the bowels and an increase of urine, but it should not be permitted to cause emaciation. It is best administered with a salt or alkali that renders it soluble, taking care that such are used as do not cause it to be decomposed. The tincture is not so suitable as some other preparations. The iodide of potassium (more generally known as the hydriodate of potash) is, perhaps, most frequently employed. The dose is from one grain, gradually increased to two or more, thrice a day; it is always given in solution, as in the following form:

*R.* Iodide of potassium . . . . 3 grains.
Distilled water . . . . . 8 ounces.
To be given in divided doses. Coindet adds a grain or two of iodine to this solution, with a little syrup. The decoction of sarsaparilla may be used instead of distilled water.*

The tincture is made by dissolving forty-eight grains of pure iodine in an ounce of alcohol. The dose for adults is from five to twenty drops three times a day.

Lugol employs iodine in baths, containing about two grains of iodine in each pint of water.

The iodide of iron, first brought into notice by Dr. A. T. Thomson; appears a very eligible mode of exhibiting iodine, especially in those cases when the system requires tone. Two or three grains taken in distilled water two or three times a day.

Lugol recommends iodine in the form of *ioduretted mineral* Lugol's formulae.

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<td>R. Iodinii</td>
<td>gr. ½</td>
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<td>Potass. Hydriod</td>
<td>gr. j½</td>
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These are administered progressively, beginning with No. 1, of which 3vj. are to be given in the course of the day for the first few days, afterwards increased to 3viij. After fifteen days, No. 2 is given daily, in divided doses, and in the fourth week, No. 3. They are to be sweetened at the moment of administration.

The external employment of iodine is of equal importance with its internal employment. The simple ointment of hydriodate of potass is recommended by Magendie.

- Hydriod. Potass. . . . 1 drachm.
- Lard . . . . . . 1½ ounces.

This ointment is to be rubbed into scrofulous tumours night and morning, commencing with about half a drachm.

A small portion of pure iodine may be added to the above,

* The *Liquor Potassii Iodidi Comp.*, Pharm. Lond., is also a good formula in doses of two or three drachms per diem; and may be used as a lotion for scrofulous ulcers, &c.
thus forming the Ung. Iodinii Comp. of the London Pharmacopeia. The Ung. Hydrargyri Biniodidi and Iodidi are also useful applications to indolent scrofulous ulcers.

Affinity of scrofula and phthisis now well ascertained; its characteristic element being a deposit of unhealthy lymph, in fact, *tubercle*. (See Carswell).

Scrofulous diathesis exasperates almost every morbid affection with which it comes in contact.

The composition of the fluids in scrofulous subjects evidently defective; generally containing an inordinate proportion of phosphate and carbonate of lime and chloruret of soda. (Labillardièrè; experiment.)

Dr. Cumins' advice. (Cooper's Dict., p. 1157).

Regimen; diet; clothing; exercise; climate. (Sir J. Clarke).

Sea-bathing highly beneficial; cold sea-bathing eminently so. (Russell, Cullen, Lloyd.)

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**PATHOLOGY AND DISEASES OF BONES.**

As a living texture, that of the bones is subject to many of the diseases which affect other parts endued with vitality, and in which the functions of circulation, innervation, absorption, and nutrition are continually going on. Thus it is liable to atrophy, hypertrophy, inflammation, suppuration, a change resembling ulceration, and another like mortification of other parts. The nerves, it is said, have never been demonstrated in the osseous
texture; yet, if it be the seat of pain, our judgment must infer the existence of what may not be discernible by the eye. M. Sanson very aptly compares the organization of bone to something between that of an organic and that of an inorganic body, its vitality being necessarily obscure, and correspondent to its constituent elements. The organic actions seem, indeed, to be carried on in it, with greater difficulty, the more the earthy matter in it predominales over the animal part. Thus, in children, irritation, inflammation, and every action in the osseous texture are quicker than in old persons; because the bones in early life contain a greater proportion of animal matter than at a later period, when the phosphate of lime is more abundant. However, even in children, and still more conspicuously in adults and old persons, the diseases of the bones are generally marked by a slowness of character which has attracted the notice of all pathologists. Many weeks are required for the completion of a provisional callus, and nearly twelve months for that of a definite one; while a few days, and often a few hours, will suffice for the union of the wound of the soft parts. In consequence also of the inferior, or inconsiderable connection of the bones with the nervous system, they frequently appear to inflame and undergo disease, without involving the rest of the system in any sympathetic disturbance, till the irritation is propagated to the surrounding parts, or suppuration comes on. As M. Sanson observes, a necessary consequence of these facts is, that therapeutic means, even those of the most energetic kind, frequently have but little power over affections of the osseous tissue; and, if they prove effectual, it is not till after a long perseverance with them.

ON SUPPURATION IN BONE.

Abscesses are found sometimes between the periosteum and surface of the bone, at other times within its cancellated structure, and occasionally, but very rarely, between the lamina forming the shell of the bone.
When forming between the periosteum and surface of the bone, it possesses the common characters of the formation of matter; there is severe pain extending along the surface of the bone; this pain, though severe, is of an obtuse kind; it becomes worse at night, and produces an inequality on the surface of the bone. It is a long time, however, before the periosteum ulcerates, the skin presents a circumscribed blush; you may even feel a fluctuation for a long period before the abscess breaks. The matter is to be evacuated as soon as the redness and fluctuation are distinct, then place the periosteum as closely on the bone as you can, leaving a small opening for the discharge of the matter, and apply, at the same time, straps of adhesive plaster round the opening, to keep the periosteum in contact with the bone, and the probability is that the parts will unite by adhesion. But if the opening made by nature, or by the surgeon, be large, the bone is deprived of its supply of blood, the part exfoliates, and granulations afterwards shoot out.

The treatment to be further pursued is this: if the bone be much exposed and die, touch it with an acid that will decompose the phosphate of lime, and the cartilaginous part also, and for this purpose the lotion of muriatic acid, made in the proportion of gr. ij. to 3iv. of water, or the lotion of nitric acid, gr. ij. to 3j., will be found the most useful. I think, however, that the diluted nitric acid is the best; it induces a healthy state of the bone and of the other parts, and it is the application which I generally prefer. Sometimes acetic acid is used for this purpose.

When the granulations arise from either the medullary membrane or from the periosteum on the surface of the bone, cartilage is first deposited, and afterwards phosphate of lime.

When an abscess forms in the cancellated structure, a peculiar process takes place. The result of the pressure of the abscess is to cause an absorption of the cancellated structure, and in this way the space for the increase of the abscess continues to be enlarged. At the time that there is an inflammatory action going
on in the medullary membrane, there is a corresponding degree of inflammation going on in the periosteum, which causes a bony crust to be deposited on the surface, which materially increases the size and strength of the bone. But upon that part of the bone least covered by skin and muscles there is an ulcerative process going on, which overcomes the deposit from the periosteum, and thus the matter is evacuated. In this way it often happens that there is little of the original bone left, but the weight of the body is principally supported by the new shell of bone which is formed. But if the constitution be so enfeebled that it cannot deposit a sufficient quantity of bony matter externally, whilst the process of absorption is going on within, then the coats of the bone become so thin, that the bone either breaks or cannot support the superincumbent pressure.

The best treatment to pursue in this stage of the disease is, to inject the interior of the bone with the muriatic or nitric acid lotions, (the latter is preferable,) and at the same time insist on the observance of rest. Support the strength of the constitution, and avoid all those causes which would produce irritation, either generally or locally.

Abscesses in the shell of the bone require to be treated in the same way, and their process of restoration occurs rather quicker than when the abscess is seated more internally.

The portions of bone thus deprived of their vitality must separate, and this exfoliation of bone is either external or internal. When the periosteum is separated to any extent from the surface of the bone, if it be immediately replaced, it will again unite, and no exfoliation will ensue. But if it be allowed to remain detached from the surface of the bone for twenty-four hours, it will not reunite, the bone dies, and is ultimately separated. The dead portion of bone appears at first white, but it soon becomes black from the hepatized ammonia formed during the putrefactive process.

The separation of the dead from the living portion of the bone is a tedious process, and is effected by the action of the ab-
sorbents on the surfaces of the living bone, removing that part which is in absolute contact with the dead bone; a space is thus formed into which granulations can rise. When these granulations reach the dead bone, they also act on it, and therefore you find the surface rough and uneven which is in contact with them, whereas the external surface remains perfectly smooth.

The principles which are to guide you in the treatment are these:—quicken the progress of the granulations a little, and act chemically on the parts by the acids, and that acid which I have before named is the best. The quickest exfoliation of the tibia which I have ever known was accomplished in three months. Most generally, however, twelve months are necessary for this purpose, and it will very often require two years. But this depends very much on the activity of the constitution.

It is right, if we wish to diminish the size of the exfoliation, to bind it upon the granulations, which will absorb a part of it; according to experiments made by Sir William Blizard on this subject.

Internal exfoliation is also a very singular process. A man who is losing two-thirds of his tibia is walking about during the period in which it is separating. This process I have already described to you, when speaking of medullary abscess. In the treatment of this disease, I should say that much might be done to assist the efforts of nature. As soon as the bones become loosened, which you may easily know by passing a probe into the wound, what I should advise you to do is this: take away a portion of the new bone, so as to admit of your sawing the old bone into two portions, and then draw them out. After amputation in full health, there is often necrosis taking place on the end of the bone forming the stump. It happens because the bone is exceedingly loaded with phosphate of lime at the time of the operation; but if a man be previously reduced by disease, a thin shell of bone only remains, and the blood-vessels have a much more free action on the bone.

Exostosis is of two kinds, cartilaginous and fungous. The
cartilaginous contains only a very small quantity of the phosphate of lime, and grows originally from the inner surface of the periosteum, and spiculae of bone afterwards shoot into it. The fungous exostosis is rather a nest of bone enveloping the fungus than constituting the fungus itself. It grows from the medullary membrane. In the treatment of the fungous exostosis nothing can be done but to palliate; the growth will proceed in spite of local and constitutional remedies. Where the exostosis is cartilaginous, growing from the periosteum, they cease to increase beyond a certain extent, and usually form at the insertion of tendons into bone, as at the insertion of the triceps abductor magnus. You should make an incision through the integuments, cut through the muscle in the direction of its fibres, and having reached the top of the exostosis, you find the knife easily sinks into it from its being still partly cartilaginous. Then slit down the muscle on each side, and apply the circular saw invented by Mr. Machim, which is worked by a winch in the handle. When the exostosis arises from the cancellated structure of the flat bones, an idea suggested itself to me that it might be removed in the following way; by making an incision through the periosteum covering the tumour, and then separate it further with the handle of the knife on each side, the exostosis is gradually discharged by a suppurative process. But do not attempt this where the exostosis is excessively large; but it may be done with safety if it be not more than three or four inches in circumference.

**Excision of Bones.**

This operation is sometimes applicable to the articular portions of bones, but still more frequently to other parts of them. The circumstances under which it is practised for the removal of diseased or very severely injured joints, and the plans then to be adopted, will be hereafter considered. Neither shall I dwell at present upon the removal of the projecting ends of broken or dislocated bones; nor upon sawing off the extremities of old ununited
fractures; subjects noticed in the account of dislocation and fracture. Towards the conclusion of the observations upon Dislocation, some account has already been given of the excision of certain bones of the hand and foot.*

It is difficult, as M. Malgaigne observes, to lay down any precise directions for the excision of the bones of the tarsus. The following plan was adopted by Moreau, the father, for an extensive caries:—Over the cuboid bone, there was one ulcer an inch in diameter; and another between the third and fourth metatarsal bones, resulting from an incision made a few days previously for the discharge of an abscess. A probe penetrated into the cuboid bone. An incision was made along the outer side of the foot, and extended across the ulcer, from the posterior third of the fifth metatarsal bone to above the anterior tuberosity of the os calcis; and, as the incision already made for the abscess could now be made serviceable, this and the other incision were conjoined by a transverse one, and the square flaps reflected. The diseased bones were thus brought into view, and it was necessary to remove the cuboid, the third cuneiform, the posterior end of the fourth metatarsal bone, the inner side of the extremity of the fifth, and the articular surface, by which the os calcis is united to the cuboid bone. The tendon of the peroneus longus was preserved. The flaps were then laid down, and united with two sutures. The patient, who was young, got completely well. The vacancies occasioned by the extrication of the bones were filled up by a substance which afterwards ossified. In the end, the patient was able to walk well; the foot having assumed its natural shape and motions. The operation of removing the metacarpal bone of the thumb, or the metatarsal bone of the great toe, is not deemed by Mr. Liston an advisable proceeding; because the rest of the thumb or toe is left without support, and is useless. He has seen cases treated in this way; but the result was unsatisfactory. However, Monro removed the whole of the first

* Vol. II. page 395.
metatarsal bone on account of caries, and M. Barbier did the same thing at the Val de Grâce, after a dislocation of the bone; and in each case the result was in every respect successful.

The extraction of the metacarpal bone of the thumb has been performed with success by M. Roux and M. Blandin. The thumb was at first shortened and useless; but gradually became capable of executing all its natural movements. An incision is to be made along the radial edge of the bone, and to extend about half an inch beyond each of its articulations. Then the integuments and extensor tendon are to be detached from its dorsal, and afterwards the muscles from its palmar surface. While an assistant holds aside the lips of the wound, the surgeon opens the outer side of the carpal joint with the point of the knife, cuts through the tendon of the long abductor, which is inserted into the metacarpal bone, and then carries the knife completely through the joint. He now tries to dislocate the bone outwards, and to pass the knife along its inner side, so as to effect its total detachment from the muscles. Lastly, the articulation with the first phalanx is opened by cutting in succession the internal and external lateral, and the anterior, ligaments. The radial artery may be avoided; but, were it wounded, the application of a ligature to it would be attended with no difficulty. The wound is to be brought together, and the thumb supported in its natural position with soft pads placed in the palm. Excision of the anterior portion of the first metatarsal bone, seems to M. Blandin advantageous, because, when the rest of it can be saved, the foot remains with a more solid support. A flap is formed at the inner side of the bone, with the base backward. The bone is exposed to the point where it is intended to divide it; sawn perpendicularly to its axis; then detached from its connections, from behind forwards; and finally disarticulated from the phalanx. With respect to the phalanges of the other four toes, amputation is commonly preferred to excision of them; and so it is to excision of the heads of their metatarsal bones. Although the excision of the metacarpal bone of the index and little fingers may easily be performed by cutting along the outer margin of it,
M. Malgaigne is probably correct in stating, that such an operation, in consequence of the subsequent shortening of the finger, would leave after it as much deformity as amputation would produce, and even greater weakness of the hand. This observation is not applicable, however, to the excision of the metacarpal bones of the middle and ring fingers, which will still retain their connection with the contiguous ones, and the strength of the hand be preserved. An incision is made along the dorsal aspect of the bone, by the side of the extensor tendon, which should not on any account be divided, and the disarticulation is to be begun at the knuckle. The removal of dead, or softened and carious portions of the carpal and tarsal bones, Mr. Liston admits, is sometimes successful; but, operative interference with these, or with more extensive and formidable articulations, is not advisable, unless the soft parts be not largely involved, and the general health tolerably good. If the ligaments, bursæ, and cellular tissue are much affected, Mr. Liston considers the chance of the discharge ceasing, and of the return of health, entirely hopeless. Amputation above the diseased parts will still be indispensable; and, in consequence of the more reduced and deranged state of the constitution, this second operation is less likely to answer than if it had been undertaken earlier. It is right to mention, however, that after necrosis of the first phalanx of the thumb, and the extraction of the fragments, M. Velpeau has known the part regain its motion. If an incision were necessary for the removal of this phalanx, it should be made along the radial side of the thumb, and the metacarpal articulation, which is the looser one, being opened first, the phalanx should then be luxated outwards, and dissected out. In a few cases, Mr. Liston has removed several of the tarsal and carpal bones; as practised by Mr. Dunn of Scarborough, in others, one, or a portion of one, with success. In one instance, the greater part of the astragalus was taken away along with the ends of the tibia and fibula. There remained a large opening across the joint, through which a seton was passed to promote the gradual and piecemeal discharge of the remaining portions of diseased
THE PATHOLOGY AND DISEASES OF BONES.

bone. The articulation could be seen through. The seton was gradually diminished, and the aperture closed. The foot was preserved, and the leg was somewhat shortened; but the limb proved extremely useful, though the ankle retained little power of motion. Mr. Liston, as well as many other surgeons, has also trephined the os calcis, and removed large portions of it. He has likewise taken away the cuboid bone, along with the bone of the metatarsal bone or bones, in connexion with it. In some of these cases an excellent cure followed; in others, amputation of the foot was afterwards necessary. Examples of the removal of extensive portions of the os calcis are reported by Hey, Moreau, and M. Roux. In the North London Hospital, there was a young woman, in 1835, from the outer part of whose os calcis Mr. Liston removed a considerable piece with a trephine. The case was a scrofulous caries. Some amendment followed; but the caries penetrated too far to admit of complete removal in this manner. A fine specimen of the same thing was lately put into my hands by Mr. Morton, of University College, the part having been finally amputated in the Newcastle Hospital. In one case, where the scaphoid bone of the carpus was dislocated by an injury, occasioned by machinery, Sir Astley Cooper successfully removed that bone. The rule proposed by him for any analogous case, is to take away one, or even two, of the carpal bones, if displaced; but, if the mischief is greater, to amputate.

I am not disposed to bestow much commendation on such an operation as the excision of the ribs, notwithstanding the high and respectable authorities which may be quoted in sanction of it, with the exception of its performance in cases where a sequestrum is nearly or entirely loose. The most remarkable excision of the ribs yet recorded is that performed by Mr. Richerand in 1818, on a medical officer, who was afflicted with cancer of the thorax. The middle portion of four ribs was removed to the extent of several inches. It was also necessary to extirpate the contiguous part of the pleura, which was very much thickened, and transformed into a cancerous substance. Thus, the pulsations of the
heart, within the pericardium, were brought completely into view. The case afterwards went on favourably for a time; but in the end proved fatal by a return of the cancerous disease. I scarcely need advise British surgeons not to attempt any similar operation, where the disease of a rib, or indeed of any other bone, is the effect of a primary cancerous affection of the soft parts. Such an experiment must inevitably terminate in the return of the original malignant disease, unless the patient's accelerated death happen not to leave sufficient time for this result. These observations are directed chiefly, however, to the particular case here specified; for, as the excision of portions of ribs has been performed by several eminent surgeons with success, I conclude that circumstances may occur in which the plan is justifiable. Not to lay any stress upon the instances of the practice in ancient times by Galen, Aymond, Sediller, Lecat, Ferrand, &c., it has been twice resorted to subsequently to Richerand's operation, and with success, by Attadini in Italy; also in the Hospitals Beaujou and La Charité at Paris; and by Dr. Mott, of New York. The operation consists in extending the incision through the soft parts beyond the extent of the diseased portion of the rib, both in front and behind, and then, after detaching the bone from the pleura at the point where it is intended to divide it first, it may be sawn through with one of Hey's saws, or, what will be more convenient, divided with a pair of cutting pliers. The divided end of the bone should then be inclined outwards, and separated from its connexions, so as to facilitate the safe division of it beyond the opposite extremity of the disease. A principal thing in the operation is to avoid injury of the pleura as much as possible.

In 1825, the excision of the radius was accomplished with complete success by Dr. R. Butt, of Virginia; and in 1826, M. Velpeau had a case in which he was desirous of practising a similar operation, on account of disease entirely restricted to that bone; but the patient preferred amputation. An incision is made along the outer and anterior part of the radius. The edges of the wound are to be held apart, and the muscles detached from its anterior and posterior
surfaces, a little below its middle part, where it is most superficial; a chain saw is to be used; a director now being introduced at the ulnar side of the bone, will serve to convey the chain saw behind it. In the place specified the bone is sawn through, and the two fragments carefully dissected out. If sufficient room were not obtained for the action of the saw by the longitudinal incision, a transverse one should also be made. A strong pair of cutting forceps would divide the radius with less difficulty than a chain saw.

In an example of necrosis of the outer third of the clavicle, M. Velpeau removed the scapular portion of it. Two incisions, in a crucial form, and four inches long, were made, the flaps raised, the acromio-clavicular ligaments, and some parts of the origin of the deltoid and trapezius divided. The bone was then raised with a lever passed into the joint, and its detachment completed. M. Malgaigne conceives, that a better plan would be to make first an incision, parallel to the clavicle, but a few lines below it, and ending at the acromion, and then another shorter one at a right angle with this extremity of the first, so as to form a triangular flap. Instead of a chain saw, the clavicle may be very safely divided with one of Hey’s saws, or a pair of cutting pliers, care being taken to pass a flexible copper spatula under the part.

The sternal end of the clavicle was removed many years ago by Mr. Davies, a surgeon of Bungay, in Suffolk, on account of its being displaced backwards, and dangerously compressing the oesophagus; in consequence of the scapula being forced very much forwards by a deformity of the spine. In this operation a piece of leather was placed under the bone to protect the subjacent parts from the saw. The interclavicular ligament was torn through, so as to free the sternal end. The patient was alive six years after the operation, and in good health.

The whole clavicle, affected with osteo-sarcoma, was removed by Dr. Mott, of New York. The tumour was of the size of two fists, and reached upwards nearly to the hyoid bone, and angle of the jaw. A semilunar incision, with its convexity downwards, was made below the swelling, from one end of the bone to the
other. Another incision was next made above the tumour from
the acromion to the external margin of the internal jugular vein.
The platysma and a portion of the trapezius having been divided,
a director was passed under the bone, near the acromion, and a
division here effected with a chain saw. Not being yet able, how-
ever, to displace the tumour, Dr. Mott, with the aid of a director,
extended the first incision inwards; and, having applied two liga-
tures to the external jugular vein, and cut it through in the inter-
space, he next divided the clavicular portion of the sterno-mastoid
muscle, and found it necessary also to tie and divide the internal
jugular vein. The subclavian vein and thoracic duct were sepa-
rated from the diseased parts with the handle of the scalpel. Lastly,
the great pectoral muscle, the costo-clavicular ligament, and the
subclavian muscle having been divided, the disarticulation of the
sternal end of the clavicle was accomplished. The bleeding re-
quired forty ligatures for its suppression. In six weeks the wound
was nearly healed, and the patient afterwards, with the aid of a
mechanical substitute for the clavicle, retained the power of moving
the limb, with but little impairment.

The excision of the scapula, to a greater or lesser extent, has
been performed on several occasions. In one instance a consider-
able portion of the scapula was removed by M. Janson, on account
of a tumour involving it. Two semi-elliptical incisions were
made, so as to circumscribe the swelling; as much skin as possible
was dissected up and saved: the tumour and bone were then det-
tached from their connexions in every direction, as low down as
the fossa subscapularis. The attachments of the trapezius, supra
and infra spinatus having been divided, and the portion of the
bone above the spine ascertained to be sound, all the other dis-
eased part was sawn off, and the shoulder joint left uninjured.
One more incision was necessary to expose the whole of the tu-
mour, and facilitate its excision. The wound was altogether six
inches in breadth, and nine in length. The motion of the shoulder
was preserved. A large tumour of the scapula was removed two
or three years ago by Mr. Earle; but, as the disease returned, Mr.
Skey removed it a second time, together with the greater part of the scapula. The disease, however, being of a malignant character, again returned and proved fatal. Several cases of this description have been lately met with in the hospitals of this metropolis. One was in the North London Hospital under Mr. Liston. I heard of another in the Westminster Hospital.

Excision of the whole of the fibula, with the exception of its head, was performed by M. Scutin. The particulars are contained in M. Malgaigne's Manual. Many arteries require ligature, and amongst them the posterior tibial. The external popliteal nerve was also divided. As the tibia was slightly affected, the cautery was applied to it. In two months the wound was healed, and, in four, the patient could bear nearly as well on this leg as on the other.

In the articles Amputation and Gunshot Wounds, I have noticed the excision of the upper head of the humerus; and in that on Ankylosis*, some account is given of Barton's excision of the head and neck of the femur; an operation, to which an allusion is made in the writings of C. White, of Manchester, and which has been performed by Sir Benjamin Brodie, Mr. Anthony White, and in Germany by Oppenheim. Sir Benjamin Brodie lately informed me that his patient died some time afterwards of phthisis. I believe the case was one in which it was suspected that the disease was restricted to the head of the femur. My friend Mr. Anthony White has favoured me with the following particulars of the case in which he performed the operation:—John West, a twin of delicate make, was born and resided in Westminster. When between four and five years old, he suffered from scrofulous inflammation in the left hip joint, which passed through the stages of elongation, dislocation, and subsequent retraction, and the femur was finally lodged in a very high position, on the dorsum of the ilium. "About three years subsequent to the commencement of the disease, and when he was about eight years old, I first saw him. He

* Cooper's Dictionary.
was much emaciated; several abscesses had formed during this period around and over the diseased structures, leaving many fistulous openings, through which the probe easily detected the surface of the displaced bone to be in a state of caries, and several small exfoliations had occurred, from the ilium, ischium, and os pubis, over which bones abscesses had formed. In the progress of the disease the knee of the affected limb had become inverted and firmly imbedded on the lower and inner part of the opposite thigh, from which position it could not be removed, and every attempt to do so was accompanied with exquisite pain. All further attempts, therefore, were abandoned, and the limb left undisturbed. He had now lain nearly three years, on the opposite side, with the body considerably incurvated, and without the power of changing his position. A profuse and debilitating discharge was constantly issuing from the numerous apertures leading to the carious surface of the displaced bone. In other respects, the health of the boy was tolerably good. Reflecting on this poor boy's case, it was evident that, unless the knee could be removed from its firm lodgment on the opposite thigh, he must remain in the position above described during the remainder of his life, and this could only be effected by removing the upper portion of the femur, which, from its trifling mobility, induced the belief that a firm union was taking place between its under surface and that of the ilium, with which it had been long in contact, and the form of which was very apparent under the thin integuments with which it was covered. Considering, also, that as an entire destruction of every texture which forms a healthy joint had taken place, no danger could be reasonably entertained from meddling with parts in their existing condition, and attempting the removal of the head of the displaced bone; and, further, that the strength of the boy, from the profuse discharge kept up by the caries of the bone was never likely to be restored: I was induced, after mature reflection, to propose an operation for the removal of the upper part of the femur as far as it should be found in a state of caries, which, from examination with the probe, appeared to extend pro-
bably a little lower than the great trochanter. If this could be accomplished, it would set free the lower portion of the bone imbedded on the opposite thigh, and enable me to draw outwards the whole limb, and possibly place the boy in a condition equally favourable with those cases where a similar disease had occurred, and in which a compensatory joint is formed, on which locomotion is effected with or without the aid of a crutch. I proposed to divide the integuments covering the bone, beginning above its head, which was easily detected, and carry it downward, in the centre, as low as might be found necessary, and separate the soft parts from the shaft of the bone towards either side. I then proposed to divide the bone at the lowest exposed part with a small saw and to elevate it with a lever from the dorsum of the ilium. I hoped that the wound would heal over the divided end of the bone, which (now being set free) might be brought into a straight line, and which motion would incline deeply into the wound the end of the divided bone. The wound itself was to be treated as a common incision with adhesive plaster and bandage, and rigid quietude. My colleague, the late Mr. Morel, saw the case, concurred in the proposition, and offered to be my assistant. The late Mr. William Smith, member for Norwich, and to whom the mother of the boy was well known, informed the late Sir E. Home of the proposed operation. The boy, at his request, was conveyed to St. George's Hospital; and, after an examination of the case with his colleagues, a written document, signed by him and them, was given to the mother of the boy, declaring that the contemplated operation would not only be useless, but impracticable; and, most likely, if attempted, be attended with loss of life. I was not present at this consultation, and only knew of it by being shown this document or protest by the boy's mother. Of course, with such a published declaration, I abandoned the case altogether. After the lapse of some months, Mr. Travers, whilst attending at Mr. Smith's house in the city, to which the boy West had been removed with his mother, was requested to look at him; and being told of the proposed operation by the mother, who was an
exceedingly intelligent person, at once saw and understood the principles and plan of the proposition. He subsequently wrote me a note, expressing his entire concurrence in the measure, and kindly offered to assist me in the operation, notwithstanding the formidable protest which had been issued shortly before. Glad of the concurrence of so distinguished an individual, and my own opinion as to its practicability being unchanged, I gladly accepted of the offer. A lodging, in Westminster, was procured for the boy and his mother. We met in consultation, and an early day was fixed for the operation.

"In April, 1821, we met; and the boy being placed on a table of convenient height, I proceeded to divide the integuments covering the bone, carrying the incision from an inch above the head, directly along the middle line of the bone, about two inches below the greater trochanter: this was completed at one incision down to the surface of the bone. The integuments were dissected inwards and outwards, thus leaving the bone entirely bare, a little lower down than the lesser trochanter, which was distinctly visible. A spatula was now placed under that part of the bone which was intended to be sawn through, so as to protect the structures underneath. This was readily accomplished. A smaller spatula was then introduced into the space made by the saw, and used as a lever to raise the bone; which, with a little dissection, was removed from the dorsum of the ilium. No vestige of the acetabulum remained, neither was any caries of the ilium discovered. The thigh was now readily brought into a straight line, and the knee liberated from its position on the thigh. The wound was closed by adhesive plaster, and no portion of the bone was left exposed. Splints and an eighteen-tailed bandage were applied, and the limb placed in the straight position. The boy bore the operation well, and not more than two ounces of blood were lost. The head, neck, and trochanters, were very apparent, the caries being superficial, and not extending lower than the lesser one. The case proceeded very favourably, and in a few weeks every sinuous opening had healed, and also the incision made in the in-
teguments. The patient rapidly acquired strength and flesh. At the end of two months, I began to examine the parts to ascertain if they had formed any attachment to the surrounding structures; and, on attempting to move the limb in different directions, I discovered that the boy himself had the power of raising the thigh upwards, which power gradually increased, and, finally, a very extensive motion was accomplished by the spontaneous action of the muscles. I now proceeded to examine whether he could bear pressure upon this foot without inconvenience, which was the case, at the expiration of about four months from the time of the operation. He was put on crutches, and in a very short time could bear considerable pressure on the foot, and, at the end of a year, he could walk on a high stirrup without his crutches. Finally, it was clearly ascertained, that a new and useful joint had been formed, the boy being enabled to walk several miles without the aid of a crutch or stick. He acquired great latitude of motion, except in rotating the thigh outwards, and separating the thigh laterally outwards. He was apprenticed to a lady's shoemaker, and, five years after the operation, he became phthisical, and died of diseased lungs in the Westminster Hospital. The limb was removed with half the pelvis, and is in the possession of the Royal College of Surgeons; but the parts have not yet been examined, in order to ascertain the changes which had so usefully been employed in giving almost a perfect joint as a compensation for the original. The shaft of the femur appeared to have lost the power of further elongation; for, on frequent admeasurement during the life of the patient, it was discovered not to have increased in length. Probably the fact is not generally known, that bones do not increase in length after the amputation of their heads."

**EXCISION OF THE SUPERIOR MAXILLARY BONE.**

In the article Antrum*, certain states of disease of this cavity are noticed, in which the only chance of cure depends upon the

* Cooper's Dictionary.
entire removal of the upper jaw-bone itself. I allude to osteosarcomatous, fibrous, and other tumours, which originate within the antrum, and by enlargement produce such an impairment of, and pressure upon, the surrounding organs and textures, as must ultimately prove fatal, unless a bold attempt be made to extirpate every part of the osseous texture, serving as a place of attachment to the swelling. Merely excising the alveoli, and front of the antrum, and then attacking the tumour with the knife, cautery, or caustic, generally fails. Baron Dupuytren was led to suspect that, by the excision of the upper jaw-bone, its total extirpation might be performed with a successful result. He was induced to form this opinion from the consideration of the examples on record, where the patients recovered after most severe mechanical injuries of the face, and necrosis, occasioning the destruction of the bone. Camper mentions a case, in which the whole of the bone came away, in consequence of necrosis, and the patient was cured. Acolumbus is stated, indeed, to have actually removed the upper jaw-bone for a tumour of the face, as long ago as 1693. Bidloo and Desault also anticipated Dupuytren in the belief, that the upper jaw-bone might be successfully extirpated, though they never undertook the operation themselves. The bulletins of the Faculty of Medicine at Paris prove that Dupuytren removed, at all events, the greater part of the bone, in 1824; but, as MM. Pillet and Gensoul contend, probably not the whole of it. M. Velpeau states that, in 1824, Mr. Rogers of New York removed both upper jaw-bones, as far back as the pterygoid processes, and this without making scarcely any incision through the lip. In 1826, Mr. Lizars also advocated the removal of the whole of the upper jaw-bone, and he performed the operation with success, in 1827, 1828, and 1830. In May, 1827, M. Gensoul, surgeon to the Hôtel Dieu, at Lyons, removed every part of this bone, together with the whole of the palate bone, on account of a fibro-cartilaginous tumour, and the patient got completely well.

In this work, M. Gensoul states that, several years previously, he had known patients die of very tedious operations, undertaken
for the removal of cancerous and other tumours of the antrum. Reflecting on the fate of these unfortunate individuals, he was led to conclude, that others, labouring under similar disease, might be cured by an operation, which consisted in freely denuding the antrum and upper jaw-bone, so as to be able to divide the sound parts, instead of meddling with the diseased ones, and of searching for the precise limits of the disease in the midst of blood and the remains of the affected textures. In short, he was induced to think, that the same principle should be acted upon in this operation as is followed in others, undertaken for the extirpation of cancerous tumours in general.

If the face of the skeleton be examined, it will be seen that the upper maxillary bone is fixed to the others only at three principal points:—1. By means of its nasal process, and at its connexions with the os unguis and ethmoid bone. 2. By means of the orbitar process of the malar bone, as far as the sphen-o-maxillary fissure. 3. By means of the connexion of the upper jaw-bone to its fellow, and to the palate bone. There is, indeed, a point of contact behind with the pterygoid process and palate bone; but this readily gives way on depressing the upper jaw-bone towards the mouth. In attacking these different points, no large vessel is injured; the trunk of the internal maxillary artery generally escapes, and, if wounded, may be readily tied, as was exemplified in the removal of the whole of the superior maxillary bone, performed by Mr. Liston in the North London Hospital, on the 27th Feb. 1836. If the hemorrhage during the operation were to be greater than calculated upon, the carotid artery might be compressed against the transverse processes of the cervical vertebrae. As for nerves, the only one of consequence necessarily divided is the superior maxillary; but it may be easily cut through before the bone is displaced, and then the laceration of it avoided, if judged advisable. This proceeding is strongly advocated by M. Gensoul; but, in the operations which I have seen performed, no preliminary division of the trunk of this nerve was practised, yet no ill consequences were the result.
The patient should be seated in a chair, with his head inclined backwards, and supported on the breast of an assistant. One of the incisor teeth is to be extracted at the place where the division of the bone is to be effected below. An incision is now to be made from the inner canthus of the eye down to the upper lip, which is to be cut through opposite the canine tooth; and the incision may then be made from a point five or six lines to the outer side of the external angle of the eye, down to the termination of the first. This will leave the parotid duct safe below it. The flap is next to be raised up as far as the lower border of the orbit. This plan is more simple, and less disfiguring, than that of M. Gensoul, who, after the first incision has been made, makes a second from the level of the nostril, to a point about four lines in front of the lobe of the ear; and then a third, extending from a point five or six lines behind the external angular process of the os frontis, down till it meets the termination of the second cut. The quadrilateral flap thus formed is then reflected on the forehead.

M. Velpeau prefers an incision commencing at the commissure of the lips, and carried outwards, and then upwards towards the temporal fossa. This would not, however, expose the bone sufficiently for the section of its nasal process, for which purpose the perpendicular cut, from the inner canthus down to the upper lip, is very necessary. When the tumour is large, the circular sweep of the knife, as advised by M. Velpeau, and long ago practised by surgeons in this country, has advantages. The bone having been denuded, the next step is to divide the connexion of the malar bone with the external angular process of the frontal, and immediately afterwards the zygomatic process of the malar bone. These excisions are best accomplished with Liston's cutting forceps, which should have long powerful handles; a construction found in the North London Hospital to answer better than jointed handled ones, which cannot be opened so wide, and have a tendency to slip off the bone instead of cutting it. The greater power with which they shut does not, there-
fore, seem to Mr. Liston to compensate for the inconvenience referred to. At all events, any additional power required can be obtained by simply lengthening the handles.

The next thing is to divide the nasal process of the superior maxillary bone, and the connexion of the latter bone with the os unguis and os planum. For this purpose, one blade of the forceps is put within the orbit, the other within the nose, and the section accomplished.

This having been effected, and a cut made under the lower part of the palate, the upper jaw bone is divided with the same instrument, at the place where the incisor tooth was extracted, together with the palatine process and palate bone, at the symphysis.

The bone being next pressed downwards, the slight connexion with the pterygoid process, through the medium of the palate bone, gives way, when the upper jaw-bone, including the whole of the antrum and disease originating in it, is easily dissected out. The flap is brought down, and the wounds united with the twisted suture, aided with narrow strips of adhesive plaster. Mr. Liston prefers, as less irritating, strips of oiled silk, smeared with a solution of isinglass and brandy. These strips he does not usually remove till the wound is healed. The straight steel needles which he employs for the twisted suture, and the eye ends of which are tipped with red sealing-wax, and the points cut off with pliers directly after their introduction, are removed within the first forty-eight hours, leaving the many twisted silk to come away as soon as it loosens.

The following is Mr. Liston's description of the operation:—To expose the bone, the cheek is divided from the angle of the mouth to the origin of the masseter; and a second incision made from the inner canthus, to the edge of the upper lip, near the mesial line, detaching the ala of the nose from the maxillary bone. The flap of the cheek, thus formed, is dissected up, and the nasal process of the maxillary bone, and the body of the os malae are divided with a saw, or with strong cutting pliers. An incision
having been made through the covering of the hard palate, near the mesial line, a small convex-edged saw is applied to the bone, and the alveolar process is cut through with the pliers, after extraction of the middle and lateral incisors. The bone is then pulled downwards and forwards, and its remaining adhesions separated by means of the knife or pliers. During the progress of the operation, the cut branches of the facial and temporal arteries are commanded by ligature or pressure, and the violence of the hæmorrhage is moderated by pressure on the carotids. After removal of the bone, the deep vessels, branches of the internal maxillary, are secured either by ligature, or by firm pressure with charpie, or dossils of lint. The facial flap is replaced, brought together over the charpie by which the cavity is filled, and united by interrupted or convoluted suture.

In the examples of this operation which I have seen, any preliminary ligature of the common carotid artery would have been totally unnecessary. In one instance the internal maxillary was cut, but secured with the greatest facility. In a case, operated upon by Mr. Liston in the North London Hospital, not a single ligature was necessary.

It is an important object to prevent, as much as possible, the blood from flowing towards the throat, in the early part of the operation; hence the advantage of the sitting posture, and of Gensoul's plan of beginning with the division of the cheek-bone, or zygoma, before the nasal process of the upper jaw bone itself is attacked.

Excision of lower jaw-bone.

The practicableness of this operation was long ago evident enough from cases in which the greater part of the bone had been torn away by gun-shot injuries, or where it had exfoliated from necrosis. Boyer relates an instance in which it was torn away by machinery; and Wepfer quotes a case where it was amputated in his time. Mr. Anthony White, surgeon to the Westminster Hospital, removed, at Cambridge, a considerable portion of the
bone for an osteo-sarcoma, many years ago. Unfortunately, the case was not published; so that the revival and execution of the operation are generally referred to Dupuytren, who, in 1812, performed his earliest excision of the body of the lower jaw-bone. The parts removed weighed a pound and a half; the bone was affected with exostosis caries and necrosis, softened in several places, and combined with a hard fibrous fungus. The patient recovered, and was in perfect health twenty-one years after the operation.

Subsequently to the year 1812, the operation has been frequently repeated by Dupuytren, Dr. Mott, Richerand, Lallemand, Delpetch, Roux, Cusack, Martin, Gerdy, Magendie, Cloquet, Wardrop, Lisfranc, Warren, Gensoul, Græfe, Walther, Wagner, Randolph, Liston, Lawrence, Ph. Crampton, Velpeau, &c. By M'Clellan, Walter, and Græfe, nearly the whole of the bone has been taken away. By many other operators, disarticulation has been performed at one of the condyles.

The method of performing the operation varies according to the extent of the disease. To expose the tumour, and allow the bone to be readily divided, there must necessarily be a free division of the soft parts. Previously, also, to fixing upon the plan of operation, the extent of the disease must be correctly ascertained. When only the central portion of the body of the bone was to be removed, the following was Dupuytren's plan:—the patient is seated, and his head held steady against the breast of an assistant, who is to stand behind him, and, if necessary, make pressure on the facial arteries. The surgeon, standing in front of the patient and on his right side, is to take hold of the right portion of the lower lip with his left hand, while an assistant takes hold of the left portion. In this way the lip is rendered tense, and separated from the other. With a common scalpel, an incision is then made completely through it, from above downwards to the base of the jaw. The next thing is to extend the wound through the skin and cellular tissue from this point down to the prominence of the os hyoides. Thus, two flaps are produced, each
of which is to be dissected up, as far as the extent of the disease requires, with the knife kept close to the bone, so that the facial arteries may not be wounded. The exact places having been ascertained to which the saw is to be applied, a tooth on each side must be extracted. The operator then taking a fine metacarpal saw, or one of Hey's, goes behind the patient, in which position the saw can be employed without any risk of its extremity being pushed against the palate. If requisite, the nose and upper lip may be protected with a piece of pasteboard. But, according to my observations, the best plan is only to make a groove, or partial division of the bone with the saw, and then to complete the section on each side with the cutting pliers, which expedite the business very considerably, and with no risk of injury to the contiguous parts. The bone having been cut through on each side, the surgeon takes hold of the portion about to be removed with his left hand, and while it is inclined forwards, he introduces a straight bistoury from below upwards, close behind it, and detaches it from the soft parts to the right and left, keeping the edge close to the bone. An assistant takes care to keep the tongue out of the way with a spatula, or the handle of a director. The vessels are now secured, the ends of the bone approximated to one another, and the flaps of skin united with sutures; care being taken to leave a small portion of the wound open below for the insertion of a bit of charpie or lint, and as an outlet for the discharge, in the event of matter being formed.

If the portion of bone to be taken away were so extensive as to require the excision of a part of the integuments, Dupuytren made two incisions, one in each side of the lip, which were extended down, so as to meet at the os hyoides, and form together one in the shape of a V. When the perpendicular cut will not suffice, on account of the extent of the disease, it may be converted into a crucial wound, by making an incision along the base of the jaw.

One danger attending the operation is the retroversion of the tongue into the pharynx, as soon as the attachments of the genio-
The glossi muscles behind the symphysis have been cut. In this state, the tongue presses the epiglottis towards the glottis, and the patient is in imminent peril of suffocation. Indeed, in one case, M. Lallemand would have lost his patient had he not instantly performed tracheotomy. Hence Delpech, before he divided the muscular connexions of the tongue, behind the symphysis, used to seize the extremity with a double tenaculum, which was then entrusted to an assistant; and afterwards, in applying the sutures he passed the thread of one of them through the frænum of the tongue and the skin together; if the interrupted suture were employed, or, supposing the twisted suture to be preferred, the ends of the thread, passed through the frænum, were twisted round the pins. In one case, Delpech introduced a piece of gold wire through the apex of the tongue, and fastened it to the contiguous teeth. The wire soon cut its way out, leaving a sufficient adhesion. In few instances, the circumstances of the disease may be such as to make it necessary to remove only a portion of the depth of the bone.

As the retroversion of the tongue, though not constant, is always a possible event, I concur with Malgaigne in the prudence of attending to the advice delivered on this subject by Delpech, or else of taking care not to cut through the insertions of the genio-glossi muscles, until the possible displacement of the tongue has been guarded against.

In the excision of the whole of the horizontal portion of the lower jaw bone, one plan consists in making an incision along its base, and extending it a line or two beyond its angles. A large flap is then dissected up, and turned over the face. The bone is sawn on each side beyond the limits of the disease, and then detached from the soft parts which are connected with it behind, with the precautions and according to the directions above particularised.

If the disease were to extend high up in the rami, an incision should be made along the posterior edge of each ramus, so as to meet the extremities of the first wound.
Another method, specified by M. Malgaigne, is easier than the foregoing. After the horizontal incision has been made, a perpendicular one is made completely through the lower lip, and carried down in the middle line till it meets the horizontal wound. Both the lateral flaps are then dissected up.

In the excision of one half of the horizontal portion, several methods are adopted. In one, preferred by several British surgeons, and also by J. Cloquet, a horizontal incision is begun at the commissure of the lips, and terminates at the distance of one or two lines beyond the ramus of the jaw. To this first incision are added two vertical ones; one descending from the border of the lip to the base of the bone; the other, taking a parallel course, descends behind the ramus to a point a few lines below the angle. The flap is dissected from above downwards; the soft parts are next detached from the inner surface of the jaw; and, lastly, the bone is sawn through. In the latter proceeding I particularly recommend Hey's saw, or a small metacarpal one, for making a groove in the bone, which can then be divided with the cutting pliers at one stroke, as practised by Mr. Liston, and always demonstrated by me in the Lectures on Operations at the London University.

Mr. Liston has likewise expressed himself, as follows, in favour of one method, in which the flap is made from above downwards:—"The cheek may be divided (says he) by passing through it a long narrow bistoury, close to the anterior edge of the masseter muscle, and carrying the instrument forwards, and through at the angle of the mouth. From each extremity of this incision, another is made downwards; the anterior one inclining forwards, the other backwards. By reflection of the flap thus formed, the bone is exposed more easily, rapidly, and perfectly, than by the former mode of incision, in which the flap is made by a semilunar incision along the base of the jaw."

In the plan adopted by Dr. Mott, of New York, two flaps are formed. A curved incision is made, with its convexity downwards, from a point in front of the ear, and on a level with the
condyle to the vicinity of the chin, below the commissure of the lips. The upper flap is raised and reflected on the face. A second incision, descending from the upper end of the first to the angle of the jaw, enables the surgeon to form a lower flap. The bone is sawn through, first in front, and then behind, as high up as the circumstances of the case require. If above a certain point, Dr. Mott recommends the inferior maxillary nerve to be cut through, before the bone is drawn outwards, and the lingual branch of the fifth pair to be carefully avoided.

A third method, which has the names of Cusack, Lisfranc, Liston, Malgaigne, &c., in its favour, consists in making, first, a vertical incision through the lip down to a point below the chin, and then a horizontal cut, extending from the first along the base of the jaw to two lines beyond its angle. The flap is then dissected off the tumour, in the direction from below upwards, and reflected on the face. The bone is then sawn through in front and behind, and the flap united with sutures. I am of opinion with M. Malgaigne, that this plan is more simple than the others; no lodgment of pus is likely to follow it; and the scar will produce but slight disfigurement. I recommend, however, the front portion of the bone to be divided before the posterior part of it, as facilitating the safe detachment of the mylohyoideus and other parts connected with its inner surface.

One method, described by Mr. Liston, is a modification of the foregoing:—"If the tumour is included between the lateral incisor tooth and last molar, on the same side, these teeth must be extracted to permit division at these points. A semilunar incision may then be made along the base of the jaw, the horns of the incision pointing upwards, and passing over the spaces which were occupied by the extracted teeth. The flap is dissected up, and the membrane of the cheek divided along the line of the incision. The bistoury is then carried along the inside of the bone, so as to divide the membrane of the mouth, and separate the attachments of the muscles. The tongue is pushed aside, and a copper
spatula placed under the jaw at the part to be divided, in order that the soft parts may not be injured during the sawing. A small narrow saw, or one commonly known by the name of Hey's, is applied to the bone at the points where the teeth were extracted; and, by a few motions of this instrument, a notch is made of no great depth; a pair of strong cutting pliers are placed in the track, and by them division of the bone is accomplished with equal neatness, and much more rapidly than if the use of the saw had been continued. The pliers should be strong in every point, and the handles long, to afford the advantage of a powerful lever." The chain-saw, he says, is not to be depended upon, and is slow in its operation.

A fourth plan, described by M. Malgaigne, may be applicable where the disease extends more in the direction backwards than forwards. In such a case, perhaps, it may be sufficient to make a semilunar incision along the posterior border of the ramus and the base of the bone, from the ear to the chin. Thus only one flap would be formed, and no cicatrix would be seen on the face.

M. Malgaigne lays it down as a maxim, that, in making the flaps in any of these operations, the skin and cutaneous muscles alone should be divided, and that the masseter should be cut through, and removed at the same height as the bone itself.

The facial artery is readily secured. All those operators who have had recourse to the ligature of the carotid artery, as a preliminary measure, have subjected their patients to a very needless proceeding.

Even in the excision of one half the lower jaw-bone at its articulation with the temporal bone, the ligature of the carotid artery is quite uncalled for. One plan consists in making an incision along the base of the jaw; a second one is then made perpendicularly through the lower lip down to the first; and a third begins at the zygoma, and extends behind the ramus. The flap is raised, and the fore part of the bone sawn through. The soft
parts are then detached from its inner surface, and the tendinous attachment of the temporal muscle to the coronoid process cut through from within outwards. Lastly, the disarticulation of the condyle is effected: for this purpose, the external lateral ligament should first be divided; and, while the bone is depressed and twisted, in order to render the capsular ligament tense, the latter part may either be cut through with scissors, as recommended by M. Malgaigne, and then the probe-pointed bistoury used, or it may be divided at once, together with the external pterygoid muscle, by means of the probe-pointed bistoury kept close to the highest part of the inner side of the condyle, so as to leave the internal maxillary artery safe at the inner side of the neck of the bone.

A great deal of the safety of this operation will depend upon the edge of the knife being kept close to the inner surface of the bone, so that the lingual branch of the fifth nerve may be left uninjured and upon attention being paid to the directions given for the disarticulation, which, after the insertion of the temporal muscle has been divided, is greatly facilitated by depressing the anterior part of the bone forcibly, and twisting the condyle itself. The haemorrhage will be chiefly from the facial, dental, and branches of the temporal and internal maxillary arteries.

Instead of making the flap exactly in the manner above described, I prefer making, first, the anterior perpendicular incision, and then another, beginning a little way in front of the lobe of the ear, extending down along the posterior border of the ramus, and then forward along the line of the base till it meets the lower termination of the first wound. This is more simple, and enables the surgeon to get more readily at the external lateral ligament.

In the horrible operation of extirpating the whole of the lower jaw-bone, the incision should extend from a point a few lines in front of the lobe of one ear, down the posterior edge of the ramus, along the whole base, from one angle to the other, and then up to a point a few lines in front of the lobe of the other ear. Care having been taken to prevent retroversion of the tongue, and the
front portion of the flap raised, the soft parts behind the symphysis should be cut, and the bone sawn in this situation. Then the rest of the vast flap is to be raised on each side, and each half of the bone to be removed according to the foregoing directions.

THE PATHOLOGY OF THE JOINTS.

[Diseases of the synovial membranes.

The synovial membranes are arranged on the same general plan as the serous, forming like them closed sacs. That they pass over the surfaces of the cartilages can no longer be a subject of doubt, since, in addition to the previous strong and almost sufficient evidence in favour of that view, Henle has found, with the microscope, that a fine cellular corium covered by a delicate layer of epithelium passes over the exposed surface of all the articular cartilages. There is undoubtedly also "some analogy in the diseases" of the synovial and of the serous sacs; but it is far from perfect; and on the very first point which Sir B. Brodie mentions, that of "swelling of a joint from a preternatural quantity of fluid collected in its cavity, without pain or inflammation," we find an important difference between the two. The dropsies of serous sacs are of two distinct kinds; in one the fluid passes out from the vessels by a power which is entirely local, by an act of secretion; in the other it transudes from them under the influence of simple mechanical pressure, which may be imitated at will by artificial injections, or its excessive effusion is the consequence of some phy-
sical change in the condition of the blood. In the first class of effusions we find the effects of pleuritis, peritonitis, and more definitely, hydrocele; in the second, the ascites of obstructed partial circulation, and the more general dropsy of obstructed circulation from disease of the heart, in which anasarca of the cellular and other soft tissues coincides with effusion into the serous sacs.

Now the synovial sacs are subject only to the first kind of effusions; to those which arise from a local secretory power. It has often been observed as a distinction between serous and synovial membranes, that the one is commonly, the other never, the seat of simple dropsical effusions, and the difference has usually been ascribed to some yet unseen diversity of tissue, or to a yet more vague peculiarity of vital action. We believe that the cause of the distinction lies in neither of these circumstances; but in the peculiar construction of the cavities which the synovial membranes line, and in the difference between them and most of those that are lined by serous membranes. As the blood passes along the vessels in healthy circulation, just sufficient fluid transudes through their walls to keep the adjacent tissues and surfaces slightly moist; but if the pressure of the blood against the walls of the vessels be increased, by any obstacle to the passage of venous blood, or (which comes to the same thing) by an increased force of the arterial blood without any increased means for its passage through the veins, more fluid must of necessity pass through the walls of every vessel that is not supported by the unyielding pressure of some firm substance around it. In all the soft and easily extending tissues, therefore, and in all the cavities with yielding walls, dropsy is thus at once produced, the force of the obstructed blood being amply sufficient to distend those parts. But it is different with the hard tissues and the unyielding cavities, such as the cartilages, the tendons, the cerebro-spinal cavity, and the joints; in these no mechanical dropsy (such as arises from disease of the heart) can take place, for the same force by which the fluid is effused in increased quantity in the parts already mentioned, is totally un-
able to distend them. Hence, though all the tissues around them are soaked in fluid, no tendon or cartilage is ever anasarcous in a general dropsy; and this not for want of vessels, but because the walls of those vessels are bounded by unyielding tissues into which fluid could transude only under a far greater force of pressure. For the same reason, while in similar cases the abdomen and the pericardium are distended, and the lungs are compressed by the fluid effused from the obstructed vessels within and around them, the nervous centres in their cavity of fixed and unalterable size, and the joints with their tough unyielding walls, are unaffected.

The dropsies of synovial sacs, then, are entirely the result of a local act of secretion; they correspond to hydrocele, and to the effects of pleuritis and peritonitis, &c.; but there are no affections of the joints analogous to ascites or the coincident effusion from obstruction into other serous sacs. In passing, we would point out these facts as illustrative of the difference between secretion and mere mechanical effusion; and of the varieties of the forces by which, under different circumstances, fluids are made to pass through the walls of vessels. The force of secretion is in these cases shown to be sufficient to produce, in a few hours, such a distension of a joint as could not have been effected in as many years by the force of exudation exercised by an obstructed column of blood driven on even by an hypertrophied heart.

But this affection, this hydrops articuli, in which an increased quantity of fluid is poured into a joint without pain or inflammation, and in which the fluid differs but slightly from common synovia, is of rare occurrence. The more frequent cause of effusion of an increased quantity of fluid into a joint is a distinct inflammation of the synovial membrane.

On reviewing the cases of this class which Sir B. Brodie relates, as well as those that have fallen under our own observation, it is evident that as subjects of morbid anatomy the changes produced by this inflammation present peculiarities of two kinds—one depending on the peculiarity of the tissue itself, the others on that of its construction and arrangement. The latter have been by no
means sufficiently considered, though they are of great importance in explaining some facts which, at first sight, appear anomalous.

As the subject of disease, the synovial membrane cannot be abstractedly considered. Regarded as a homogeneous thin layer of tissue lining the whole joint, it is yet evident that both in health and disease the performance of its functions must be materially influenced by the character of the tissue subjacent to it, and from or through which it receives its vessels. Sir B. Brodie states it as a principle to which all will agree, that “living organs are more subject to have their natural functions deranged in proportion as they are more vascular, and as they are employed in a greater degree in the process of secretion.” But the degree of vascularity in the synovial membranes of different joints, and even in that of the same joint, is by no means fixed; the same membrane where it lines the articular cartilage is far less vascular than where it lines cellular tissue or fat; less vascular, again, where it is placed on ligament than where it lies on bone or periosteum. The liability to inflammation, and the severity of the results of the same inflammation of a synovial membrane, will therefore be determined not by a certain vascularity peculiar to itself (as they are in muscle or in bone), but by the vascularity of the tissues beneath it: for the vascularity of the various portions of the synovial membrane is determined by that of the tissue through which each receives its vessels.

We might illustrate this principle of the influence of subjacent tissues upon the diseases of lining membranes by several examples; but we will take only one, that of the inflammation of arteries and veins. The lining membrane of the whole system of blood-vessels is continuous and in all its parts similar, whether we receive the older view of an internal thin layer of cellular tissue or the correct demonstration of Schwann, that it is chiefly composed of fibres of elastic tissue, in which, if any, a longitudinal direction is discernible, and whose surface is lined by a fine epithelium. In either case the linings of the arteries and veins may be considered identical. Yet how different are their diseases.
Acute arteritis is one of the rarest affections, but acute phlebitis is of comparatively common occurrence. And in the effects of each there is no less marked a difference; in arteritis the highest degree of inflammation produces only a slight effusion of lymph or adhesion; while in phlebitis, suppuration, and the abundant formation of lymph, are common and almost constant effects. There seems no other sufficient reason for such a difference in the results of the same disease in two tissues of the same kind than this—that in the one the tissue receives its vessels from a surrounding very vascular layer of cellular membrane, in the other from a layer of elastic tissue, in which vessels are but just demonstrable; and that in each part its own vascularity is directly proportioned to that of its subjacent tissue.

Other examples of a similar kind will at once present themselves to the reader's mind. To apply the principle which they establish to the affections of the synovial membrane: the tissues on which it is placed might be arranged, according to their vascularity, in the following order: adipose and cellular tissue; bone and periosteum; tendon and ligament; fibro-cartilage; articular cartilage; and as a general rule, (to which, however, certain local circumstances will cause individual exceptions,) we think it will be found that the morbid changes of the several parts of the membrane lining these tissues, both in severity and frequency, follow the same series.

When, for example, we examine an old diseased knee-joint, in which the history shows that inflammation commenced in the synovial membrane, we do not find its whole lining equally affected; but by far the most severe results of the disease are seen on the portions beneath which adipose tissue is placed, as above and by the sides of the patella; here it is most thickened, most spongy, most vascular, and covered by the greatest quantity of lymph; on the periosteum around the edge of the cartilage, and on the front of the crucial ligaments, similar effects are much less in degree; and on the surface of the cartilages they are altogether absent. But the synovial membrane is over all these parts, per se the
same; and there is every reason to believe that all of it is simultaneously and equally attacked by the disease; so that there can scarcely be any other cause for the differences than the different natures of the subjacent tissues.

In like manner, (though in the determination of this result there must be many more modifying circumstances,) we believe that the comparative frequency of disease of the synovial membrane in different joints, depends in great measure on the degree of vascularity of the tissues by which the walls of each joint are formed. In none is the disease so common as in the knee-joint, and no joint has more of its synovial membrane in contact with adipose tissue: next to the knee in this respect may probably be placed the elbow, and here again a considerable quantity of loose and vascular tissue surrounds the joint; while in the hip, where there is a complete and dense fibrous capsular ligament, with the low degree of vascularity peculiar to that class of tissues, primary disease of the synovial membrane is by comparison of very rare occurrence. Sir B. Brodie regards the exposure to cold as the chief cause of the frequency of inflammation of the knee-joint, and Mr. Adams partially coincides in that opinion: the influence of cold cannot be denied, but its sufficiency may be doubted when the disease is far more rare in the wrist and ankle, which are more exposed to cold than the knee, but a greater portion of whose contour is occupied by fibrous tissues.

These circumstances, then, which are often regarded as anomalies, namely, the varied frequency of common inflammation of the synovial membrane in different joints, and the varied degrees of its severity, as exhibited in its products, in different parts of the same joint, are, we believe, fairly explained by the different degrees of vascularity possessed by the surrounding subjacent tissues, from which the synovial membrane receives its vessels. We may now proceed to the diseased appearances whose peculiarities are more probably referrible to the nature of the synovial tissue itself.

The effect most commonly and often permanently left by in-
flammation of the synovial membrane is thickening. This differs from the analogous change produced in a serous or mucous membrane, by the parts being less dense and firm; the thickened part is soft and easily tears; it has a spongy oedematous character; its free surface, instead of being smooth and polished, acquires a delicately granulated or almost villous aspect, not unlike that of a granular conjunctiva; and at the edges of the cartilages it often overlaps them, just as a chemotic conjunctiva overhangs the margin of a cornea.

In this condition the tissue of the membrane undergoes no material change; it is only swollen by the effusion of serous fluid and usually of lymph into its areolæ, which, if the affection be not complicated with other articular diseases, are often rapidly removed after counter-irritation or other means. There is another state which possesses some, though an obscure relation, to this simple thickening, but which is much more serious in its nature. Sir B. Brodie regards it as a change peculiar to the synovial membranes of joints, and belonging to the same class with tubercle, carcinoma, &c.

"The morbid action evidently originates in the synovial membrane, which loses its natural organization and becomes converted into a thick pulpy substance of a light brown and sometimes of a reddish-brown colour, intersected by white membranous lines. As the disease advances, it involves all the parts of which the joint is composed, producing ulceration of the cartilages, caries of the bones, wasting of the ligaments, and abscesses in different places."

This form of disease is that which Dr. Lederle, with most of the German writers, describes as fungus genu, and to which he applies the extraordinary appellation of "dynamico-vegetative pseudoplasm." It is also one (and if they understood any thing definite by the name, the especial) form of disease described by the old writers as white swelling. We are inclined to think that it is more commonly an effect of simple chronic inflammation of the membrane than Sir B. Brodie regards it; its most common situa-
tion, the knee, is that in which the synovial membrane is far most frequently inflamed; its history is often that of protracted inflammation; the shades between it and common thickening are so numerous that they are scarcely separable; and it does not, like other specific or malignant diseases, affect either the same tissue in different parts or different tissues coincidently. Further pathological investigation is still necessary on this subject; the interest of which is the greater because the disease in its advanced stages admits neither of cure nor alleviation; and if it be in any case the result of the neglect of a more simple disease, its prevention should of course be the object of much greater care than is usually bestowed on common stiff joints.

In thickening of synovial membranes, serum and lymph are effused in the areolæ of its tissue, and very generally in the adjacent parts, which become hard, tough, and unyielding, lose all their power of sliding upon one another, and in some cases form an almost homogeneous, brawny, infiltrated mass, in which the dissector has difficulty in discovering even those things that in health are among the most prominent. At the same time, lymph and serum may be secreted on the free surface of the synovial membrane, and into the cavity of the joint. The effusion of lymph, however, is on the whole less frequent in the synovial than in the serous sacs; a circumstance in which again they appear in some measure intermediate between serous and mucous membranes. The lymph may form adhesions between the opposite surfaces of the membrane; for adhesions are the result of inflammation, not of any particular tissue, but of all tissues which are so arranged as to present two surfaces sufficiently near each other to permit the lymph effused upon one to adhere to that upon the other, and thus in one mass with it to be organized. Where this arrangement is wanting, whatever be the tissues inflamed, it is evident no adhesion between them can take place. In the synovial sacs adhesions are on the whole less frequent than in the serous; probably in consequence of the little power which some of the tissues composing the former possess of producing or re-
ceiving new vessels. Thus, suppose lymph effused on the surface of a synovial membrane opposite a cartilage; the chance that the cartilage will either produce or receive new vessels to communicate with those that form in the lymph is but slight. But there are only a few parts of the joints in which the synovial membrane covering one tissue is not opposed to that covering cartilage, and the adhesions that do form are generally found in these parts, as, for example, where the synovial membrane of the wall of the joint is opposed to its own reflexion over the bone. Hence in the knee, the frequency of the cases in which the cavity of the articulation is obliterated above the patella, and at the sides of the condyles of the femur, and round the head of the tibia. The cases are rare in which adhesions pass to the surface of the synovial membrane covering the cartilages: but they occasionally happen, and are, we think, more common in the ankle than in any other joint. There are several specimens of the kind in the museum of the College of Surgeons: and we have seen more than one in which a distinctly vascular adhesion passed from one cartilage to the other without having any connexion with the more vascular parts of the synovial membrane lining the walls of the joint; evidence which alone affords as good proof of the vascularity of cartilage as most facts in medicine are based upon.

The next degree of the effects of inflammation of the synovial membrane is suppuration. It affords a good example of the production of pus without ulceration; though the doctrine of suppuration from a sound tissue has lost its verbal truth since Henle proved the existence of a synovial and a serous epithelium, and rendered it probable that before pus-globules can be produced from a membrane’s surface, the epithelium cells must be removed. The pus is therefore produced from the raw surface of the synovial membrane, just as it is from the cutis when its epidermis is removed. The production of pus, like that of dropsies in synovial sacs, is by a process of secretion, which overcomes all the resistance of the walls of the joint, and often distends them to an enormous size. In this case there can be no doubt of the propriety of
Sir B. Brodie's advice that the fluid should be let out by an opening made into the joint; the sufferings which the patient endures from an otherwise irremovable and still increasing collection of fluid distending all the tissues around it, at once declare the necessity of the measure. He limits the practice to these cases; and except in considerable collections of pus we cannot but doubt the propriety of cutting into a joint. Yet there are many good practitioners who do not hesitate to adopt the same means in many other cases, under the idea that the inevitable ankylosis will be accelerated. Their arguments for this practice, however, seem to furnish their own contradiction: it is true that ankylosis often follows the wound of a healthy joint, and so does death sometimes; but, say they, the opening of a diseased joint is very different from opening a healthy one; it produces no ill effect, and may be done with perfect safety. But if it produces no ill effect, will it produce ankylosis, which is the most common ill effect that follows it when performed on a sound joint? For what are the obstacles to the occurrence of ankylosis in the common course of the disease which the operation removes? We believe none—unless the opening lets out such a quantity of fluid as was sufficient to separate the surfaces that should adhere. For osseous ankylosis to take place, the cartilages must be removed and the bones exposed; granulations must arise from each of them, and, uniting, become osseous; if pus or any other fluid keep the granulations apart and prevent their union, it should undoubtedly be removed; but if not, the process will go on as plainly as the union of a simple fracture, and, for aught we can see, it would be as wise to pass a lancet between the ends of a broken bone, under the idea of accelerating their union, as to open a joint not full of pus in the hope of accelerating its ankylosis.

If the pus be not artificially removed from a joint, it will slowly make its way out by ulceration through one of the spaces between the dense tissues of the walls, or, if the joint have a capsular ligament, through the meshes of its fibrous fasciculi. The aperture first forms where the resistance is least, in accordance with
common physical laws; the fluid pressing equally in all directions, distends and produces its injurious effects most rapidly where the parts are weakest. The artificial opening of the distended joint is thus the more advantageous, because it is a rare coincidence in which the weakest is at the same time the most dependent part; and a naturally formed opening will seldom be placed so as to permit the fluid to pass off by it rapidly enough to keep the joint empty. Thus in the knee, openings most frequently form at the sides by the lateral ligaments; or in front just by the sides of the ligamentum patellæ; or if they form behind, it is too often by the pus creeping through a long and tortuous course, in the ham and down by the heads of the gastrocnemii. An artificial opening may of course be made wherever the patient's position and other circumstances render it most desirable; cæteris paribus, that which Sir B. Brodie recommends, in the most depending part, will be the best.

That important morbid condition in which pus is simultaneously deposited in a number of joints is still, as to its pathology, most obscure. Scarcely any advance has been made in our knowledge of it since Mr. Arnott’s admirable paper on Phlebitis was published in the Medico-Chirurgical Transactions. Of its frequent coincidence with phlebitis there can be no doubt; but it is far from proved to be a consequence of it: on the contrary, cases are not wanting in which the venous system, though carefully examined, has been found quite sound. On all connected with these cases much more evidence is yet required; and it is to be hoped that their explanation will be one of the first practical results of the microscopic observations on pus and suppuration, which are now occupying so many active minds, but have as yet been lamentably barren of profitable results.

In the natural progress of disease, the pus formed in a joint will pass out of it by ulceration; it is much more rare for it to pass from without inwards, and by ulceration to produce perforation of a joint. But such cases (though as yet, we believe, almost undescribed) do occur, and they are perhaps the most terrible in
their symptoms and progress of all the diseases that affect the joints; for they are equal to the ulcerative perforations of the serous saes in their rapidity of local progress, and though less quickly fatal, are even far more painful than they are. Happily the conditions in which they can occur are but few; they are only those in which a collection of pus is formed in some tissue adjacent to a joint, and is prevented from making its way externally by some dense unyielding substance between it and the surface of the limb. This is sometimes the case when the head of a bone is necrosed, or has a suppurating cavity formed within it; as the fluid increases, and the bone around it is removed, it may at last perforate the joint through the ulcerated cartilage, and the destruction that follows it is alike rapid and painful. More rarely, an abscess formed externally to the joint opens into it at some part where the synovial membrane is guarded by weaker tissues than those which lie superficially to the pus, and in these cases also, a rapid destruction of cartilage, with intense inflammation of the synovial membrane and the most acute suffering are sure consequences. Amputation, which the severity of the symptoms at once demands, probably affords the only prospect of recovery.

We have considered the several degrees of the affection of the synovial membrane separately, because it is of the utmost importance in their treatment to know that in the early stages of disease of the joints only this part may be affected, and that, therefore, the limb may by timely and proper care be restored to complete health. Sir B. Brodie particularly insists on the necessity of knowing what the early conditions of these diseases are, before they have proved fatal to the limb or life by involving all the tissues adjacent to that primarily affected. It is probably from lack of opportunity of observing these early changes, that nearly all writers but himself describe the affections of joints as so complex and so rarely isolated in any one of the tissues composing them. This is in some measure the case with Mr. Adams, who, though not denying the probability that the diseases of a joint may commence in any one of its tissues separately, yet refuses to

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take advantage of the evident distinctions that might be founded on that fact, and writes of inflammation of the hip-joint (arthritis coxae) in general, distinguishing only the three forms of acute, strumous, and chronic rheumatic inflammation; and of the diseases of the knee-joint, under the general name of arthritis genu, distinguished only into acute, simple chronic, chronic rheumatic, and chronic strumous arthritis. This, however, is depriving morbid anatomy of much of its practical benefit. To be sure, when we get a diseased joint to look at, it is in general only when it had ceased to afford any hope of ever being useful to the patient, and when he is either dead or maimed; and then no doubt we may find the ravages of synovitis, chondritis, osteitis, and many more such enemies as formidable in nature as in name; but we should remember that there probably was a time when there were fewer to contend with; that all these crept in one by one, each establishing himself on the ground near that which was already occupied by one of his allies. If any thing is to be done for the cure of this class of diseases, it must be attempted before many of the tissues are affected; the chances of benefit are always inversely to the number of those terrible ites, and the more separately we consider them all, the better shall we be prepared to combat with each.

We pass now to the consideration of the morbid alterations of the articular cartilages, and we come at once upon a fundamental question: Are there any proper diseases of articular cartilage? Are not all those that are so called the results of disease of the adjacent tissues and of the action of their products? The doubtful circumstances on which the answers to these questions must ultimately depend is the organization, or, to speak more definitely, the vascularity of the cartilages. We will first consider the statements and opinions of those who oppose the vascularity and independent morbid alteration of these tissues, and then express our own opinions and those to which we assent.

The work of Dr. Schumer affords a good summary of the arguments generally advanced by the opponents of the independence of cartilages. The vascularity of articular cartilage might,
as he rightly says, be determined, 1st, by the flow of blood from a wound of its substance; 2nd, by injection; 3rd, by microscopic examination; 4th, by the morbid changes, if they are of the kind which cannot occur without vessels. But by none of these means, he and many others affirm, can their vascularity be demonstrated.

That no blood flows when an articular cartilage is wounded we readily admit; but no blood flows when the iris is cut, as in making an artificial pupil, or in any other operation, unless it is torn away from the ciliary ligament. Yet who doubts the vascularity of the iris, or that it is subject to peculiar diseases? And the tissue of articular cartilage is even more adapted for the prevention of hæmorrhage from vessels divided in it than that of the iris is; for it is compressed within the limits of the space which, by its unrestrained elasticity, it would occupy, and therefore, when it is cut, its particles instantly spring up against each other, and at once close any vessel that may be divided. The evidence of the absence of bleeding from its wounds is therefore valueless; the hæmorrhage from a tissue is not directly proportioned to the size of its vessels, but to the circumstances in which they are placed, whether the tissue around them is unyielding or loose, whether and how soon they can contract, &c.

The evidence of injection is equally unsatisfactory. It is, we believe, true that no one has yet succeeded in forcing a coloured fluid into the very substance of the healthy articular cartilage; but it may be driven into vessels running over its free surface. We have done this in a perfectly healthy joint; but it is much less difficult when, by an inflammation, the synovial membrane covering the cartilage is slightly swollen; injection will then pass in distinct branching vessels derived from the circulus articuli vasculosus, for more than half an inch over the edge of the cartilage, in exactly the same manner as the vessels pass from the conjunctiva over the front of the cornea. Now it is not in the smallest degree probable that these vessels stop suddenly at this distance upon the surface of the cartilage, without passing like
those of the cornea (to which they are in other respects so similar) over the whole surface, and dipping into the substance of the cartilage itself. Nor is it more probable that a dense non-vascular tissue should thus be placed between two vascular surfaces; there is but one instance in the body of a non-vascular organ so situated—the crystalline lens—and we need not say how distant is the analogy drawn between it and an articular cartilage.

In addition to these vessels of the synovial membrane covering the cartilage, we believe that another set exists which pass vertically from the bone through the little canals, which are so distinct by the ink points that are seen when a slice is cut from the surface of the cartilage of a young animal. These have not, indeed, been yet injected; but the art of injecting is not yet so perfect that from its negative evidence we can have any right to draw a positive conclusion. The vessels of the healthy cornea have been demonstrated by injection only within the last four years; those of the cartilages of the ribs and larynx within the last ten years; and those of the tendons have only been injected within the last twelve months. The articular cartilages evidently present many more difficulties to injection than these; but there is no reason to believe that they may not yet be surmounted. Till the tissues just mentioned had been injected, their vascularity was denied or doubted by those who are not content with any but visible proofs; but long previously, their morbid changes were sufficient to establish their vascularity to every impartial mind.*

That vessels should be invisible when the articular cartilages are examined with a microscope is no wonder; they cannot when empty be discerned by it in many even of the most vascular tissues.

We come, then, lastly, to that which is by far the most interesting and important argument for the existence of an inde-

* Since this was written our belief has been most happily confirmed by Mr. Liston's account of his injections of the articular cartilages of diseased joints, in a paper read at the Medico-Chirurgical Society.
pendent morbid action in the cartilages, and that such an action as we cannot conceive to be carried on without blood and blood-
vessels—the changes which they undergo in disease. This sub-
ject has been examined experimentally, and especially by Dörner,
Gendrin, Cruveilhier, and Schumer, and the general result of
their investigations is the impossibility of exciting any evident in-
flammation in an articular cartilage by any mechanical injury.
But it is clear that these cases furnish of themselves the contra-
diction to the conclusions drawn from them; for no effect was
produced by the injury upon the cartilage, although all the other
tissues of the joints were vehemently inflamed. Now, if the
cartilage were not destroyed by the action of its own vessels,
why was it not destroyed by those means to which they ascribe
its destruction in common inflammations of joints? The experi-
ments show that in the midst of a most acute inflammation of the
synovial membrane, such as is produced by cutting a joint wide
open, the cartilages remained for some days unaltered. They,
therefore, prove nothing; for they are as strong evidence against
the power of any external means produced by synovial inflam-
mation to destroy the cartilages, as they are against the carti-
lage being able to destroy itself. They only prove that in an
acute inflammation of a joint, the cartilages are not always ul-
cerated.

But suppose that by disease, or after an experiment, the car-
tilage is removed from the head of a bone. What are the means
by which that removal has been effected? Softening and solu-
tion in the pus or other fluid effused into the joint? Absorption
by the surrounding synovial membrane, or a tissue produced from
it on purpose? Or independent ulcerative action in the car-
tilage itself? The first is the common opinion of those who do
not receive the third—the second is that propounded by Mr.
Key—the third is that of Sir B. Brodie and many others, and
that which we have now little hesitation in adopting. The first
two explanations can be applied only to those cases in which the
cartilage is progressively removed from its synovial surface to-
wards the bone; they can have no application in the cases in
which its removal is effected in the opposite direction, in which it
is, as it were, undermined, and its connexion with the bone de-
stroyed. In these latter cases it is by all supposed to be absorbed
by granulations produced from the bones; but we shall offer some
reasons for doubting the correctness of this view.

First, for the theory of solution in pus. Schumer relates an
experiment in which a portion of cartilage, placed in a suppurat-
ing fistulous passage, was found, after seven days, opaque and
yellowish, and half dissolved. But ten such experiments could
have no weight against the fact which every one must have had
the opportunity of observing, viz., that after pus has remained
even for many days in a joint, the cartilages may still be neither
softened nor in any other way altered; and that if they are
irregular in certain isolated parts of their surface, the parts
which still remain attached to the bone are quite firm and po-
lished. This is especially the case in that class of suppurations
which occur coincidently in several joints, and which we have
already alluded to as sometimes accompanying phlebitis. In these
cases, after a joint has been distended for many days with pus,
all the evident change in the cartilage is, that a portion seems as
if it had been chipped out of it with some blunt instrument. The
surface that is left, and all the rest of the cartilage is still firm,
of its natural bluish-white colour, and intimately attached to the
bone. Now, if pus had the least power of dissolving cartilage
in the living body, such facts as these could never be observed;
the cartilage, in such a suppuration of a joint, would be evenly
thinned over its whole extent, and that which remained would
be soft and loose and half dissolved, or flocculent and unable to
bear the pressure of the finger; but such an appearance is, in
common inflammation of a joint, never seen. Portions of car-
tilage are always entirely removed; and that which remains pos-
sesses a healthy aspect if not its normal connexions.

The theory of Mr. Key, which is in part adopted also by Mr.
Adams, is far more ingenious, and is founded on facts of more
seeming authority than this of solution by pus. An admirable criticism of it forms the greater part of the important appendix to the present edition of Sir B. Brodie's treatise. The theory is briefly this:—When ulceration of the cartilage ensues as a result of synovial inflammation, the removal of its tissue is effected not by its own vessels, but by those of a very vascular process of synovial membrane which grows over the border of the cartilage, or by those of a similarly vascular membrane produced from the synovial membrane, and receiving its vessels from it, which spreads over the free surfaces of the cartilages and absorbs them.

The fact upon which this theory is founded is, that in many cases where the synovial surface of a cartilage is grooved, or as Sir B. Brodie happily expresses it, chiselled out by ulceration, the depression is found occupied by a process of membrane from its synovial lining, which has a very vascular and fringed border, like one of the "glands of Havers." This Mr. Key believes has absorbed the cartilage by a process analogous to that by which the removal of the sequestrum of cylindrical bones under necrosis takes place. Now the question of the absorption of dead bone is too long to be entered upon at length here; but we may observe that the experiments of Mr. Gulliver, supported as they are by many facts of constant occurrence, render it certain that a sequestrum separated from its vascular connexion is never, in any degree, absorbed by the surrounding vascular parts, but remains, as the loose fragments of fractures often do, unaltered for months and years. The same experiments render it very doubtful whether a dead portion of bone, even still adhering to living bone, is ever lessened by the absorption of the vessels of another part; much less then is it probable that a living tissue, however slightly vascular, should be absorbed by the vessels of another adjacent tissue; nor do we know a single example in which it can be proved that the vessels of one living part or tissue have the smallest share in effecting the ulcerative removal of another. It is evident, therefore, that no imagined analogy to
any of these other processes is deducible in favour of Mr. Key's view, for they are themselves, if not opposed to his idea, at least most ambiguous.

Again, it is clear that this assumed mode of ulceration by the action of a destroying growth from the synovial membrane cannot explain all cases; for in many there is no such growth; in many the cartilage is removed when it was opposed to another cartilaginous surface, and in these and in many more the ulceration occurs in a part of the articular surface to which no synovial growth could have access, as on the very centre of the patella, on the middle of the condyles, and on the head of the femur not near the ligamentum teres, on the middle of the head of the humerus, &c. From all these parts portions of cartilage are often found removed while that around them is healthy; so that it is evident that even in some of the cases in which the membranous process does exist, it could only have arrived at the ulcerated part by passing over the healthy surface. But in many of these cases of isolated ulceration, and indeed in the large majority, the synovial membrane has no processes growing from it at all. And it is not in the least probable but that in all these cases the process employed is essentially the same; a single case, therefore, in which a growth from the synovial membrane is not found, though the cartilage is absorbed on its synovial surface, would throw great doubt upon the theory; and when such cases are far from rare, they must be fatal to it. They are so far from rare that we believe that many surgeons to whom the ulceration of the cartilages is a familiar appearance, have never yet seen such processes from the synovial membrane as Mr. Key describes.

But still this vascular growth is sometimes seen exactly fitting into the cavity in that portion of the articular surface from which the cartilage is removed, and certainly, to an imaginative mind, it looks just as if it had been eating and growing on the food it derived from the edges of the hollow it has made; it looks like a worm in its hole. How then did it get there? To explain it,
the structure of the joints must be considered; they are cavities
with firm and scarcely yielding walls, and they admit of no change
of volume except with an inversely proportioned alteration in the
quantity of their contents. If the cavity of a joint increase in
size, more substance must pass into it to fill it; if it decrease in
size, something must pass out of it. They are, in this respect,
exactly analogous to the cranium, into whose cavity, if the mass
of the brain become smaller by atrophy or other loss of substance,
more fluid must be and always is effused; if the brain become
larger, fluid must pass out of the cranium, (unless in children, in
whom the head can expand,) and the brain is then found dry and
without fluid either in its ventricles or membranes. There are
cases of cerebral disease in which effects are observed exactly
analogous to this growth of the synovial membrane into the joints.

When, in consequence of an apoplectic effusion, an abscess or
any other disorder in which a portion of the brain is destroyed,
the volume of the contents of the cranium is lessened, inasmuch
as the size of its cavity remains for a time unaltered: it is certain
that either something must be added to the volume of the con-
tents, or that the volume of the cavity must be reduced. The
contents of the cavity must exactly fill it, or a vacuum would
exist, which we need scarcely say is impossible. The subject is
admirably illustrated by some of the cases of atrophy of the brain
detailed by the late Dr. Sims, in his paper on that subject, in
the 19th volume of the Medico-Chirurgical Transactions:—"The
chasm occasioned by the atrophied state of the brain," he says,
"we observe to be sometimes filled up by serous fluid and by
deposits of bone on the skull"—"the hypertrophy which takes
place in the bones of the cranium is very frequently confined to
the inner surface of the os frontis, in other cases it is more ge-
neral."

There can be no doubt that in the living body as in inorganic
matter, if the size of an air-tight cavity be increased, its contents
must expand, or if not expansible, must have something added to
them to fill the cavity; or if the size of the contents of a cavity
be diminished, its walls must fall in. These are the simple principles on which, when in the adult the brain grows larger, the skull grows thinner; and when the brain becomes smaller the skull becomes thicker, or more fluid than natural is effused within it. To apply the same principles to the disease of the joints now under consideration; a portion of the synovial surface of an articular cartilage is removed by the ulcerative process of its own vessels; what is to fill the space thus produced in the cavity of the joint? In most cases, as in most of atrophy of the brain, fluid (either pus or synovia) is effused in increased quantity; but in some, as in some of atrophy of the brain, the surrounding tissues grow in and fill up the chasm. The process, or as it might be called, the hypertrophy of the synovial membrane, is the exact analogue of the hypertrophy of the bones of the skull.

In this explanation nothing improbable is involved. It is assumed that the first change is the absorption of the cartilage, and that it may be the first is certain because in some early examined cases it is the only change; by such an absorption a vacuum must be formed in the joint; and something must fill it up; that something is either fluid or an increased growth of synovial membrane, or a newly-formed false membrane. We can indeed determine, if the part of the cartilage absorbed be known, what will be produced to fill its place; if the middle of the surface be ulcerated, fluid will be effused and no membrane produced; if the borders of the cartilage, then membrane grows into the cavity as fast as it is formed.

Thus much of the presumed explanations that have been offered of superficial ulceration of articular cartilages, to remove the apparent difficulty of their possessing too small a degree of vascularity to effect their own ulceration. Neither of them is free from far greater objections than those which they are intended to surmount.

The opinion is more commonly received and certainly more plausible, that in the deep ulceration in which the cartilage is undermined from its connexion with the bone, the vascular
granulations that grow into the hollow between them are the agents by which the absorption of the under surface of the cartilage is effected. But even against this view there are many objections; as the improbability of one tissue being absorbed by the vessels of another, and that healthy bone (for in some though not in most of these cases the bone is found unaltered) should produce granulations to do such irreparable mischief. It is certain that if the absorption of the under surface of the cartilage were the first step in the process, granulations or something must grow from the head of the bone to fill up the cavity that would else be formed; and that the cartilage is first absorbed is rendered probable by the frequent coincidence of similar absorption on its opposite (synovial) surface, which we have already shown is often a primary affection.

The growth of granulations into such a cavity as the independent ulceration of the under surface of the cartilage would form is easily producible at will. If a hole be bored in a bone and the integuments replaced over it for a few days, and then again raised, the hole will be found exactly filled by a growth of vascular granulations from the surface of the tissues that lay over it, just as in this case each little cavity on the under side of the cartilage is occupied by a growth of granulations from the subjacent bone. The same action no doubt produces the granulations in both cases, as well as in all those in which granulations appear to be eating away the surface of an ulcerating tissue. In all the growth and increase of the granulations is secondary; a necessary consequence of the removal of adjacent tissues; they do not form the holes, but they grow into the holes that are formed by the tissue's own vessels.

The explanations, then, which the opponents of the independent morbid action of the cartilages have offered, are at present insufficient to account for the phenomena. The removal of cartilage is fairly referrible only to a process of ulceration, which is effected by its own power; and even in the absence of any other evidence for their vascularity, this alone might be
sufficient proof of it. When to the evidence which it affords we add the proof of the vascularity of their synovial surface, the occasional appearance of vessels even in their substance when diseased—as in the case described by Mr. Mayo,—the occasional existence of a vascular false membrane passing from the synovial surface of one cartilage to that of another, without any communication with the walls of the joint, and without any apparent vascularity of the adjacent synovial surface,—the peculiarities which it presents in some other diseases,—the weakness of all the objections invented against its vascularity, and all the evident improbabilities of a non-vascular substance existing in such circumstances and presenting such phenomena as cartilage does,—by all these the vascularity and independent power of this tissue may be deemed sufficiently well established to be admitted in the explanation of the various forms of ulceration to which it is subject.

Of all that have been offered, the most concise and correct view of the ulcerations of cartilage is, in our opinion, that which Mr. Mayo has given in the paper just referred to; it is that which, with very slight modification, we should exactly adopt. There are three kinds of ulceration of articular cartilage; one in which it commences from the synovial surface; a second in which it commences at the surface next the bone—in both these the substance of the cartilage that remains is white, firm, and scarcely altered in appearance; in the third kind the remaining cartilage is softened, and converted into a fibrous or brush-like substance.

In the first class of cases, which may be called simple superficial ulceration, a portion of the surface of the cartilage looks as if it had been irregularly chipped or chiselled out; the surface thus exposed retains its natural colour, its firmness, and its polish. When a joint thus affected is opened, it is scarcely imaginable that so little should be left by such formidable symptoms as those by which the disease was accompanied; for sometimes the redness of the synovial inflammation by which
this form is accompanied has passed away, and nothing is found but the uneven cartilage. The most common cause of, or at least coincidence with, this kind of ulceration, is intense or long-continued inflammation of the synovial membrane, such as occurs in penetrating wounds of the joints, or in perforation from ulceration, or in the diffuse suppurations met with in phlebitis, or such as are sometimes produced by any of its common causes, as cold, &c. The effusion of pus into the joint is of course the result of the synovitis, and is generally coincident with the ulceration of cartilage; but neither it nor the effusion of lymph are essential to this affection. Most commonly there is also coincident ulceration of the cartilage on the surface next the bone; but in some cases this is absent, and especially, we think, in those which accompany the general and apparently metastatic suppurations in phlebitis; in these the cartilage always retains its firm connexion to the bone, and can no more be torn from it than it can in health. When the ulceration in this form has extended down to the bone, it exposes a healthy surface, or one only increased in vascularity; and at any period one may determine that the ulceration commenced on the synovial aspect, by observing that the exposed portion of bone is smaller than the area of the synovial aspect of the ulcer, so that the borders of the ulcer shelf downwards and inwards, and have their thin edges more or less adherent to the bone that is exposed.

In the second kind of ulceration of articular cartilage, which may be called simple deep ulceration, the cartilage is at first removed only on the surface next the bone; it is undermined, and may be torn up from the osseous surface, or is even found hanging from it in pieces, or lying loose in detached portions in the interior of the joint. Its under surface is rough and irregular, as if coarsely worm-eaten; often its whole thickness is perforated, and on opening the joint the cartilage looks riddled with little vascular masses of granulation projecting through its apertures from the bone beneath it.
The exposed surface of bone is highly vascular, and wherever the cartilage is separated, is covered by prominent, soft, and very red granulations, which fit into the cavities on the under surface of the cartilage. It is probably to the pressure of the cartilage on these granulations that the exquisite pain which accompanies this form of the disease may be ascribed. The cartilage itself can scarcely be the source of pain of the character here felt; but the peculiar acuteness of the suffering produced by even lightly touching the granulations from bone is sufficiently well known.

In some cases the bone is evidently softened and atrophied or ulcerating; but in others it retains all its firmness and, except for an increase in its vascularity, might be deemed healthy. The latter is rarely found in diseased hip-joints; but more commonly in the most acute cases in which ulceration of the cartilages occurs in coincidence with intense synovitis; in chronic cases the disease, commencing with a moderately acute inflammation of the synovial membrane, goes on to affect in turn all the tissues belonging and adjacent to the joint, or it commences in the cartilage, or simultaneously in the bone and cartilage. The ordinary cases of chronic diseased knee-joint are examples of the first kind; those of morbus coxae, the scrofulous diseases of the hip-joint of young subjects, are instances of the second.

In all these forms of disease, however, and whatever be their origin, their ultimate effects, if unchecked, are disorder and functional destruction of every tissue. The effects of the first stages can be learnt only by the examination of extremely acute cases, and of those in which accidental death has prematurely placed them at our disposal, or by the careful comparison of a great number of advanced cases. From both the result is, that the absorption of cartilage may be the initiative; but that in the majority of cases it is subsequent to inflammation of the synovial membrane.

The third form of ulceration of the cartilages in which its tissue
ON BURNS AND SCALDS.

Burns and scalds produce three different effects,—vesication, desquamation, and gangrene. If called in when a vesication only is produced, there is no danger, although the vesicles be numerous and extensive. The object is to preserve them from bursting, and therefore do not open them on any account, but allow the serum to accumulate in them until a new cuticle is produced; the serum escapes, and there is no further mischief. But if you open them, there is a constitutional effort produced, which is followed by considerable inflammation, and sometimes by suppuration, and the sufferings of the patient are very great. All you have to do is to apply evaporating lotions, as the camphorated spirits of wine, or spirits of wine and the lotio alba, to prevent the disposition which there is in the cuticle to break. A little opium should also be given to allay the irritability.*

But when the second effect I have spoken of is produced, when the burn is severe enough to separate the cuticle from the surface of the body, the most violent symptoms arise; as when a person falls into boiling water or wort. The exposure of so large a quantity of cutis produces a great constitutional effort in the reaction that takes place; but sometimes a person dies from the shock made on the nervous system, without any reaction having taken place. A child spilt some tea, which ran over his chest and abdomen, and he died in three days; therefore the desquamation of the cuticle is the worst form of injury, from

* A thick solution of gum Arabic, flour, liquid pitch, in short, any convenient and easy application that will afford protection to the injured cuticle, and then rolled up in cotton wool, and not to be disturbed till well.—Ed.
leaving the cutis unprotected. The spirits of turpentine is the best application in this form of burn; as the object is to excite a speedy reaction; and if you apply evaporating lotions, reaction can never take place. Lime-water and oil, and lime-water and milk, have been commonly used; but the spirits of turpentine is the best application. Where the constitution is irritable, and it gives violent pain, dilute it with oil, or with the oil and lime-water, and I think it would then form a very good application. Give opium and wine as long as the chilly state continues; but as soon as the heat is developed, and the pulse has recovered its power, do not continue it any longer, but employ other means to reduce the inflammation when necessary. Turpentine does not succeed where the scald is produced by hydrogen, or carbonated hydrogen gas, so well in London as in the country.

The third state is where the life of the skin is destroyed to a great extent. There is no immediate danger, for the constitution does not suffer in the first instance. The danger is to be apprehended when the sphacelated part begins to separate. The absorbents act briskly, and a great discharge follows the separation of the part. Fomentations and poultices are most useful in these cases, as the turpentine cannot act on the dead surfaces. It is necessary to give wine and opium, as in the former case, during the chilly state. The treatment is just the same, indeed, as in a case of common gangrene; and toward the end, when the process of suppuration is commencing, you may give wine and opium, or ammonia, to support the constitution.

These cases produce the most remarkable deformities. These are not frequently the result of the surgeon’s treatment, as they occur in a great measure after the cicatrization has been completed. They are owing to the natural tendency which there is in the cicatrix to contract. The wounds will often heal smoothly, but afterwards become puckered. These contractions are apt especially to occur in the neck, by which the skin is united to the chest; and if the arm be the burnt part, the fore-arm becomes united to the upper-arm. The fingers become united to
each other, and the thumb is sometimes bent very much backwards. This contraction may be prevented in the arm by passing a splint behind the arm, and keeping the arm extended on it. The same rule should be attended to, if there be any danger of the thigh uniting to the abdomen. You should pass a splint behind the thigh, and keep the thigh extended on it, and the contraction will be prevented. But as to the neck, do all you can, by binding the head back, or to either side, yet the contractions will take place. When the cuticle is removed and the cutis is in a granulating state, you may produce cuticle over it very quickly by using the acetate of zinc wash, made by putting two grains of the sulphate of zinc to one ounce of the liquor plumbi subacetatis dilutus. This object is sometimes well accomplished by sprinkling the granulations with the oxide of zinc. But the lotion appears to me to be the best. Some lint should be dipped in the lotion, and laid on the wound; over this some folded linen should be placed, and over the whole a piece of oiled silk to prevent evaporation.*

[To the foregoing observations I deem it incumbent on me to add more recent information on this subject, for which I am indebted to Cooper's Surgical Dictionary.]-Ed.

Dupuytren concurs with all surgical writers in representing the effects of the action of caloric, as attended with great diversity in respect to their intensity and severity, according as they may have been produced by radiating heat at variable distances, or by the direct action of flames emitted by the combustion of various substances; or by the direct application of the ignited bodies themselves.

Moderate, but long-continued, radiating heat thickens the cuticle, hardens the skin, blunts its sensibility, and renders it more or less brown. These effects are exemplified in persons habi-

* In a very severe case of burning, which occurred to my son from ignited phosphorus while he was lecturing to a public audience, there were evident symptoms of contraction appearing, but I prolonged the cicatrization for upwards of three months, when all tendency to contraction vanished.—Ed.
On burns and scalds.

Actually exposed to the burning rays of the sun, or whose usual occupations are before vast fires. Thus, as Dupuytren observes, smiths are able to grasp with their rough horny hands pieces of iron of a very high temperature, and even to touch them for a few seconds with impunity.

A higher degree of radiating heat produces marbled discolourations in the skin, and cracks in the cuticle, frequently leading to troublesome ulcerations. Such effects are common on the shins of old persons, who are constantly sitting close to the fire. In a still greater intensity, radiating heat will blister the surface of the body, or cause the formation of vesicles. In hot climates, exposure to the solar rays during sleep is alleged sometimes to have excited inflammation, followed by gangrene, and death on the fourth or fifth day.

As for flame, it is described by Dupuytren not only as occasioning an instantaneous burn, like heated substances directly applied to parts, but also as readily drawing animal substances into a participation in the movement of combustion, of which it is itself the product. The animal textures subjected to its action rapidly part with their moisture, become shrivelled and bent, or twisted, and emit a flame, which annexing itself to the first, increases its activity and its ravages.

The great depth and fatality of burns produced by the clothes or dress taking fire, are familiarly known to all surgeons; and instances have occurred in which the bodies of individuals in a state of intoxication, or apoplexy, have been entirely consumed in a few hours. The same thing has happened to infants incapable of extricating themselves from the flames. Dupuytren arranges with burns produced by flame, those caused by the combustion of hydrogen gas, and by the explosion of gunpowder. In general, gases cause only superficial, but at the same time very extensive burns, because they act instantly upon large surfaces. Burns of this description, however, sometimes penetrate through the cutis. The degree of a burn is according to the nature and density of the ignited or heated substances.
which are immediately applied to the living textures, their capacity for caloric, and the facility with which they relinquish it. Thus, all boiling fluids do not burn with the same force, because they do not all boil at the same temperature. Hence, the burning action of fatty substances, as soup, oil, lard, &c., is more energetic than that of water. But as Dupuytren justly adds, another cause of this difference depends upon the former adhering to the skin, while water merely runs over it. Solid bodies, when their combustion is rapid, like that of phosphorus, sulphur, and resinous substances in general, occasion deep burns. In the contrary case, the intensity of their effects is determined by their degree of heat, the duration of their application, and the tissues being more or less susceptible of the impression. Caeteris paribus, a burn is less deep when it takes place on parts habitually exposed to the air, than when it occurs on parts always covered with clothes, and whose cuticle is very thin.

In all burns, then, the quantity of injury depends on the degree of heat in the burning substance, on the duration and extent of its application, and on the sensibility of the burnt parts.

By Fabricius Hildanus, Boyer, and Dr. J. Thomson, burns are divided into several kinds or degrees:—1st. Into such as produce an inflammation of the cutaneous texture, but an inflammation which, if it be not improperly treated, almost always manifests a tendency to resolution. 2dly. Into those which occasion the separation of the cuticle, and produce suppuration on the surface of the skin. 3dly. Into others, in which the vitality and organization of a greater or less portion of the cutis are either immediately or subsequently destroyed, and a soft slough or hard eschar is produced.

Suppuration is not always an unavoidable consequence of vesications in burns: but it is a common and a troublesome one.

“ In severe cases, it may take place by the second or third day; often not till a later period. It often occurs without any appearance of ulceration, continues for a longer or shorter time, and is at last stopped by the formation of a new cuticle. In other in-
stances, small ulcerations appear on the surface or edges of the burn. These, spreading, form extensive sores, which are in general long in healing, even where the granulations which form upon them have a healthy appearance."

Heister and Callisen divide burns into four degrees, by adding to the preceding those which occasion, not merely suppuration on the surface of the cutis, but ulceration not necessarily accompanied or preceded by sloughing.

As Dupuytren observes in the above-mentioned classification of burns, attention is paid only to the intensity of the effects of the burn, considered generally, while the nature of the organs which are the seat of them, the textures affected or destroyed, are entirely disregarded. Yet, it is manifest that heat acts first upon the skin, and that then its effects extend to variable and successively increasing depths. Dupuytren therefore preferred another classification, in which burns are divided into six degrees:—1. Erythema, or superficial phlogosis of the skin, without vesicles. 2. Inflammation of the skin, with detachment of the cuticle, and the formation of vesicles, filled with serosity. 3. Destruction of a part of the corpus papillare and rete mucosum. 4. Disorganization of the cutis completely down to the subcutaneous cellular tissue. 5. Conversion of all the superficial textures and the muscles into eschars to within a variable distance from the bones. 6. Carbonization of the whole thickness of the burnt part.

In the first degree of a burn, the parts are of a bright red colour, which is uncircumscribed, and like that of erysipelas, disappears for a moment after pressure with the finger, and the injury is attended with sharp pain. Frequently in a few hours, and always within a few days, the redness, heat, and pain cease, and the case terminates in desquamation, or a peeling off of the cuticle. However slight this degree of a burn may be, it is not unusual, when an extensive surface is implicated, for the pulse to rise and be accelerated, the tongue to be reddened, and symptoms of gastro-intestinal irritation to come on. When the head is the seat of the burn, the irritation is liable to be propagated to
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the brain, and then restlessness, delirium, convulsive twitches, coma, and even death may ensue.

The second degree of a burn is always owing to the action of more intense heat, or the longer continuance of its application. A sharp burning pain is felt, and sometimes at the same moment, but more frequently at the expiration of a few hours, one or several vesicles, filled with a clear transparent serosity, are formed upon the burnt surface. The pain is then accompanied by a sense of tension. The vesicles either burst or are pricked; the detached cuticle dries, and, in a few days, falls off in large pieces, or peels off in smaller ones, leaving the subjacent rete mucosum covered with new cuticle; yet reddish, thin, and delicate. Sometimes (to continue Dupuytren's admirable description) the cuticle, instead of forming vesicles, is torn in the first instance from the rete mucosum, which remains exposed. Most severe pain is the consequence of this incident, which is always followed by slight suppuration. But at length the denuded surface becomes dry, and soon merely a redness is left, which disappears, without leaving any vestige of the injury behind.

Dupuytren's third degree of burn essentially consists of a cauterization of the rete mucosum and of the papillary surface of the cutis. It is denoted by grey, yellow, or brown spots, which are thin, supple, and insensible, if gently touched, but more or less painful if greater pressure be made on them. The vesicles frequently arising over the points disorganized, in this degree, ordinarily contain a brownish milky serosity, or else a serosity highly tinged with blood; and this appearance is, at the very first, useful in the diagnosis. In these cases, sometimes the eschar is thrown off in a mass at the ordinary period; and, on other occasions, it falls off in fragments, so as to bring into view, in the places covered by the phlyctenæ, more or less extensive but superficial ulcerations, the cicatrices of which, though not complicated with cord-like fræna, will almost always remain conspicuous, on account of the white, dense, shining substance formed as a substitute for the destroyed surface of the cutaneous texture.
To this degree belong the majority of burns caused by gunpowder, and the eschars of which are blackened by the materials of which it is composed.

In whatever shape a burn of this degree may at first present itself, the pains, which had subsided at the end of twenty-four or forty-eight hours, return acutely; a preliminary inflammation occurs; the eschar becomes circumscribed, loosened and detached; and the whole soon heals, leaving a scar of a dead white colour.

This celebrated surgeon lays it down as a principle, that though the pain of all burns is acute, it is more intense, when only the surface of the skin is burnt, than when this texture is deeply destroyed; a fact of great importance in relation to the prognosis.

The following are the characters of a burn of the fourth degree, as described by Dupuytren. When an ignited substance is applied to the part for a considerable time, a sharp pain is the effect; but this ceases as soon as the cause of the burn is removed. The cuticle, rete mucosum, the whole thickness of the skin, and sometimes also a superficial layer of the subcutaneous cellular tissue, are struck by death, and converted into a deep, yellowish, or blackish dry mass, which is not at all sensible when touched, and harder and tenser in proportion as its colour is darker. The adjoining sound skin is wrinkled and pinched up, as it were; the radiating folds around the burnt part denoting the degree of shrivelling which this has undergone. In three or four days, the pain returns, and an inflammatory circle forms around the slough, which is generally loosened between the fifteenth and twentieth days. The bottom of the ulcer corresponds to the subcutaneous cellular tissue; the suppuration is very copious; and granulations rise up with vigour.

Burns of the fifth degree only differ from the preceding, by extending to parts more deeply situated, and they are liable to be followed by extremely alarming consequences. The eschars, which comprise aponeuroses, muscles, and tendons, and in the substance of which sometimes vessels and nerves are placed, which have resisted the action of the fire, are sonorous, black, brittle,
and depressed, and require a much longer time for their detachment. When they are soft, or occasioned by boiling fluids, they present a greyish insensible mass, which sinks under the finger, without any pain being excited. Suppuration is still more profuse, and the cicatrix, involving the muscles themselves, remains misshaped, and adherent, and the power of motion in the part is irremediably lost.

In Dupuytren's sixth degree of a burn, the whole thickness of the injured part is involved, and its surface is as black as charcoal, hard, sensible, sonorous when struck, and readily broken by any efforts made to bend it, and, after the detachment of the eschars, a more or less irregular stump is left.

Burns then present different appearances, according to the degree of violence with which the causes producing them have operated, and according to the kind of cause of which they are the effect. Burns which only irritate the surface of the skin are essentially different from those which destroy it; and these latter have a very different aspect from what others present, which have attacked parts more deeply situated, such as the muscles, tendons, ligaments, &c. Scalds, which are the effect of heated fluids, do not exactly resemble burns occasioned by the direct contact of hot metallic bodies, or a combustible substance on fire. As fluids are not capable of acquiring so high a temperature as many solids, scalds are generally less violent than burns in the injury which they produce; but, in consequence of liquids often flowing about with great rapidity, and being suddenly thrown in large quantities over the patient, scalds are frequently dangerous on account of their extent. The danger of a burn is not less proportionate to the size, than the degree and depth of the injury. A burn that is so violent as to kill parts at once, may not be in the least dangerous if not extensive; while a scald, which perhaps only reddens the skin, and raises the cuticle, may prove fatal if very large. The worst burns arise from explosions of gunpowder, or inflammable gases, from ladies'
dresses catching fire, and from the boiling over of hot fluids in laboratories, manufactories, &c.

In the slighter degrees of burns, vesicles form; but when the skin is at once destroyed, no vesicles make their appearance over the eschar. In some burns, the parts are killed at the moment of the injury; in others, they first inflame, and then mortify.

The extent of mischief it is often difficult to judge of, directly after the accident, notwithstanding the characters of the various degrees of organic injury are strongly marked; for, at the same time that the heat disorganizes the parts on which it acts with the greatest violence, it always affects the textures immediately below them; and though they may not be killed in the first instance, they may not be capable of bearing the subsequent inflammation, and afterwards mortify. Hence, as Dupuytren has remarked, the greater number of burns appear deeper and more extensive after the suppuration of the eschars than at first suspected; and the knowledge of this fact is of great importance in medical jurisprudence, with reference to burns of the third, and other severe degrees, inasmuch as the surgeon is cautioned by it not to pronounce an opinion concerning the degree of danger, until the sloughs have begun to loosen, and the extent of mischief to be settled.

In the various cases, the phenomena peculiar to each degree are not exclusively those which present themselves. In general, the effects of the different degrees of injury are blended together in the same burn. Thus, asDupuytren observes, from the point where the eschar is deepest, where it may even reach down to the bones, and involve the whole thickness of a part, it becomes gradually superficial, until at length it comprehends only the rete mucosum and cuticle.

The principal eschars are frequently surrounded by more superficial ones; and often between the disorganized parts, or in their vicinity, there are only vesicles of different sizes; and again, beyond these, or in the interspaces between the places of deepest
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mischief, there may be simply erythematous redness. Lastly, in many cases, all the several degrees of burn are exemplified in the different regions of the body.

Burns, according as they are of little or considerable extent, may be regarded either as purely local affections, or as injuries productive of such constitutional disturbance as may endanger life itself. The effects on the system at large may be the immediate result of a general shock, or (as Dupuytren terms it) irritation, caused by the action of caloric: or, they may be secondary, coming on during the stages of inflammatory reaction, suppuration, and hectic exhaustion, which often succeed one another in the progress of the case. Hence the division of the constitutional symptoms into primary and consecutive.

The mere sufferings, immediately occasioned by a burn, may prove instantaneously fatal, death taking place from excessive pain; at least such is the explanation of the fact given by Dupuytren, which, however, it is rather difficult to reconcile with his subsequent observation, that, in such cases, there is congestion of nearly every organ in the great cavities, which congestion, in relation to some important organs, especially the brain, one would expect, ought to have a share in occasioning the patient's death. Be this as it may, he found that the sudden fatality of burns was chiefly exemplified in children and nervous females, more rarely in adults, and still less frequently in old persons.

Supposing death, however, not to be produced thus suddenly, then excessive agitation, restlessness, spasms, convulsions, and intense fever sometimes ensue; while, in other instances, the patients sink into a state of stupor and prostration, the pulse being small and rapid, the skin cold and pale in parts of the body not touched by the fire, respiration slow, the limbs motionless and abandoned to their own weight, and questions unanswered, or replied to reluctantly and imperfectly. This kind of collapse may soon terminate either in death or in a general reaction.

If the burn is superficial, and does not exceed the second degree; if it is of moderate extent; and especially if the constitution
is peculiarly irritable, the formidable symptoms above specified are not observed, but a general reaction takes place, similar to what happens in erysipelas. The pulse becomes frequent and strong, the skin hot, the tongue dry and red, denoting irritation of the digestive organs, and there is thirst, nausea, or vomiting, loss of appetite, &c. In numerous cases of deep burns, amounting to the third and fourth degrees, no remarkable symptom occurs in the interval between the period of the accident and the time when the process for the detachment of the eschars commences. But at this crisis, which is usually about the fourth day, the inflammation excites pain, which is very acute when the burn happens to be in parts where the cutis is largely supplied with blood-vessels and nerves. When extensive surfaces are injured, all the above-mentioned symptoms of nervous and gastric irritation, which take place in a burn of the second degree, may present themselves, but in a far more intense form, and sometimes with such severity that they quickly prove fatal.

It has long been observed, that persons who die of severe burns, experience a remarkable difficulty of breathing, and oppression of the lungs. The common explanation of this fact was, that, as these organs and the skin are both concerned in separating a large quantity of water from the circulation, their participating in this function would account for respiration being often much affected when a large extent of skin is burnt. However, the kidneys perform the same office, and they are not particularly affected in burnt patients; so that the asthmatic symptoms, frequently noticed in cases of burns, are probably owing to some other cause. Dupuytren attributes them in the first instance to the impression made on the organs of the circulation and respiration, and then to the secondary development of intense bronchial irritation, or considerable pulmonary congestion.

If the patients have surmounted all the foregoing perils, others still await them; for, as Dupuytren observes, whenever burns are deep and extensive, and consequently leave, after the separation of the sloughs, ulcers of great size, the copiousness and long con-
tinuance of the suppuration frequently exhaust the strength, and by degrees bring on great emaciation. In burns, this stage of suppuration and exhaustion is characterized by the same symptoms, as accompany the latter stages of all chronic diseases.

Amongst the severe complications of burns, Dupuytren enumerates erysipelas, particularly phlegmonous erysipelas, which, if not checked, leads to gangrene of the cellular tissue, the production of large abscesses and sinuses, an extensively undermined state of the integuments, and excessively profuse suppuration; circumstances in which the amputation of the limb, now the only means of preserving life, offers but a doubtful chance of success.

According to the doctrines of Dupuytren, there are then four different periods or stages, in which the patient's life may be successively endangered in cases of severe burns:—

1. The stage of irritation, or, as I should say, the period of the first shock on the system.
2. The stage of inflammation.
3. The stage of suppuration.
4. The stage of exhaustion, or hectic.

The post mortem examinations of burnt patients, instituted by Dupuytren, tend to prove that, when the sufferer perishes in the flames, or a few instants after having been extricated from them, traces of excessive congestion are observable in the digestive tube, although there has not been sufficient time for inflammation to commence. Not only does the mucous membrane exhibit bright red patches of greater or less size—not only is it gorged with blood, but the cavity of the intestines contains a certain quantity of this fluid, which has passed into it by exhalation. The brain is largely injected with blood, and the serosity in its ventricles of a reddish tint, which is likewise frequently noticed in the serous fluid of the pericardium, pleura, and peritoneum. The mucous secretion of the bronchi is also bloody, and their investing membrane, at various points, of a bright red colour, and streaked with highly injected capillary vessels. It seems, in such cases, as if the blood, suddenly driven from the skin, made an effort to
escape through all the pores of internal surfaces. A boy, about fifteen years old, died in the North London Hospital in the winter of 1835-36, a few hours after the receipt of an extensive and deep burn. I took the opportunity of having the body carefully examined, in the expectation of finding the congestions of the mucous surfaces, and the bloody serosity in the ventricles of the brain, the chest, &c., specified by Dupuytren; but these effects were much less conspicuous than the observations of this distinguished surgeon led me and others to anticipate.

According to Dupuytren, when patients die between the third and eighth days after the accident, or in the second stage, in consequence of the violence of the inflammatory action, all the signs of gastro-enteritis will be found strongly marked, and ordinarily accompanied by inflammatory affections of the brain and lungs.

Lastly, if the patient has not sunk till a later period, or the stage of suppuration and exhaustion, the viscera, especially the intestines, are found much altered by the previous long-existing inflammation; the mucous coat is studded with patches of redness, and ulceration, and the mesenteric glands are generally enlarged.

In a child, three years old, who died in November, 1836, under my care in the North London Hospital, about a month after her admission, with several extensive burns of the fourth and fifth degrees, the post mortem examination revealed inflammation of the mucous membrane of the bowels in various places, and deposits of pus in the lungs.

The prognosis in burns is to be deduced from their extent, depth, and situation; the nature of the cause which has occasioned them; and the age and constitution of the patient. Strong, sanguineous, young subjects are more exposed than others to such bad symptoms as may originate from excessive inflammation. Burns of the head and trunk are more perilous than those of the limbs. Vesicles, redness, and burns of the third degree leave behind either no traces of them, or none which are very conspicuous. But burns of the fourth degree, which involve the whole thickness of the skin, if not properly treated, will give rise
to deformed cicatrices, and disadvantageous adhesions, especially when the eyelids, face, neck, hands, or feet, are amongst the injured parts. The reason of this is correctly ascribed by Dupuytren to the tendency of all ulcers in the integuments, and more particularly of such as result from burns, to contract, and diminish by the approximation of their margins to the central point. Thus, the fingers may be drawn towards the back of the carpus and confounded with it; the whole hand fixed against the fore-arm; the radio-carpal articulation dislocated; the foot variously twisted and constituting only a shapeless mass; the head forcibly drawn to the shoulders; the nape of the neck adherent to the back; the chin to the sternum; the ears to the adjacent portion of the scalp, &c.

In a burn of the fifth degree, the destruction of tendons and muscles deprives the limb of the power of executing its functions; the thickness of the disorganized tissues is followed by so copious a suppuration, that the patient is in danger of falling a victim to debility; and the exposure of the bones creates a risk of necrosis. A burn of this description may open the synovial membranes, and excite inflammation in them; and if the joint implicated be of considerable size, the most favourable issue can only be looked for in anchylosis or amputation.

In the limbs, a burn of the sixth degree renders amputation indispensable.

A burn of the first degree, if very extensive, often proves fatal immediately, or in a few hours after the accident. But, after twenty-four or forty-eight hours, resolution begins, and the danger is over. The same observations apply to a burn of the second degree; but it is attended with a greater chance of inflammation of internal organs, the tendency to which continues also for a longer time. In burns of the third degree, the patients are exposed not only to all the dangers accompanying burns of the first two degrees, but to others arising during the inflammation preliminary to the loosening of the eschars: first, to speedy death from the irritation, or shock on the system; to an immediate attack of gastro-enteritis; or of tetanus, spasms, and convulsions; or, in a later stage, to the same
consequences. When such a burn is so extensive as to affect two or three square feet of the skin, it generally proves fatal in the stage of detachment of the eschars, or that of suppuration. In a burn of the fourth degree, and above it, the pain and irritation only continue while the cause is operating; but the patients may perish immediately. If they yet live, sometimes they are plunged in a complete stupor; are seized with an icy coldness, and die in a few hours; while, in other instances, the system rallies, but the patients are cut off by the inflammatory reaction between the fifth and ninth day. Lastly, sometimes they are worn out and destroyed by the profuseness of the suppuration, the length of the disease, or an attack of hospital gangrene, or fever of bad type. Burns of the fifth degree, even though not very extensive, are unavoidably productive of considerable danger, on account of the inflammatory reaction, or febrile disturbance, which must ensue; and the danger is often very much augmented, by almost all the degrees of burns, which are usually noticed in the neighbourhood of a burn of the fifth degree.

Burns, implicating the conjunctiva, may cause ophthalmic and opacity of the cornea; or, if their effects reach more deeply, they may occasion a total disorganization of the eye.

In all ages burns have been objects of empiricism. Sovereign and specific remedies for them have been tried and lauded one after another in endless succession, each falling into oblivion to be succeeded by others of the same temporary and undeserved reputation. It seems as if nothing would ever open the eyes of those who search after infallible remedies for these peculiar injuries. The fact, that a burn presents itself in very different states and degrees, and that it is generally a complicated kind of injury, ought at once to render it plain to the most common understanding; that the various conditions and complications of burns must necessarily require great diversity in the treatment; which, as Dupuytren has explained, should be founded upon the following indications:—1. That of keeping down inflammation; and, in the two first degrees of a burn, assuaging pain and irritation, and pre-
venting the extension of effects to internal organs. 2. That of keeping within proper bounds the secondary inflammation, attending the separation of eschars, and the establishment of suppuration. 3. That of promoting the healing of the ulcers. 4. That of resisting the formation of fraena and adhesions, which would interfere with the motions of parts, or even completely destroy their functions. 5. That of relieving the primary constitutional symptoms, and also such consecutive ones as may occur.

In burns of the first degree, and in those of the second, unaccompanied by detachment of the cuticle, Dupuytren thought that every effort should be made to avert inflammation, and prevent the formation of vesicles or eschars. This doctrine, which I may say is the commonly received one of the present day, does not agree with the view which was adopted half a century ago by Mr. B. Bell, who did not approve of trying to prevent the formation of vesicles, since he always remarked, that there was less pain when these made their appearance, than when they were hindered from rising by the influence of cold or astringent applications. All applications, possessing slightly astringent sedative qualities, seem adapted to the fulfilment of this first indication. The part may be dipped in the diluted liquor plumbi acetatis, with a small quantity of alcohol or vinegar in it, or in ice-water, and kept for some time immersed. The late Sir James Earle was a zealous advocate for the use of cold water, or rather ice; but the method is one of great antiquity. "Cold is a remedy which has long been employed to diminish the inflammation of superficial burns. Rhazes directs, that in recent burns, cloths dipped in cold water, or in rose-water, cooled with snow, be applied as soon as possible to the parts which have been injured, and that these cloths be renewed from time to time; and Avicenna says, that this practice often prevents the formation of blisters." Sir James Earle's publication, however, had the good effect of drawing considerable attention to the subject, and of leading surgeons to try the method in a great number of instances in which other more hurtful modes of treatment might otherwise have been employed. The burnt parts
may either be plunged in cold water, or they may be covered with linen dipped in the same, and renewed as often as it acquires warmth from the part. The application should be continued as long as the heat and pain remain, which they will often do for many hours.

Some caution, however, in the application of cold becomes necessary, when a scald is of very large size, or situated upon the trunk of the body. In extensive burns, superficial as they may be, the patient is liable to be affected with cold shiverings; and these shiverings may be greatly aggravated by exposure, and by the application of cold. No doubt, therefore, in these examples, warm applications ought to be preferred.

With respect to the topical applications recommended by this gentleman, he generally prefers, in cases of superficial burns, cooling and refrigerant remedies. When there are vesications, and suppuration takes place without ulceration, he advises us, after refrigerants have ceased to produce beneficial effects, to use the linimentum aquae calcis. However, where the progress of cicatrization is slow, he recommends, instead of this liniment, ointments containing lead or zinc, particularly the ceratum calaminae.

When immersion is impracticable, linen, wetted with the above-mentioned applications, may be laid over the burnt parts, and frequently renewed; or, if the cuticle is unbroken, a solution of the sulphate of iron, or of subcarbonate of potassa, or ammonia, will produce very good effects. Dupuytren considered it always of importance to preserve the cuticle over a burn in an unbroken state; and, with this view, he particularly recommends the clothes over the injured part to be taken off with slowness and caution.

When vesications form, some surgeons are in favour of opening them immediately; while others assert that they should not be meddled with. Mr. B. Bell disapproved of opening them till the pain arising from the burn had entirely ceased. Then he thought that they should always be punctured; because when the serum remained a long while upon the subjacent skin, he found it likely to bring on ulceration. He was certainly right in expressing a
preference to small punctures; a practice which has the sanction of Dupuytren, who observes, that only a single prick of the vesicle with a needle, or the point of a lancet, should be made in its most depending part.

On the subject of opening vesications in burns, Dr. Thomson believes, that the diversity of opinion arises from the different effects resulting from the particular manner in which the opening is made. “If a portion of the cuticle be removed, so as to permit the air to come into contact with the inflamed surface of the cutis, pain, and a considerable degree of general irritation, will necessarily be induced; but if the vesications be opened cautiously with the point of a needle, so as to allow the serum to drain off slowly, without at the same time allowing the air to enter between the cuticle and cutis, the early opening of the vesications will not only not occasion pain, but will give considerable relief, by diminishing the state of tension with which the vesications are almost always, in a greater or less degree, accompanied. When opened in this manner, the vesications frequently fill again with serum; but the punctures may be repeated as often as is necessary, without any hazard of aggravating the inflammation. Great care should be taken, in every instance, to preserve the raised portion of cuticle as entire as possible,” &c.

When there is much irritation and fever, blood-letting, and such remedies as the particular symptoms demand, must be advised. On account of the pulse being frequently small, quick, and vibratory, bleeding is at present not often employed. As Dr. Thomson remarks, however, it may become necessary in patients of a strong robust constitution, in whom the symptomatic fever assumes an inflammatory type. He has often seen a single bleeding procure great relief in these cases; and he does not remember a case where bleeding was followed by injurious effects.

In burns, if the subject be young, vigorous, and full of blood, Dupuytren advocates local and general bleeding as contributing powerfully to tranquilize the system, and keep down inflammator-
tion. He also restricted the patient to low diet in proportion to
the severity of the injury.

When the pain and irritation are considerable, Dupuytren, like
the generality of surgeons, prescribes opium internally, and with
this he combines soothing anodyne applications. The stupor,
with which a patient so situated is frequently seized, is sometimes
alleged to receive more relief from opium than any thing else.

If, notwithstanding every care, inflammation come on, it is to
be moderated, and prevented from invading the uninjured textures,
and from attaining a degree in which it may either terminate in
gangrene, or produce formidable sympathetic effects on internal
organs. According to Dupuytren, therefore, now is the period for
having recourse to emollient fomentations and poultices, and to
local and general bleeding. If the pain be severe, anodynes should
also be prescribed.

The same indications seem to Dupuytren to present itself also
in burns of the third and fourth degrees, when the inflammatory
process for the detachment of the eschars commences. If the in-
flammation be too violent, it is to be checked; if the process of
separation be languid, it is to be roused. But Dupuytren cautions
surgeons never to forget, that, in this case, the employment of too
powerfully stimulating applications, or the continuance of them too
long, often brings on erysipelas which, originating at the edges of
the wound, may invade an extensive portion of the surface of the
body, and even prove fatal. Dupuytren affirms, that he generally
succeeded in stopping the progress of this kind of erysipelas by
laying a blister over the surface attacked.

But, in the foregoing stage of a burn, other things were insisted
upon by this eminent surgeon. One was to cover the burn with
fine soft linen, with many holes cut in it, and spread with the satur-
nine cerate, over which linen was laid a thin stratum of dry charpie
for the purpose of absorbing the pus. The detachment of eschars
he promoted with emollient poultices; and when they were com-
pletely loose, with the exception of a few filaments at the bottom
of the ulcer, these he divided with a pair of scissors as closely as possible to the eschars. Sometimes, when the eschar is deep, as in burns of the fourth and fifth degrees, pus collects under it, and its presence is denoted by fluctuation. In this circumstance, Dupuytren recommended incisions to be promptly made, to hinder the matter from extending into the adjacent cellular tissue. When, after the detachment of superficial eschars, or the separation of the cuticle constituting vesications, the exposed cutis was very painful, a cerate containing opium, or dressings wetted with an aqueous solution of the extract of opium, was the application to which Dupuytren gave the preference.

Another maxim, enjoined by Dupuytren, and which I consider one of the most important in relation to the treatment of burns, is that of changing the dressings quickly, so that the parts may be exposed to the air for as short a time as possible, and with the utmost tenderness. Hence, he used to uncover only a part of the ulcer at a time, and then dress it, before the other dressings were taken off. For this same reason, he considered the separate pieces of Scultetus's bandage more advantageous than a roller.

In extensive burns, and particularly those of the fourth and fifth degrees, the suppuration is generally so profuse, that Dupuytren deemed it necessary to change the dressings two, or even three times a day. But as patients thus circumstanced soon became dangerously reduced and debilitated, Dupuytren used to allow them a nutritious diet, and tonic medicines, especially quinine. The plan of dressing burns two or three times a day, appears to me rarely advisable; and I do not remember to have seen a single example, in which this frequent exposure and irritation of a burn would have been likely to have proved beneficial. The advice of Dupuytren on this point, I deem one of the few objectionable things in the view which he takes of the treatment of burns. In fact, some of the most approved methods of treating burns are founded upon the opposite principles of exposing injured parts as little as possible to the air, and of letting the applications remain a good while unchanged. The plans here alluded to, however, re-
press suppuration very considerably, and the discharge is less than in Dupuytren's treatment.

In the ulcerating state of suppurating burns, Dr. Thomson prefers emollient cataplasms. But, when the discharge continues, or becomes more profuse under the use of poultices, they are to be left off, and astringent washes employed, such as lime-water, the compound decoction of oak bark, a weak solution of sulphate of copper, &c.

Where the parts are destroyed and converted into sloughs, Dr. Thomson does not think it matters much whether vinegar, oily liniments, turpentine, spirits of wine, or emollient poultices be at first employed. He acknowledges, however, that the poultice is the remedy under the application of which the separation of the dead parts is most easily and agreeably accomplished. "The question," says he, "at present most deserving the attention of medical practitioners, with regard to the use of the warm emollient poultice in burns, is, whether we should apply it immediately after the burn has been received, or interpose for some hours, as has been so strongly recommended, dressings with vinegar, spirits of wine, or oil of turpentine. My own experience has not been sufficient to enable me to determine this point to my entire satisfaction. Yet I think it right to state to you, that in a number of trials made at different times, I have had occasion to see burns, to which common emollient poultices had been from the first applied, slough and granulate faster, and in a more kindly manner, than similar burns in the same persons, to which in some instances the Carron oil (lin. aq. calcis), and in others again oil of turpentine, were applied at the same time with the poultices."

In burns, attended with a more or less considerable destruction of textures, the cicatrices which follow are frequently deformed, and sometimes interfere seriously with the free motion of the parts on which they are situated, or even totally prevent the execution of some function. The plan, recommended by Dupuytren for the hindrance of these ill consequences, is to take care that the cica-trix may be of nearly the same extent as the destroyed skin, and
that it may not heal by the approximation of its margins to one another. The end may almost always be fulfilled by carefully applying the nitrate of silver to the granulations which are too high; by placing the limb in a proper position; and employing suitable dressings and splints. Thus, if the burn be situated over the flexor muscles, the limb should be kept extended; if over the extensor muscles, bent. Tents, tubes, or pieces of sponge, are to be kept in natural openings, which the healing process may tend to contract or close. Parts, like the fingers, which are disposed to grow together, are to be kept apart with lint or plaster. In the face, where the parts are so moveable and extensible, more or less deformity cannot always be prevented; but the best way of counte

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When the whole thickness of a limb is destroyed, amputation is proper, as substituting a simple wound, the cure of which will be easy, for an eschar, or disorganized mass, the separation of which would be tedious, and followed by an irregular solution of continuity, and a projection of the bone, and other deep textures to which the action of the concentrated heat had least extended. Besides, as Dupuytren justly observes, the operation preserves the patient from the secondary inflammation which would otherwise take place, and not be free from peril. At the same time, before making a decision, the surgeon is to consider the age, constitution, and strength of the patient, and whether he is in a state to bear the process by which the dead parts are to be thrown off. If he were in a condition of stupor, or inflammation had already come on, with fever, &c., the subsidence of these effects, and the establishment of suppuration, must be awaited; after which, a decision for or against amputation should be made, according to the general state of the patient, or that of the ulcerated surface.
With regard to constitutional treatment, all surgeons agree with Dupuytren, that when a burn is slight, superficial, of limited extent, and unattended with any disturbance of the economy, it requires no internal treatment. But, although superficial, if it cover a large surface, the patient should be at first restricted to low diet, take cooling diluent beverages, and be kept in a quiet cool room, remote from everything likely to disturb his mind or body. Dupuytren recommends the same plan to be followed in cases of deep burns. Acute pain is to be assuaged by means of large doses of opium; and fever and inflammatory symptoms are to be repressed by bleeding, especially in strong plethoric subjects; but, when the large size and the depth of the eschars justify the apprehension of the suppuration being extremely abundant, bleeding should be less insisted upon, because the loss of blood would render the patient incapable of bearing the suppuration, and likely to die of exhaustion. In such cases, Dupuytren confined his means for keeping down inflammation to diluents, low diet, and repose.

Suppuration having taken place, and the fever subsided, Dupuytren then ventured to allow his patients a small quantity of nourishing food. When the suppuration became very profuse, and lasted a considerable time, so as to threaten the patient with a dangerous degree of debility, he used to prescribe steel medicines and bark. When hectic symptoms and diarrhoea came on, he gave the patient, three or four times a day, a pill composed of half a grain of the extract of opium and one grain of sulphate of zinc. When inflammation invaded any of the visceræ, this affection was resisted by appropriate means.

Dupuytren made some particularly interesting observations on the cicatization of burns. In the first degree of a burn, there is, as already stated, no solution of continuity, and consequently no process like cicatization. The cure is by resolution. But, in the second degree, the cuticle being detached from the rete mucosum, it must fall off, and will require to be replaced. Here, the reparation, as Dupuytren explains, is affected in three ways, viz. without
suppuration, with a slight suppuration of short continuance, or with a long and copious suppuration. In many instances, when the cuticle forming the vesicle is not removed, but remains applied to the rete mucosum, after the discharge of the serosity, no suppuration whatever takes place. A new cuticle is produced immediately under the old one, with various quickness, sometimes in twenty-four hours, sometimes in two, three, four, five days, or even later. No vestiges of the burn are then left, but a more or less conspicuous redness, which disappears between the twelfth and thirtieth days, the skin resuming its natural colour. If the action of caloric has been more intense, or the cuticle has been removed, and the rete mucosum exposed, the surface of the skin will be attacked by inflammation, more or less acute. In some of these cases, after the discharge of serous fluid for a few days, an inconsiderable and short suppuration occurs, without any remarkable alteration of the rete mucosum. Here the result is nearly the same as that of the foregoing example; the suppurating surface drying up, and becoming covered with a delicate pellicle, the rudiment of the new cuticle, and all traces of the injury being obliterated. But, in many other instances, a profuse suppuration comes on, which, under neglect, or even sometimes under the most skilful treatment, continues a long while, and even occasionally for months. Under these circumstances, either the rete mucosum is completely destroyed, or the organization connected with it deeply impaired; while, in other examples, it is destroyed at some points, but saved, though altered at others. In the first case, the injury has reached to the cutis; the burn has attained the third degree, and the progress of cicatrization is the same as what will be presently explained as taking place in the latter. In the second case, the colouring matter usually becomes much deeper than in the natural state. Hence, those yellow, tawny, or brown stains, exhibited by the scars after the cure; stains, which are never effaced, and in which time scarcely ever causes any perceptible modification; and in the negro, the skin becomes even blacker than in the natural state. Lastly, in the third case, the surface of the cutis
granulates unequally at every point where the rete mucosum has been completely destroyed. The granulations are sometimes very exuberant, and hence irregular prominences, which continue under the new cuticle, and form more or less numerous columns, crossing one another in different directions. The cicatrix then exhibits an odd appearance; for the rete mucosum not being reproduced, or reproduced but very imperfectly, over the points where it has been destroyed, the columns or projections, resulting from such injury, are of a white colour; while the points of the skin, corresponding to those where the rete mucosum has been merely changed, are of a brownish tint.*

The foregoing views seem to Dupuytren to suggest certain principles in practice; viz. to keep down any inflammation likely to rise above the ordinary degree, by all suitable means, emollients, discutients, and even bleeding, if necessary; to refrain from employing irritating topical applications; to avoid removing the cuticle; to hinder suppuration from coming on; or, if it has taken place, to endeavour to stop it as quickly as possible. But if suppuration has already continued a good while, cannot be checked, and the rete mucosum is deeply altered, or destroyed, then Dupuytren is an advocate for destroying and levelling the granulations with frequent touches of the nitrate of silver, and for dressing the ulcer with fine linen spread with cerate, and having many apertures cut in it. Such astringents as are calculated to accelerate cicatrization are also to be applied, and even sheet lead, which, by its equable pressure, may be of considerable service. In this manner, Dupuytren found that a smooth flat cicatrix would be obtained, free from deformity. But all means commonly prove ineffectual for the dispersion of the diversified stains, of a tawny, yellow, or brown colour, occasioned by the alteration of the unde-

* If Breschet's views of the structure of the skin be correct, then, instead of referring these differences to the injured, uninjured, or destroyed state of the rete mucosum itself, we must ascribe them to the accidental condition of the minute glands, which are described by Breschet, as the sources of it, and to the state of the colouring apparatus.
stroyed rete mucosum, or rather of the minute glands which secrete it and the colouring matter.

As already mentioned, the third degree of a burn is characterized by the total destruction of the cuticle and rete mucosum, and by a considerable but not complete destruction of the whole thickness of the cutis. Hence, in this case, there is no reproduction of a complete cutaneous texture, as in a burn of the fourth degree. A layer of skin is yet left, and it is from it that other new and more superficial layers are derived. After the detachment of the eschar, comprising the rete mucosum, and a portion of the thickness of the skin, numerous small red points present themselves on the surface of the ulcer, which exhibits a whitish ground. According to Dupuytren, this is nothing more than the undestroyed portion of the cutis, which soon becomes entirely concealed by the increasing number of red points, and then the ulcer is of one uniform redness. These red points or granulations, by their progressive development, gradually fill up the chasm left by the separation of the eschar.

It is another remark made by Dupuytren, that however instantaneous the action of the caloric may be, it never extends its effects to precisely the same depth at every point. This is a fact, exemplified in every kind of burn. In burns of the third degree, in some places the rete mucosum alone is destroyed, and the cutis is but very slightly injured; whilst, in other situations, this is more deeply involved, without, however, being completely burnt through. This irregularity in the depth of the injury refers to the inequalities so often noticed in the granulations, and terminating, where cicatrization is left to itself, in an uneven rugged scar.

In cases of the third degree, Dupuytren considers all those therapeutic means proper which have been specified or called for by burns of the second degree. If the inflammation is too intense, or the suppuration so copious and protracted, as to threaten a complete destruction of the cutis, they are to be diminished. Cicatrization is to be quickened by appropriate means. Adhesions of parts to one another, and the obliteration of natural openings,
are to be prevented by expedients which will be presently described.

For the correction of the exuberance and irregularity of the granulations, Dupuytren recommends the nitrate of silver to be frequently employed. He also preferred dressings which prevented the pus from lying long upon the ulcer. Hence, his custom of covering the whole surface with fine old linen spread with cerate, and full of numerous apertures; of putting over this a layer of dry charpie, and of covering the whole, not with a common roller, but with separate pieces of bandage. Thus the pus, which passed through the perforated linen, was absorbed by the charpie, and, if it was very profuse, it made its escape in the interspaces of the pieces of the bandage.

After a more or less prolonged suppuration, the cellular and vascular granulations are described by Dupuytren as gradually assuming a firmer consistence and more fibrous character; and the cuticle is deposited over them, which is at first exceedingly fine, and under which the rete mucosum is organized, of a bright red colour, irritable, prone to congestion, and often the seat of erysipelas. The existence of the rete mucosum, though in an imperfect state, and, in most cases, destitute of its colouring matter, was considered by Dupuytren an indisputable fact. Thus, according to his researches, the cicatrix of a burn of this degree is white in the negro, and whiter in the European, than the common skin. In some cases, however, he believed that the pigmentum was entirely or partly reproduced, and imparted to the skin a more or less dark colour. The rete mucosum, when entirely a new formation, seemed to Dupuytren always to be imperfect, and never to resume its original colour: hence irremediable disfigurement.

In the fourth degree of a burn, the whole thickness of the skin is burnt through and destroyed, but the subcutaneous cellular tissue, though exposed, is either not all, or but slightly injured. In this case, according to Dupuytren's investigations, cicatrization takes place in several ways. 1. After the detachment of the eschar, the edges of the ulcer insensibly approach one another, and
unite. 2. Or else the edges of the ulcer being retained in their respective situations, a new cutis is produced from the subcutaneous cellular tissue. 3. Or, lastly, both these processes are combined.

After the detachment of the eschar, the bottom of the ulcer is described by Dupuytren as formed by the cellular tissue; its margins exhibit a red circle, which is the rete mucosum, and under it, more deeply, a white circle, which is the cutis. The surface of the ulcer is reddish and granular: it diminishes from day to day; its swollen edges subside and approach one another; the surrounding skin yields, and is more or less displaced and dragged, according to the extent of the chasm. If this extent be too considerable, then, after the skin has yielded as far as possible, a new texture is produced, which serves as a substitute for those which were destroyed. On the contrary, if the edges of the ulcer can be made to meet, their union is accomplished after a suppuration of longer or shorter duration. Dupuytren further states, that this is what happens when the skin is not able to yield, or extend itself, and the parts are put into a position which allows the sides of the ulcer to be brought into contact. But if the approximation of the margins of the ulcer to one another is prevented, either by the unyielding nature of the parts, or by the interference of the surgeon, then a new tissue is generated, which is endued with very peculiar properties. This tissue, which is alleged by Dupuytren to be fibro-cellular, constitutes the cutis. As soon as it is formed, the new integuments are promptly completed; a rete mucosum, very imperfect indeed, and destitute of colouring matter, covers the cutis, and is itself quickly covered by cuticle, the qualities of which differ but little from those of the original.

Dupuytren concurs with Hunter in representing the formation of a new skin as a difficult task for nature: and this texture is always organized slowly, when the ulcer is of considerable extent; but when this has been accomplished, cicatrization is soon completed. Thus it is surprising to see an ulcer, which has continued
for months without any particular change, all on a sudden heal up in a few days.

Dupuytren enters into some very interesting reflections on the surgical plans which are to be adopted, in order to make the cicatrix correspond as accurately as possible to the destroyed textures. The first is, position of the limb or part. Here the general maxim is to let the position of the part be diametrically the reverse of what would promote the cure, by bringing the edges of the ulcer towards one another. The desideratum is to obtain a cicatrix, whose extent should be equal to that of the destroyed skin, and even somewhat greater, on account of the contractile property of the new texture. Thus, if the burn be on the front of the elbow, the arm is to be kept forcibly extended, until the substance of the cicatrix has been formed. The same plan is applicable to burns of the anterior part of the fingers, hand and wrist, groin, sole of the foot, ham, &c. Supposing the burn to be on the back of the neck, the chin is to be kept approximated to the chest; but, on the contrary, if the burn is on the fore part or side of the trunk, the opposite position is to be maintained. If the burn be on the front of the knee, or back of the elbow, the leg, or fore-arm, should be kept half bent, or, what is still better, in a state of complete and forced extension. When the armpit is burnt, the arm should be kept in the position of abduction; but, in that of adduction, when the top of the shoulder is the seat of the burn.

Dupuytren notices some circumstances, however, under which it is difficult, or impossible, for the foregoing principle to be acted upon in practice. Such is the case where the skin all round the member has been destroyed to some extent: by adopting one position, the advantages of another would be lost. Here Dupuytren advises a position to be selected which will leave a cicatrix that will interfere least with the free movements of the part. Thus, if the burn occupies the whole surface of the radio-carpal articulation, it is better to keep the wrist extended than bent, because the cicatrix, which would confine the joint in the first posture, would
be less inconvenient than one which would fix it in the second. In some of these perplexing cases, Dupuytren considers it advantageous to adopt different positions alternately, and to hasten cicatrization on one side, and retard it on the other.

Mr. Earle is of opinion that, by due attention to certain principles, the deformities from burns may generally be avoided. "I am quite ready to admit, (he observes,) that it is not in our power to arrest the law of nature, by which a cicatized surface becomes smaller, and occupies less space, than the original wound; but it is in our power, in most cases, to direct and modify that which we cannot wholly prevent; and thus, at all events, to counteract its injurious effect. We cannot prevent the process of absorption (of the granulations), but we can prevent its taking place in a direction which may interfere with the healthy functions of the part. To take the upper extremity as an example. I will suppose a case, where the whole integuments on the inner and front part of the arm and fore-arm have been destroyed. If such extremity be kept carefully extended on a splint, not only during the whole progress of healing, but long subsequent to the perfect cicatization, you will find that the cicatized surface will diminish in a circular direction, drawing the healthy integument together from side to side; but, that no contraction will take place in the long axis, in which alone it can impede the due motions of the limb. This permanent extension should be persevered in during the day and night, until all changes have ceased, and the cicatrix has contracted to its smallest dimensions. Care, however, should be taken, during this time, to give passive motion to the different joints, by which the proper secretion of synovia will be kept up, and the eventual free use of the limb will be insured. This plan of maintaining the limb in a state of permanent extension should be commenced as soon as the wound has begun to granulate."

Cases are noticed by Dupuytren, in which the plans calculated to produce a good cicatrix cannot be persevered in without danger; as, where the patient is likely to be exhausted by the long and profuse discharge. Here, instead of retarding the formation of

Means for preventing contractions.
the cicatrix, and compelling nature to fill up the chasm with a new texture, it is necessary to expedite it by favouring the approximation of the edges of the ulcer to one another, promoting the development of the tissues of union, or exciting inflammation when it is languid, and repressing it when it is too violent. But, in such cases, it is prudent to follow Dupuytren's advice in apprising the patient, or his friends, of the necessity for this plan, and of the deformity which will unavoidably follow it.

There are also certain regions of the body, specified by Dupuytren, where no advantage can be derived from position, and where it is exceedingly difficult to prevent deformity. Such, in particular, is the face. Thus, if a burn of the fourth degree were to destroy a portion of the lower eyelid and cheek, it would be impossible to hinder the edges of the ulcer from getting nearer together, and the eyelid would be drawn down until it almost formed a junction with the upper lip. If a similar burn were to occur on the forehead, temples, upper eyelid or scalp, an analogous deformity would be the result. Feeble as the means are which are within the surgeon's reach, when position is unavailing, they should never be neglected. Here, as Dupuytren explains, it is proper, 1. To retard as much as possible the detachment of the eschar, which, so long as it remains, has the effect of keeping the edges of the ulcer apart. The healing processes commence under it, and the margins of the chasm, becoming more fixed to the subjacent textures by inflammation, are less disposed to be drawn towards one another when the separation of the eschar does take place. 2. As soon as the latter event has occurred, cicatization is to be quickened, by frequently touching the ulcer with the nitrate of silver. Care is also to be taken to prevent any cicatrizing points in the centre, or at the circumference of the ulcer, from being destroyed, by the pus being suffered to continue too long in contact with them. Hence, Dupuytren was an advocate for frequently washing the part, and renewing the dressings.

Position, by means of which a good cicatrix has been obtained,
is recommended by Dupuytren to be continued a month, six weeks, or even longer, after the cure.

It is not only necessary to place the parts in the desirable position, but also to maintain it by means of a bandage, or apparatus. Thus, when the burn is situated on the anterior, posterior, or lateral part of the neck, the head is to be kept inclined in one direction or another, with straps or bands fastened to a bandage on the body. When the burn is on some part of the wrist, Dupuytren used to put along the fore-arm on the side furthest from the injury, a pad of a certain thickness, which descended to the joint without going beyond it. Over this he laid a splint of sufficient length to reach to the ends of the fingers, and then, availing himself of the vacancy between the hand and the splint, he kept the former inclined towards the latter with a few additional turns of the roller employed to fix the pad.

When the burn involved the palm of the hand, or passed between the fingers, Dupuytren used to place the pad along the back of the forearm, carpus and metacarpus, and then a splint terminating below in a hand-board, and long enough to cover the whole hand, even when the fingers were extended and widely separated from one another. The hand-board, at the points corresponding to the extremities of the fingers, had ten slits in it, intended for the reception of the ends of five pieces of tape, which formed so many nooses for the confinement of the fingers. Or the hand-board, instead of having fissures, was adapted to the shape of the hand, and furnished with prolongations for the fingers.

In burns of the second and third degrees, Dupuytren found that adhesion of contiguous parts might be prevented by keeping them apart by the interposition of some extraneous body, moving them about, and passing a probe between them at every time of dressing them; but that, when the burn was of the fourth degree, these means were not effectual. Thus he found it not enough to maintain the fingers separated and extended, but that it was es-
sential to make more or less pressure directly on the point where the cicatrix began. This pressure was made by means of a long narrow compress, the middle of which was applied precisely to the angle of the commissure of the fingers, while the two ends were carried over the front and back of the fore-arm, and there fastened. The same principle is applicable to other similar cases.

When a burn of the fourth degree implicated the circumference of natural orifices, as those of the nostrils, vagina, mouth, &c., Dupuytren used to prevent the obliteration of such apertures with dossils of lint, tents, cannulae, prepared sponge, ivory tubes, &c. Attention to this indication seemed to him here as proper as in burns with vesication, or those of the third degree: but, with these differences: 1. That they are even more rigorously indispensable. 2. That the diameter of the foreign bodies must always exceed that of the orifice into which they are introduced. 3. That their use must be continued long after the cure, in order to resist the contractile tendency of the cicatrix.

Amongst the means for fulfilling the indication under consideration, are straps of adhesive plaster. But Dupuytren correctly observes that, though they are very efficient when they are applied across an ulcer, in keeping its edges approximated, their action is but feeble when employed for maintaining them apart. Yet he admits that circumstances occur, in which they are of service. Such are burns of the face, forehead, temples, scalp, &c.; where the parts cannot be operated upon by position and other means.

In burns of the fifth and sixth degrees, implicating the muscles and tendons, a chief object is to keep the limb or part in such a position as will leave after the cure the least inconvenience. In general, as Dupuytren remarks, the disorganization is so considerable, that the preservation of the patient's life, by promoting cicatrization by every possible means, engages all the surgeon's attention, who has now no opportunity of thinking about the prevention of deformity, or the losses of functions resulting from it.
These deformities consist of inequalities, fleshy bands, fræna, adhesions, depressions, a puckering up of the part, and discolorations or stains of the skin.

With respect to the marbled or mottled discolorations left as consequences of exposure to moderate degrees of heat, the treatment recommended by Dupuytren consists in removing the exciting cause, and using astringent lotions, particularly those of the acetate of lead. He acknowledges, at the same time, that the plan is generally unavailing, and suspects that it would prove more successful, if combined with methodical compression. The slow and prolonged action of caloric here adverted to, he found to be not unfrequently the cause of varices.

The following are some examples of the various deformities, which Dupuytren had known to follow burns. In some patients, all the integuments at the base of the skull, and, with them, the ears and eyebrows, were strongly drawn upwards by a cicatrix, which had contracted itself towards the top of the head. In others, the eyebrow and upper eyelid were drawn up, and rendered immovable by a cicatrix on the forehead. In one, the eyelids were everted by scars on their fore part, or at the base of the orbit. In another, the commissures of the eyelids were drawn outwards or inwards by cicatrices on the temple, or root of the nose; or the ala of the nose was pulled upwards by a cicatrix above it, and the nostril obliterated. In others, again, the commissure of the lips was drawn upwards, outwards, or downwards, by cicatrices on various parts of the cheek; or the upper lip was united to the septum of the nose; or the lower one to the chin, so as to be incapable of preventing the escape of the saliva. In others, the ears adhered to the temples, and the meatus was contracted, or obstructed; or the chin, with its prominence effaced, was fixed to the front of the neck, or upper part of the chest; or the skin of the neck adhered to the thyroid cartilage or hyoid bone, whence a difficulty of swallowing, and an incurable enrouement. In other instances, the shoulder was drawn upwards, and the head to one side, by a cicatrix on the lateral part of the neck. In some girls,
in consequence of the horrible mutilation of the breast, the mammary glands could not be developed, or serve for the secretion of milk. In other cases seen by Dupuytren, the trunk was bent forwards, by bands extending from the front of the chest to the abdomen; or the shoulder was depressed towards the hip, and this pulled upwards by a cicatrix on the side of the trunk; or the elbow was fixed close to the side by a cicatrix in the axilla, resembling a kind of fin, when an attempt was made to lift the humerus from the side; or the forearm was held in the bent position by the effects of a cicatrix situated on the front of it, or the upper arm. In other instances, the wrist was bent or extended, or the fingers similarly affected were all united, and blended together in one mass, covered by the cicatrix. Dupuytren had seen the penis either fixed to the linea alba by a cicatrix which represented a sort of fold, like what prevails in quadrupeds, or else drawn to one side, and adherent to the scrotum, which had grown to the thighs. In one case, the thigh was fixed in the bent posture by a cicatrix in the groin, which cicatrix, though scarcely apparent when the limb was quiet, was converted into a very prominent band by the least movement of extension. Dupuytren had known the abdominal ring so weakened by a cicatrix in front of it, that a hernia took place, attended with the peculiarity, that the cicatrix formed such a projection when the limb was extended, that it prevented the patient from keeping up the bowels with a truss, until it had been divided. In other cases, he had seen the leg kept permanently bent by bands in the ham; or the feet twisted outwards or inwards, in consequence of burns on the sides of these parts, or the legs, which had occurred in early life; or the toes pointing straight upwards or downwards, sometimes with their dorsal surface directed towards the ground, so as entirely to incapacitate the patient from walking.

Mr. Earle has known the contraction of the cicatrix of a burn act with such force, as to bring the shoulders towards one another by a partial absorption of the clavicles. He mentions another
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case in which not only the whole head was bowed down towards the sternum, but the lower jaw bone curved downwards, so as only to admit of the last molar teeth coming in contact; the mouth being kept permanently open, and the direction of the incisor teeth so altered, that they projected nearly in a horizontal line. In a third case, the arm was pinioned to the side, and the hair and scalp drawn many inches down the back between the scapulae. Such, indeed, is the force adverted to, that dislocations may be produced by it. I have known instances of this with reference to the thumb and fingers; and Cruveilhier describes the particulars of a rare example, in which the carpus was luxated from the radius from the same cause.

However numerous or diversified the deformities from burns may be, Dupuytren considered all of them as admitting of being classed under a few heads. All of them consist either of cicatrices, which are too narrow, or too prominent; or in unnatural adhesions, or obliterations, or in losses of organs.

With respect to operations undertaken for the cure of deformities from burns, Dupuytren lays down the following principles:—

1. The attempt should never be made till several months, or even years, after the formation of the cicatrix. This rule, he says, cannot be deviated from, without the risk of incurring a great loss of substance produced by the destruction of the new-formed substance of the cicatrix. 2. An operation should never be practised, unless a larger and less deformed cicatrix than that which it is wished to correct, can certainly be obtained with the aid of position and bandages. This precept Dupuytren deemed specially applicable to cicatrices on the face, which in general should not be meddled with. 3. An operation should only be undertaken when it will restore the original shape and functions of the parts. Hence, it must be abstained from whenever ankylosis exists, or the muscles and tendons are destroyed. Occasionally, however, it may be performed for the removal of deformity, though the functions of the part cannot be restored by it.
But in what manner, and according to what rules, is the operation, if judged advisable, to be performed? Now Dupuytren does not admit, 1. That every operation which leaves the texture of the cicatrix subsisting, will be followed by a return of the contraction as before. 2. Or that, in order to attain success, it is absolutely necessary to cut away the cicatrix, and then bring the edges of the wound together, so as to unite them by the first intention. He found, that when the cicatrices had, after a length of time, acquired their complete solidity, and the fraena or bands had become perfectly organized, that the substance of the cicatrix is scarcely more disposed to contract than an original texture. Hence the rule which he lays down, that no surgical operation should ever be done until the cicatrices and adhesions have attained this perfect organization. When the object was to remedy too narrow a cicatrix, Dupuytren used, 1. To make, at various points of the fraenum, transverse incisions completely through it, so as to be able perfectly to extend it without removing any of its texture. 2. To extend the parts, and bring them into the opposite direction to that in which they had been drawn by the burn, and thus obtain a cicatrix by the production of a new cutaneous tissue. The requisite position was then maintained by means of bandages, machinery, &c. If the parts were supple and yielding, they were put at once into the right posture; in the opposite case, a slow and gradual extension of them was made, for which purpose Dupuytren conceived that splints furnished with elastic springs, so as to keep up a gentle but permanent effect, would be of great use. In this country splints with hinges, and allowing their angle of flexion to be regulated by a screw, are often employed. 3. The operation having been performed, the case seemed to Dupuytren to be nearly in the same condition as directly after the separation of the eschar. Hence his advice is, that the formation of the cicatrix should be regulated by the means already specified; and every effort made to hinder it from taking place by the approximation of the edges of the wound. If secondary fraena or bands
form, they are to be immediately cut through without sparing one of them. To the neglect of this precept, Dupuytren ascribes the failure of many operations.

If the removal of too prominent a cicatrix was the object, Dupuytren first sliced off the projecting part of it on a level with the skin; secondly, he kept the edges of the wound apart; thirdly, he frequently cauterized the surface so as to keep it rather below the level of the integuments.

Instead of slicing off the prominent cicatrix, Mr. Higginbottom rubs it with the nitrate of silver, exposes it to the air for three days, and then covers the part with ointment. The application is repeated as often as necessary.

If the deformity consisted in simple adhesions, Dupuytren's practice was as follows:—1. After having divided them, he dissected them freely to beyond their origin. 2. Then he drew the parts asunder. 3. Methodical and constant pressure was maintained on the point whence the cicatrix must proceed, which is always at the angle of union of the parts.

When the surfaces adherent to one another are extensive, as in cases of union of the arm to the trunk, or the two thighs together, Dupuytren cautions surgeons not to complete the operation at once, as dangerous consequences may follow so large a wound. The same rule is applicable to extensive callos prominences. Here it is best to proceed by fractions, and to let the wound of one operation be cured before another is undertaken. Another important caution, given by Dupuytren, is, to be certain, before any operation is attempted, that the limb, retained in a faulty position, is not incapable of being brought into a better one; if there were deformity of the articular surfaces, ankylosis, or atrophy of the limb, the division of the adhesions and contractions would be entirely useless.

Mr. Earle admits that, in recent cases, occurring in any of the extremities, and where the contraction is confined to the integuments, the division of it may remove the deformity for a time; but he maintains that when the contraction has been of longer
duration, the muscles acquire a new sphere of action, and afford an additional and powerful opposition to the free exercise of the limb. In some cases, he observes, even the bony fabric becomes moulded and altered by the powerful constriction exerted on it. In such circumstances, he regards transverse incisions and other severe operations as promising not even a prospect of temporary alleviation. Hence in a case which was under his care in 1813, he was induced, like Hildanus, to remove the whole of the diseased cicatrix, and to bring the healthy integuments together from the two sides of the arm, which was kept extended on a splint, not only during the healing of the wound, but for a considerable time after the new cicatrix had formed. Under such treatment, he conceived that the contraction would take place in a lateral direction, and not in the long axis of the limb. This case proved completely successful, as well as many others under Mr. Earle himself, Sir Benjamin Brodie, Mr. James, of Exeter, and Mr. Hodgson, of Birmingham.

Mr. James constructed an apparatus for keeping the chin elevated after operations for relieving contractions of the neck. This plan, with certain modifications, Mr. Earle has found answer, not only for curing but preventing such contractions. In slighter cases, a stiff soldier's collar, worn night and day, will be a sufficient protection against contraction, provided the skin directly below the chin be not burnt.

When Dupuytren had to deal with a contraction or obliteration of some natural opening, 1. It was enlarged, if only lessened; but perforated again, if obliterated, with a cutting instrument or trocar. 2. Dossils of lint, tents, or ivory tubes, much wider than the natural openings, were then introduced and kept in, not only until the cicatrix had formed, but for a long while afterwards.

For the prevention of the return of the contraction, Dupuytren strongly insisted on the necessity of persevering with the means calculated to resist it, until the cicatrix had lost this tendency by attaining its definitive organization; and, besides machinery, he
had recourse occasionally to warm-bathing, douches, emollient applications, and oily embrocations.

In America, one of the best applications for superficial burns is found to be raw cotton, thinly spread out, or carded, and put directly on the injured parts. According to Professor Gibson, it is only in superficial burns that this practice answers; but Dr. Anderson, of Glasgow, who has tried it on a large scale, represents it as applicable to injuries, whether occasioned by scalding or actual fire; whether superficial or deep, recent or old, vesicated or sphacelated. He states, that it has been long adopted by the inhabitants of the Greek islands. One of its advantages, he says, is, that, except in cases of deep injury, the cure is always accomplished without any appearance of cicatrization. Another is the avoidance of the pain always attending the frequent renewal of other kinds of dressings; for this is left unchanged a considerable time. Some care, says Dr. Anderson, is necessary, both in preparing and applying the cotton. For this purpose, it should be finely carded, and disposed in narrow fleeces, so thin as to be translucent; by which means it can be applied in successive layers, and is thus made to fill up and protect the most irregular surfaces. The burnt parts, if vesicated, are to be washed with tepid water, and the fluid evacuated by small punctures. Or, if more deeply scorched, they may be bathed with a spirituous or turpentine lotion. The cotton is then applied, layer after layer, until the whole surface is not only covered, but protected at every point, so that pressure and motion may give no uneasiness. On some parts it will adhere without a bandage, especially when there is much discharge; but, in general, a support of this kind is useful. Where the vesications have been broken, and the skin is abraded, or where there is sphacelus, more or less suppuration always ensues: and in such cases, Dr. Anderson admits, the discharge may be so great as soon to soak through the cotton, and become offensive, particularly in summer, so that it may be necessary to remove the soiled portions. This, however, he advises to be done as sparingly as possible, care being taken to avoid uncovering or
disturbing the tender surface. According to Dr. Anderson, there appears to be a twofold effect from this kind of treatment. The primary effect arises from the exclusion of the air, and the slowly conducting power of cotton, by which the heat of the part is retained, whilst a soft and uniformly elastic protection from pressure is afforded. The secondary effect, he says, depends entirely on the sheath, or case, formed by the cotton, absorbing the effused serum, or pus, and giving the best possible substitute for the lost cuticle. "But, in order that the full benefit may be derived from this substitute, and to ensure an equable and continued support to the tender parts, until the new skin is formed, it is absolutely necessary that the cotton should not be removed, except under particular circumstances, until the real cuticle is sufficiently formed to bear exposure." If much constitutional irritation be evinced after the cotton has been for some time applied, Dr. Anderson confesses that it may be necessary to let out the discharge, or even remove the cotton altogether. "We are then to be guided by the symptoms and appearances, whether to reapply the same dressings, or first restore a more healthy action in the constitution."

Mr. M'Intyre, of Newcastle, lately gave me a favourable account of his trials of this method.

Dr. Reese, of New York, the learned editor of the American edition of Cooper's Dictionary, admits, that "the exclusion of the air" is the true indication in the treatment of burns; but that it is imperfectly fulfilled by the carded cotton. "In superficial burns, salt has long been a domestic application, and can only act in this way; yet, when the part is completely covered with a layer of salt, the relief is immediate, and, in superficial burns, is permanent."

I believe that one of the most important principles in the treatment of burns, is to exclude them as much as possible from the air, and that it is in this way that the treatment with powdered chalk, the linimentum calcis, the linimentum terebinthine, flour, &c., proves very commonly advantageous. In particular, several of these applications supersede all occasion for an early or a fre-
quent removal of the dressing, and exposure of the part. When it is considered what agony is thus prevented, we cannot wonder that the simple application of flour should have come into extensive favour. In the North London Hospital, it is employed with great success, fresh flour being sprinkled with a dredger over the parts from day to day, at each point where matter shows itself in the stage of suppuration. When the flour is to be discontinued, the masses of it are covered with a poultice, which softens them, and makes their removal easy. Then the surgeon may have recourse to the same application, or others, according to circumstances.

The following passage, in relation to this subject, I find in Reese's American edition of Cooper's Dictionary:—"As the relief afforded in burns is generally the result of the exclusion of the air from the raw surface, the modern practice, introduced on the Continent, of covering burns with wheat flour, or other farinaceous material, will be found by far the most immediate in its action, and the most successful in its results; and this application is adapted to every species of burns, whether occasioned by scalding or actual fire; whether superficial or deep, recent or old, vesicated or sphacelated. In the most desperate burns, where the injury is extensive, and the destruction of the cutis almost universal, the patient is unable to sustain either the refrigerant treatment, or any modification of Dr. Kentish's plan. In these shocking cases, if the flour be applied all over the injured surface, until the air is entirely excluded, the pain is almost annihilated; and, from the most excruciating torture, the patient is instantly placed under circumstances of comparative comfort. The flour should be repeatedly applied, and persevered in, until the acute inflammation is removed, or, in common parlance, 'the fire is out.' No other application or dressing will be necessary till the acute stage is past; and then the plan of Dr. Kentish, modified according to the circumstances of the case, will be found adequate to the restoration of the injured surface, however extensive. I can confidently recommend this practice, having witnessed its success in the most hopeless cases."
Larrey's method of dressing burns with fine old linen, spread with saffron ointment, is probably useful also on the principle of excluding the air. He continues this application till suppuration has taken place, after which the styrax ointment is employed for promoting the detachment of the eschars. As soon as this has been accomplished, the saffron ointment is applied again, and subsequently dry lint, covered with strips of linen spread with cerate. When the granulations rise too much, he uses the nitrate of silver, and sometimes a weak solution of oxymuriate of mercury, or sulphate of copper. He also prescribes milk of almonds with nitrate of potassa; and allows his patients broth, jellies, eggs, &c.

NEURALGIA,

OR

TIC DOULOUREUX.

This is a most dreadfully painful affection of the nerves of the face, but of what nature it is difficult to say.

The pain is in general like the pain of electricity—patients will exclaim, "Oh, I had a shock at that moment." It produces a kind of flittering through the nerves; its motions are like summer lightning, and the pain cannot be compared to any thing more appropriate than the horrid sensations created by electric shocks.

This complaint usually occurs in the nerves of the face, more especially in the filaments of that branch of the fifth pair which comes out of the infra-orbitary foramen.

Sometimes it attacks other nerves. It is not continual, but occurs in violent paroxysms, which vary in duration in different instances.
Of the nature of tic douloureux, nothing, bearing any thing like conviction, can be named.

The nerves in this disease are not in an inflamed state, most certainly, for under the most horrid suffering they are found of a natural colour; they are not increased, but, on the contrary, are found to be rather diminished. Again, I think the disease to be one of diminished action rather than of increased; and it has been found that stimulating, exciting medicines, are more beneficial than those of an opposite character.

Then, as to the causes of this complaint, we are almost as entirely ignorant.

There are a few instances recorded, which appear to be the consequence of external violence, wounds, contusions, and so on. Mr. Abernethy is decidedly of opinion that tic douloureux is completely constitutional, arising from general irritability of the nervous system.

The best medical treatment you can adopt for cases of tic douloureux, is, probably, the administration of carbonate of iron; or, if this remedy fails, the use of other tonic and sedative medicines.

Stimulating embrocations, blisters, caustic, issues, fomentations, leeches, friction with mercurial ointment, electricity, opium in large doses, the arsenical solution, and a variety of antispasmodics, are the principal means which have been tried; but, for the most part, they only afford partial and temporary relief. Opium with sulphuric ether; extract of hyoscyamus, valerian, and peroxide of zinc; belladonna; sulphate of quinine; arsenious acid; and extract of stramonium; have also been recommended, and cases are recorded in which they have severally been useful.

If no impression can be made on the complaint by the use of medicines, will the division of the nerve effect a cure?

The division of the diseased branch will at least generally succeed in keeping off the pain for the space of three or four months; about which time it appears that the nerve re-unites, or that its branches anastomose with each other. In fact, it must be con-
fessed, that the operation has even failed in affording relief, much less of effecting a permanent cure.

As operations will afford even a temporary relief, you may probably be called upon to divide the trunk of the affected nerve, and to dissect out a portion of it, so as to give a chance of entirely cutting off the complaint.

But, before having recourse to an operation, you should be sure that the particular nerve which you are about to expose and divide, is really the principal seat of the disease; for, when all the nerves of the face generally are affected, or when the branches of the portio dura are especially concerned, there is little hope of success.

8. The nerves which most frequently require the operation are, the sub-orbitar, the supra-orbitar, and the sub-mental nerves.

If it should be deemed requisite to divide the sub-orbitar nerve, it should be done a quarter of an inch below the orbit: the nerve passes out through the foramen half an inch below, so that you are to divide it midway between the foramen and the edge of the orbit; if you divide it lower than this, you will leave some branches which will still continue the disease. The proper mode to be adopted for dividing it, is to introduce a sharp-pointed bistoury at the distance from the orbit already stated, and carrying the point of the instrument close upon the bone, you hook up the nerve on its edge, then press upon the skin over the edge with your finger, and at the same time withdraw the knife through the opening by which it entered; in this way, as you take out the knife, the nerve will be divided. You should ask the patient if he feels a numbness of the upper lip, and if he should not, your operation will be incomplete.

When necessary, the supra-orbitar branch is to be divided in a similar manner, by introducing the knife under the integuments of the superciliary ridge, and cutting through the nerve immediately as it emerges from the supra-orbitar foramen, by carrying the point of the knife from the nose outwards.

When the sub-mental nerve requires division, you need not make any incision through the integuments, but may perform the oper-
atation by placing the knife within the mouth, and directing its point downwards to the mental foramen, where the nerve passes out, and, by gliding the knife along the bone at that part, the nerve is sure to be divided. In performing this operation, you may direct your knife by the bicuspidati teeth, the anterior maxillary foramen being just below them.

* Neuralgia (derived from νιψον, a nerve, and ἄκης, pain) is a term signifying pain in a nerve, but first employed, I believe, by Chaussier, as the name of a class of diseases, the chief character of which is excruciating pain in the trunk or filaments of some particular nerve, or in the nerves of some part of the body, independent of any inflammation, or apparent disease in it. As Sir Benjamin Brodie remarks, the natural sensations of a part may be increased, diminished, or otherwise perverted, although no disease exists in it, which our senses are able to detect, either before or after death. There are, says he, other cases, in which the nerves of motion are affected, instead of those of sensation. Here there is involuntary contraction, or spasm of a particular set of muscles, or certain muscles lose their power of action altogether; and yet, after death, the most minute dissection will demonstrate nothing in them different from what would have been noticed, if no spasm nor paralysis had ever existed. These facts are not difficult of explanation. "Every part, to which a nervous filament can be traced, may be said to have its corresponding point in the brain, or spinal marrow, and an impression, made either at its origin, or anywhere in the course of the trunk of a nerve, will produce effects, which are rendered manifest where the nerve terminates, or at that extremity which is most remote from the brain." In every case of neuralgia, therefore, one important indication always presents itself, namely, that of inquiring whether there is any cause of irritation, affecting the trunk of the nerve, sufficient to account for the symptoms in the part to which its ultimate filaments are distributed. Thus, in one case, recorded by Sir Benjamin Brodie, the pressure of a femoral aneurism against some branches of the anterior

* Extract from Cooper's Surgical Dictionary.
crural nerve, which were kept on the stretch by the tumour, accounted for severe pain experienced at the inner side of the knee. In another case, a neuralgia in the course of the peroneal nerve during life, was discovered after death to depend on a tumour on the left side of the lumbar vertebrae, and extending into the pelvis, which had occasioned pressure on the origin of the sciatic nerve. Sometimes, as Sir Benjamin Brodie has likewise explained, similar effects take place, where the actual seat of disease is in the brain or spinal marrow. "Thus, (says he,) caries of the dorsal vertebrae, irritating the spinal marrow, produces pains and muscular spasms of the lower limbs; and the same disease, affecting the superior cervical vertebrae, produces corresponding symptoms in the upper limbs." A gentleman complained of severe pains, referred to one side of the abdomen. After having been fixed in one situation, they attacked another. No disease could be detected in the part apparently affected, and the pains were therefore regarded as nervous. It was observed, at the same time, that his powers of articulation were affected, and that he spoke in an indistinct and drawling manner. This seemed to indicate that there was some disease in the brain, and the suspicion was confirmed soon afterwards by the occurrence of epileptic fits, from which the patient continued to suffer during the few remaining years of his life."

In some instances, as the same interesting writer notices, the cause of irritation at first affects one portion of the brain, to which a certain function belongs, and then another, whose function is entirely different, and the symptoms vary accordingly. A gentleman laboured under severe pains in the left side of the face, a kind of tic douloureux. While under the influence of this pain, he was suddenly seized with a pain in the calf of the left leg, having precisely the character of that in the face. When the pain in the leg attacked him, that in the face abated, so as to cause little or no inconvenience; but, in a few days, when the pain quitted the leg, that of the face returned with its usual severity. Sir B. Brodie also refers to cases, in which certain neuralgic affections alternated with insanity.
Many nervous filaments of the testicle being derived from the renal plexus, will account for the severe pain in the testicle often experienced when a calculus is descending from the kidney down the ureter.

Sometimes, an impression made on one part of the body, will produce a nervous affection in a distant situation, where no explanation of the fact can be afforded on the principle of the trunk of the nerves supplying such part being compressed or irritated. Thus, a disease in the liver produces a pain in the right shoulder; a disease in the heart, pains in the back. Acidity of the stomach, or indigestible articles in it, have been known to cause pain in the foot, which subsided directly the cause was obviated. In one case, a similar symptom appeared to depend upon a stricture, and yielded as the latter gave way.

One remarkable feature of these neuralgic diseases, adverted to by the same experienced surgeon, is, that they seem to be suspended during sleep. A patient, suffering from the pains of *tic douloureux* in the face, may, for a time, be prevented from falling asleep; but, if once asleep, his sleep is likely to be sound for many hours. Even when the patient is awake, the pains usually have intermissions, and occur in paroxysms. The intervals of cessation, or abatement, vary in different cases from a few minutes to several hours, or even to several days. The pains in neuralgic affections are sometimes dull and wearying, but more frequently sharp, darting, or stabbing. Occasionally, they are periodical, and then as Sir B. Brodie notices, quinine and arsenic, which would cure the intermitting fever, will also cure the intermitting pain.

Neuralgia of the face, from being often attended with twitches of the small muscles of the part, has received the name of *tic douloureux*; which consists in severe attacks of pain, affecting the nerves of the face; most frequently, the filaments of that branch of the fifth pair, which comes out of the infra-orbitary foramen; but sometimes the other branches of the fifth pair, and occasionally the numerous filaments of the portio dura which are distributed upon the face. Some doubt its ever being felt in the
NEURALGIA.

Frequent affection of the fifth pair of nerves. "An hospital patient of ours complained of it not only in the cheek, but in the course of the portio dura from the stylo-mastoid foramen. We do not see why the disease should be confined to nerves of sensation. Two, or even all the three branches (of the fifth pair) are sometimes affected, and the pain may extend even to the other side of the face. We have known it extend down the neck to the shoulder, and all along the inside of the arm to the ends of all the fingers and the thumb. Various nerves of the legs, arms, fingers, or toes are occasionally the seat of the disease; and an intercostal, a lumbar, and even the spermatic nerve has been attacked. The pain may be confined to one nerve, or to it and its branches; may extend to other nerves in the neighbourhood or at a distance; or it may affect nerves at a distance from each other, simultaneously or successively, and change its seat backwards or forwards. The pain does not always shoot in the course of the nerve, but frequently in the opposite direction."

Neuralgic affections are more frequently met with in some parts than others. They are less common "in the viscera which are supplied by the great sympathetic nerve than other parts. Nervous pains are more severe, and perhaps, on the whole, more common in those parts which receive their nerves from the fifth pair, as the face, the eye, the tongue, than in any other individual part. Muscular spasms are common in the muscles of the neck, especially the sterno-cleidomastoideus. I am inclined to believe that they occur also more frequently in the upper limbs, than in the lower." Tic douloureux is not continual, but occurs in violent paroxysms, which vary in duration in different instances. It is the trismus dolorificus of Sauvages; the faciei morbus nervorum crucians of Dr. S. Fothergill; and of that order of diseases which Professor Chaussier has so aptly denominated neuralgies.

The first excellent description of tic douloureux was published in the year 1776, by the late Dr. Fothergill. It is not true, however, as is generally stated, that he was the first author who noticed the complaint. This, indeed, is so far from being correct, that we even find an account of an operation done long ago by
Louis, for the relief of the disease; and this identical case actually became a subject of hot dispute between the physicians and surgeons of the French metropolis.

Neuralgia was, in fact, first described at a still earlier period, namely, in 1756, by Andrè, in his work on diseases of the urethra. He met with it more frequently in women than men, but never in persons much under forty.

Tic douloureux conveniently admits of being divided into four species, called by the French frontal, sub-orbitary, and maxillary neuralgia, and the neuralgia of the facial nerve.

In the frontal neuralgia, the pain usually begins in the situation of the supra-orbitary foramen, extending at first along the branches and ramifications of the frontal nerve, distributed to the soft parts upon the cranium, and afterwards shooting in the direction of the trunk of the nerve towards the bottom of the orbit. In a more advanced stage, the conjunctiva and all the surface of the eye participate in the effects of the disorder, and become affected with chronic inflammation, which is described as a particular species of ophthalmia. At length, the pain passes beyond the distribution of the branches of the frontal nerve, and affects all the corresponding side of the face and head. It seems as if it extended itself to the facial, sub-orbitary, maxillary, and even to the temporal and occipital nerves, through the communications naturally existing between the filaments of all these organs. Each paroxysm produces a spasmotic contraction of the eyelids, and a copious effusion of tears.

The sub-orbitary neuralgia is first felt about the sub-orbitary foramen. The seat is probably in the nerve of this name, and the pain extends to the lower eyelid, the inner canthus of the eye, the muscles about the zygoma, the buccinator, cheek in general, ala of the nose, and the upper lip. At a later period, the pain appears to extend backward to the trunk of the nerve, and those branches which are given off in its passage through the sub-orbitary canal. Hence, pains are then experienced in the upper teeth, the zygomatic fossa, the palate, tongue, and within the
cavity of the nose. As the disorder advances, it may extend, like
other neuralgias of the face, to all the same side of the head.
During the paroxysms, when the disease is fully formed, an
abundant salivation usually takes place. In general, the attendant
toothache deceives the practitioner, who, in the belief that the pain
arises from another cause, uselessly extracts several of the teeth.

Tic douloureux of the lower jaw, or maxillary neuralgia, is
usually first felt about the situation of the anterior orifice of the
canalis mentalis, and it extends to the lower lip, chin, neck, teeth,
and temple. This form of the complaint is more uncommon than
the preceding; but, after it has prevailed some time, is equally
remarkable for its intensity.

With respect to the neuralgia of the facial nerve, or portio-
dura of the auditory nerve, it is a case, which very soon cannot
easily be distinguished from the other species of tic douloureux.
The pains at an early period are no longer confined to the passage
of the principal branches of this nerve between the parotid gland
and ramus of the jaw. The numerous communications of the
portio-dura with the rest of the nerves of the face seem to facili-
tate the extension of the disease, so that the agony is soon felt
over the whole side of the head. The original source of the dis-
order can only be detected by attentively considering the pro-
gress of the complaint in all its stages.

Tic douloureux may be known from rheumatism by the pa-
rozym being excited by the slightest touch, by the shortness of
its duration, and the extreme violence of the pain. In acute
rheumatism, also, there is fever, with redness, heat, and generally
some degree of swelling; and, in chronic rheumatism, the pain is
obtuse, long continued, and often increased at night; none of
which symptoms characterize tic douloureux.

It may easily be distinguished from hemicrania by the pain
exactly following the course of the branches of the affected nerve.

It is known from the toothach by the comparative shortness of
the paroxysms; the quickness of their succession; the intervals of
entire ease; the darting of the pain in the track of the particular
nerve affected; the more superficial and lancinating kind of pain; and the convulsive twitches, which sometimes accompany the complaint.

The causes of tic douloureux may be said to be in general unknown; though a few instances are recorded, which appear to have been the consequence of external violence, wounds, contusions, &c. It is mentioned in one of the journals, that distant irritations, especially of the splanchnic nerves, often produce this disease, and that Sir H. Halford has met with cases, where the discharge of portions of diseased bone, even from a distant part, has cured the complaint. Sir B. Brodie has seen one or two cases, which confirm this observation; but he entertains no doubt, that the disorder may arise from other causes; and adverts to instances of its seeming dependence on disease of the brain, or disorder of the digestive organs.

A modern writer has related an instance of a resembling disease in the arm, where the affection proceeded from the lodgment of a small bit of bullet in the radio-spiral nerve. Dr. Parry attributed the pain to increased vascularity, or determination of blood (perhaps amounting to inflammation) to the neurilema, or vascular membranous envelope of the nerves affected.

Sir A. Cooper states, however, in his lectures, that the nerves in this disease are certainly not in an inflamed state; for they are found of their natural colour, and rather diminished, than enlarged. The latter fact was ascertained in a dissection made by Mr. Thomas. An occasional thickening of the nerve is mentioned by Larrey, Delpech, &c.; but whether from conjecture, or actual observation, I am uncertain.

Stimulating embroacations, blisters, caustic issues, fomentations, leeches, friction with mercurial ointment, electricity, opium in large doses, the arsenical solution, and a variety of antispasmodic medicines, are the principal means which have been tried; but, for the most part, they only afford partial and temporary relief. Lasserre reported two cases, which were cured by bark joined with opium and sulphuric ether; and two other examples, which
yielded to pills, composed of the extract of hyoscyamus, valerian, and peroxide of zinc. Belladonna has often been tried, and often failed. Two cases in which it answered in doses of two grains, and two grains and a half, were published by Mr. Thompson of Whitehaven. Various neuralgic affections, in the practice of Mr. Cusack, have yielded to the exhibition of three grains of blue pill, combined with from three to seven of the pil. galbani comp., and given every second or third night, the bowels being regulated occasionally with a draught of infusion of quassia and sulphate of magnesia. M. Piedagnel cured a neuralgia of the infra-orbitary nerve with the sulphate of quinine, ten grains of which were blended with equal portions of orange-flower water and syrup, and taken in four doses, the medicine being continued afterwards in weaker doses for a short time. M. Dupré has also published various observations, representing the sulphate of quinine as a powerful remedy for neuralgia in its various forms. The testimony of Dr. Rabey is likewise in favour of its exhibition, and his opinion is backed by two cases in which he tried the medicine with success. Sir B. Brodie adverts to cases in which neuralgic affections assume an intermitting and periodical character. "According to my experience (says he), there is no part of the body, in which such pains may not occur, and when they occur daily, or on alternate days, they are always relieved by the exhibition of the sulphate of quinine, or of the cinchona combined with arsenic. But large doses of these medicines are sometimes required. A respectable medical practitioner consulted me, believing that he laboured under a disease of the spine. He complained of pain, which he referred to the inferior dorsal vertebrae, and which was so severe that he could scarcely endure it. On inquiring, I learned that the pain always attacked him at a particular period of the night; that it lasted for a certain number of hours; and that he was free from pain, or nearly so, in the intervals. I recommended that he should take the sulphate of quinine procured at Apothecaries' Hall. He took as much as fifteen or sixteen grains daily, without any decided amendment. I advised him to increase
the dose still further. At last, he took half a drachm of the sulphate of quinine daily, and this effected his cure." An example of violent frontal neuralgia yielded to pills, containing in each one-sixth of a grain of arsenious acid, made up with soap. This case was the consequence of an injury of the os frontis. From some facts, published by Dr. Marcet, the extract of stramonium, in doses of from one-eighth to half a grain thrice a day, seems to be sometimes capable of alleviating the distressing agony of the present disorder. The best anodynes for this disease appear also to Dr. Elliotson, to be the salts of morphia, stramonium, and belladonna, which, if carried to due extent, will sometimes alone cure. Colchicum is undoubtedly another valuable medicine. The veratria ointment, I have sometimes found give relief, but, in general, this has only proved temporary.

In 1820, the late Mr. B. Hutchinson published some cases tending to prove, that the subcarbonate of iron, in doses of $\frac{1}{3}$ j. or $\frac{1}{3}$ j. two or three times a day, is often an excellent remedy for tic douloureux. In fact, if the sulphate of quinine be excepted, this medicine at present possesses more reputation than any other, for its virtues in this complaint. It is highly commended by Sir A. Cooper in his lectures.

A convincing fact, in proof of the real efficacy of the subcarbonate of iron, is mentioned by Dr. Crawford: a severe case was benefited soon after its exhibition; but, by mistake, the carbonate of potass was then given for a few days, during which time the spasms returned with their usual violence and frequency: but when the iron was given again, the good effects formerly experienced from it returned. Dr. Elliotson observes, that the old dose of a drachm, or half a drachm, will sometimes succeed; but, while exhibiting this remedy in various diseases, he found that it might be given, without any inconvenience, in far larger quantities. Even children only eight years old will often take half an ounce or six drachms every four hours. If given in twice its weight of treacle, it rarely constipates. But strict attention should be paid to keep the bowels open during its employment, because, being an
insoluble substance and bulky, if it is not regularly discharged, its accumulation may be considerable, and prove an inconvenience. If doses of a drachm, every six hours, do not succeed, it should not be relinquished till larger ones fail. In all cases of neuralgia, whether exquisite or not, unaccompanied by inflammation, or evident exciting cause, iron seems to Dr. Elliotson the best remedy yet known, though he admits its frequent failure, or only temporary success.

The same experienced physician also expresses his opinion, that, when inflammation is obvious, or presumable, whether rheumatic or not, local bleeding, mercury, colchicum, and the whole antiphlogistic plan, general and local, are appropriate. Should these not succeed soon, anodynes may be added. When the complaint is rheumatic, yet not inflammatory, he sanctions stimulants external and internal, tonics, mercury, and counter-irritation. In addition to generous diet, he particularly commends the ammoniated tincture of guaiacum, of which a dose of half a drachm, or of six drachms, may be requisite every six, or every two hours, according to the effects. When there is debility, he prefers iron to quinine. The hot bath, of water or vapour, douches, electricity, blisters, moxa, sinapisms, tartarised antimony, croton oil, and acupuncture, he adds, frequently cure, if combined with all other appropriate means.

The tincture of iodine has occasionally proved beneficial.

The operation of dividing the trunk of the affected nerve, and even of dissecting out a portion of it, so as to prevent all chance of a relapse from the reunion of the ends of the nerve, is a plan which has sometimes been practised with permanent benefit. Thus, any one of the three branches of the fifth pair of nerves may be divided at the point, where it comes out upon the face. But, before having recourse to this means, the surgeon should be sure that the particular nerve, which he is about to expose and divide, is really the principal seat of the disease; for, when all the nerves of the face generally are affected, or when the branches of the portio-dura are especially concerned, there is little hope of success.
In fact, it must be confessed, that the operation has had many failures and relapses, either from the cases not having been duly discriminated, or from the neglect to remove a portion of the exposed nerve. Richerand, Delpech, and most of the leading surgeons in France, express their preference to the application of the moxa, or cautery, which, they say, proves more frequently successful than the knife. This should be done directly over the apertures from which the nerves emerge on the forehead, cheek, or chin; and Richerand asserts, that, by such treatment, the pains may always be cured, or at all events rendered supportable. Delpech also affirms, that the section of the nerve very often fails, and that issues, and the repeated use of the cautery, have been attended with the greatest success. The disfigurement of the countenance by burning applications must, however, be very objectionable; and as I think there is no positive evidence of the superiority of this method over the use of the knife, I consider what Richerand and Delpech have stated only as an instance of the extreme partiality of the French surgeons to the moxa and cauterization. Delpech confesses, however, that when the pains seem to be the consequence of a ganglion, or thickening of a part of a nerve, the excision of such part is indispensable. There can be little doubt, that this would have been more proper than amputation, in Mr. Denmark's case, to which I have already referred. The theories of Dr. Parry, senior, who was generally inclined to refer the effects of disease to increased determination of blood to the parts affected, led him to believe that the operation of cutting the nerve, as performed by Dr. Haighton and others, did good rather by the division of the arterial branch supplying the affected ramification of the trigeminus nerve, than by the division of that ramification itself.

There have been many examples of tic douloureux, which, after resisting all attempts to cure them, have been left to themselves, and after a long time spontaneously subsided. This author has seen the operation of dividing the chief branches of the portio-dura, in front of the parotid gland, undertaken, and
even a portion of the soft parts cut away; but without any favourable consequences.

When the infra-orbitary nerve is to be divided, Sir A. Cooper recommends it to be done a quarter of an inch below the orbit. The supra-orbitary nerve should be cut through just where it passes out of the supra-orbitary foramen. An instance, in which this measure produced an immediate alteration in the seat of the pain, may be read in the 8th No. of the Quarterly Journal of Foreign Medicine; but the cure was not complete, till the integuments had been divided from the root of the nose to the temple. The method of dividing the inferior maxillary nerve, advised by the same surgeon, is to cut down to the foramen mentale on the inside of the lip, directly under the bicuspid tooth. By the division of this nerve, M. Bouillard effectually cured one very severe case.

I have already stated, that the nerves of the extremities are subject to affections very analogous to tic doloureux. The following instance, related by Mr. Abernethy, will be found interesting:—

A lady became gradually affected with a painful state of the integuments under and adjoining to the inner edge of the nail of the ring-finger of the left hand. No injury to the part was remembered, which could have brought on this disease. The pain occurred at irregular intervals, and was extremely severe during the time of its continuance, which was for a day or two, when it usually abated. Accidental slight injuries always produced great pain, and frequently brought on the paroxysms, which, however, occasionally occurred spontaneously, or without any evident exciting cause. In all these particulars, the disease correctly resembled tic douloureux. As the pain increased, the disorder seemed to extend up the nerves of the arm. After the patient had endured this painful affliction for seven years, she submitted to have the skin, which was the original seat of the disorder, burnt with caustic. This application gave her intense pain, and on the healing of the wound, she found her sufferings
rather augmented than diminished by the experiment. After four more years of suffering, she consulted Mr. Abernethy, when the circumstances of the case were such as to render an operation indispensably necessary. The pain of the part was intolerable, and it extended all up the nerves of the arm; and this general pain was so constant during the night, as to deprive the patient of rest. The muscles of the back of the neck were occasionally affected with spasms. The integuments of the affected arm were much hotter than those of the opposite arm, and sometimes the temperature was so increased as to cause a burning sensation in them. Under these circumstances, Mr. Abernethy did not hesitate to divide the nerve of the finger, from which all this disorder seemed to originate. He laid it bare by a longitudinal incision of about three quarters of an inch in length, from the second joint of the finger, and divided it opposite to that joint, by a curved sharp-pointed bistoury, which was conveyed under it. He then took hold of the nerve with a pair of forceps, and reflecting it downwards, removed a portion of it, half an inch in length, so that the possibility of a quick reunion might be prevented. The wound was brought together with sticking plaster, and it united by adhesion; but the upper part of the wound, opposite to the upper end of the nerves, became slightly inflamed, and was very painful. However, in the course of three weeks, the appearance of inflammation gradually went off. After the operation, Mr. Abernethy pinched the originally affected integuments sharply with his nails, without causing any sensation; but if, in so doing, he moved the finger, then pain was felt.

The result was that, nine months after the operation, the general pains in the nerves had become very trivial; but the sensation in the integuments at the end of the finger had gradually increased, and the skin had now its natural sensibility, so as accurately to distinguish the tangible properties of any body applied to it. If also the originally affected part was slightly compressed, painful sensations, resembling those which formerly
occurred, took place. In a case resembling the former, but the consequence of a wound of the finger, Mr. Lawrence also cut down to the nerve and removed a portion of it, with permanent success. In a case of severe pain in the thumb, extending up the arm to the neck, and causing a distortion of the neck, fits, &c., Sir A. Cooper cut down upon the radial nerve, by the side of the flexor carpi radialis, and cut out about five-eighths of an inch of it. The result was a complete cure.

Dr. Mott has adopted the practice of dividing the nerve in almost every case of neuralgia, where it is practicable. He has repeated this operation on the infra-orbital, mental, and other nerves so frequently, and with so great success, that he confidently recommends it. He sometimes insulates a portion of the nerve by repeated incisions through it at small distances from each other, preferring this to a removal of a portion of the nerve. If these plans fail, Dr. Reese believes that the application of potassa fusa, or lapis infernalis, will almost always prove a remedy.

Notwithstanding the occasional success of the knife and caustics, I concur with Dr. Hosack, Sir B. Brodie, and others, in the opinion that many forms of neuralgia depend upon constitutional, or other causes, completely out of the reach of such expedients. "If the original disease operates immediately on the nerves of the affected part, (says Sir Benjamin Brodie,) producing in it pain, or muscular spasm, or paralysis, you will have first to consider how far it is within the reach of topical remedies. If a tumour presses on a nerve, or if some foreign body, as a musket-ball or a piece of dead bone, irritates its surface, or is entangled in its substance, perhaps the tumour, or the foreign body, may be removed by a surgical operation, or the tumour may be reduced by other means. If this cannot be accomplished, or if the nerve itself be altered in structure, either from disease or injury, it will become a matter for consideration whether the limb should be amputated, or whether the nerve should be divided. It is only under these circumstances that any advantage
can be expected to arise from the division of the nerve. In ordinary cases of neuralgia, where the disease on which it depends is in the brain, or in some other distant part of the body, or where it is connected with some derangement of the general health, it is evident that such an operation cannot be recommended on any sound principle; and it need be a matter of no surprise that, where it is performed, it should so generally fail.”

NEUROMA.

Neuroma, (from νεύρον, a nerve,) a term originally employed by Odier to signify a tumour formed in or upon a nervous trunk. This subject has been ably investigated by Mr. Wood, the results of whose researches are published in the Edinburgh Medico-Chirurgical Transactions*.

Tumours connected with nerves are subject to much variety. Sometimes, though rarely, the swelling consists almost entirely of a cyst, filled with a fluid, as exemplified in the case operated upon and reported by Cheselden. In other instances, it is in part solid and in part fluid; more frequently it is solid throughout. In one of the cases, detailed by Mr. Wood, the tumour consisted almost entirely of a firm membranous cyst, containing a thick fluid; in three others, it consisted partly of fluid, and partly of a solid substance; and in twenty it was entirely of a solid texture. The consistence, colour, and appearance of the solid part differ in different cases; and sometimes in different parts of the same tumour. In some instances, the whole mass is very firm and hard, of a whitish or yellowish colour, and of a fibro-cartilaginous appearance, harder than a nerve, and rather more shining. The fibres run generally in a longitudinal direction, but are not always parallel, and the interstices of them were observed by Mr. Wood to be filled up by the substance of the tumour. In other cases, one part of the

* Vol. III. Part II.
mass is solid, of a reddish colour, and steatomatous appearance; and in another part, there are cells of a larger or smaller size, some empty, others containing either fluid or a softish medullary substance. Occasionally small lobes are met with, all distinct, but closely pressed together. In almost all cases, Mr. Wood observed a firm sac, more or less dense, and of a shining appearance, not unlike tendon, and seemingly formed in part, or entirely, of diseased neurilema. In some cases, the sac is loosely attached to the contained parts by a thin cellular substance; in others, it is firmly incorporated with them; and sometimes it is attached to or partially covered with muscular fibres. The nerve itself is sometimes sound where it enters and comes out of the tumour; but more frequently it is thickened, and now and then reddened. The nerve may often be traced to the surface of the diseased part, and some of its fasciculi even into the substance, or sac of the tumour. When, however, the swelling is very large, none of the nervous fibres can be traced from the trunk above to that below the tumour. The circumstance of the disease affecting only a certain number of the fibres of the nerve, seems to Mr. Wood to account for the complete power of sensation and motion often retained in the limb beyond the tumour. That part of the nerve does continue adequate to its functions, when another part of it is much diseased, is proved by the effect of dividing the nervous trunk in the operation for the removal of the tumour, when the sensation and power of motion, which had previously been little impaired, became instantly destroyed, or much diminished.

The pressure of a neuroma may give rise to local pain and numbness, and, in some instances, it has been known to occasion convulsions and epilepsy. In a case recorded by Portal, a woman was freed from epileptic attacks by the removal of a tumour, which had formed on one of the nerves of the thumb.

The generality of neuromatous swellings do not seem to be of a cancerous nature; "first, because however large the diseased mass is, or however long it may have existed, the contiguous textures, and more particularly the skin, do not become affected
with disease of a malignant kind; and secondly, because there seems to be no tendency to a return of the complaint after it has once been removed by operation."

We know from the history of medullary cancer, however, and especially from the history of this disease, as it presents itself in the eye, that the nerves may be the seat of it. Now and then a neuroma is met with exhibiting a brainlike and bloody substance. Mr. Liston removed from a middle-aged and healthy-looking man a tumour, which had occupied the popliteal space for a considerable period. It was growing rapidly, had attained the size of a cricket-ball, and was seriously impeding the motions of the limb. On the dissection, the tibial nerve was found intimately connected with it, the fibrillæ stretched over its sheath entering into, and being mixed with the substance of the growth. The nerve was cut above and below, and the whole mass extirpated. During the stay of the man in the hospital, a tumour was detected on the front of the thigh of the same limb; here an inflammatory swelling took place, and suppurated. It was opened, but the original lump did not disperse. Within six months after the healing of the wound in the ham, the patient returned with an enormously swollen limb, and a large elastic morbid mass in the back part of it. A bleeding fungus protruded; and the disease was soon fatal. The original tumour, now in Mr. Liston's collection, is soft and bloody; but that on the fore part of the thigh was fibrinous, ovoid, larger than a hen's egg, and involved the anterior crural nerve. The diseased structure, which had been reproduced in the popliteal space, had all the characters of fungus hematodes. It seems extraordinary that, in this case, the removal of the tumour from the ham, with at least three inches of the tibial nerve, should not have been followed for an instant by any loss of power of motion or sensation in the limb or foot.

The following advice in relation to the treatment, as offered by Mr. Mayo, appears good. The tumour should be exposed, and if separable from the surface of the nerve, should be removed,
whether solid or a cyst. If completely implicated with the whole structure of the nerve, and that nerve a small one, it should be removed with the portion of nerve involved with it. "If so implicated, and the nerve the sciatic, and the tumour a cyst, the cyst might be punctured, and the fluid evacuated, every precaution being taken to unite the wound by adhesion. In the last case, supposing the tumour to prove solid, another question might still arise; whether, the nerve being first divided above the tumour, the latter would not admit of being dissected out of so palsied a limb, with more probability of safety to the patient, than if the nerve to be operated upon were left in communication with the brain."

An interesting account of the removal of a tumour of the radio-spiral nerve of the right arm has been published by Dr. Gibbs. The case terminated successfully, with a recovery of some slight use of the extensor muscles of the fingers; and "the patient was dismissed with returning sensation in the back of the hand, and a tolerably free use of the arm."

As is well known, when nerves have been divided in amputation, their extremities swell into firm bulbs of an oval shape, and frequently of the size of a nut. In certain instances, these enlargements of the ends of nerves cause most severe neuralgic sufferings, and this probably, as Mr. Lawrence conceives, either from the bulbous swellings of the nerves being involved in the cicatrix, or pressed by the contraction of it against the sawn end of the bone.

ON IMPOTENCE.

Although this affection has been arranged with the sequelæ of gonorrhœa, yet I consider it a point of importance for you to become acquainted with, and shall speak therefore of the causes
usually producing it. There are several causes which produce a destruction of the virile power. These may sometimes be traced to a peculiar sluggishness of constitution, to a general torpor of the procreative system, on which the usually attractive animal affinities exert no influence. To such persons a Venus might display her charms, and on such her son might exhaust his quiver in vain. No genial spring is here, no blooming summer or fruitful autumn, but all is winter—a dreary, desolate and barren winter—in which the springs of life are frozen up, and the animal propensities destroyed. Some men are so constituted that they may be said never to possess a venereal stimulus, and some of the other sex are equally frigid. I knew a person who remained unwarmed by the flame from the hymeneal altar for seven years, and who was incapable of performing the duties which devolved on him.

It is likely you may hereafter be consulted on these subjects; but these are some of the arcana of the profession into which you will not readily be admitted. No, it is not until you have contended long with popular prejudices that you will be made acquainted with such important secrets. When forty years of practice, or perhaps more, shall have rolled over you, when you shall have the snow on the tops of the mountains, (here the esteemed professor, with great good humour, passed his hand through the white locks which graced a front well formed,) then it is, and not till then, that you will be required to give your opinion on such weighty matters! When consulted on this point before marriage, you should ask, if they have any development of sexual power in the morning, and if they have, depend on it they will not be deficient in energy in the after part of the day. But if otherwise, advise them by no means to marry.

Another cause which might produce the calamity we are now considering is, an excessive irritability of the vesiculae seminales, which produces a premature expulsion of the seminal fluid; and this is almost as bad as the former cause. Sometimes it is the

Causes of impotence.

Hints to young practitioners.

Nervous excitability a cause.
result of debauchery, but most frequently it occurs in irritable and delicate young men; in such cases we have to support the constitution, by a generous diet and bark, giving at the same time opium to allay the irritability. In addition to which let the person stand over a large pan of cold water, and dash it over the genitals two or three times in the day. Turpentine and rhubarb are sometimes given, but I am not sure that they do any good.

Another cause of impotence is, the frequency of nocturnal emissions, and this is most commonly the case with young people. It is frequently the effect of bad habits at school, and it occasions a great degree of anxiety. We must try to lessen this by representing to the party, that it is an occurrence which frequently happens in persons in a state of health every nine days or a fortnight; although in the patient's case it may happen two or three times during the night. The treatment of this species will be very much as the preceding.

Sometimes it arises from a wasting of the testicle, or from an abscess of this gland producing absorption of its structure. The removal of one testicle does not destroy, neither does it seriously impair, the generative power. The removal of both, however, emasculates; there is an opinion to the contrary, but it is an erroneous one; this loss of power does not happen at once, the excretion of the semen continues for a short time, and the inclination and the power remain; but gradually the desire, and afterwards the power become extinct.

Impotence sometimes arises from the testicles not having descended. Mr. Hunter has said, that the testicles, when confined in the abdomen, do not exercise their functions. This is the case when the testicle is pressed upon by a congenital hernia when in the inguinal canal. But in the case of an apprentice of mine, who shot himself because his testicles had not descended, the secretory ducts were found full of semen. Impotence sometimes arises from the state of mind, generally from too great an impetuosity and eagerness to cohabit. A gentleman, for example,
is recently married, and if not able to perform his wishes in two or three days he is very full of anxiety, and the imbecility is considered by him to be permanent. When consulted by such a person you must not try to laugh him out of it, but tell him that it is not uncommon, but that it is necessary that he should promise you to abstain from the attempt for three or four days, or until he has taken all the pills which you will give him. These may be made of some harmless material. And that if he will observe what he has promised he is sure to get quite well. He takes two or three pills, but the very promise he has made, and the impression made on his mind by the promise, induces him to do the very contrary, and it seldom happens that he can return with any complaint.

Impotence and sterility are so intimately related, that they must necessarily be considered under one head, although disjoined by Good and some other nosologists. They are subjects of much greater practical importance than has been conceived by many, and often involve the happiness and perpetuation of families. Yet have they, by a sort of professional prudery, been either entirely overlooked by medical writers, or very imperfectly discussed, and thereby relinquished to the irregular practitioner, or to the entirely unqualified empiric. In the present era of high refinement, and of luxurious, if not vicious, enjoyments, and under the influence of noxious plans and systems of education, instances are very numerous, for which medical advice is required for the removal of the morbidly disqualifying conditions about to be considered, but is not resorted to so frequently as it ought to be. Since advice is thus often necessary, the ability of those from whom the community have a right to expect it of the most judicious kind, should be equally great in providing it. There is every reason, also, to believe that it would be oftener sought after, if the subject were known to be more fully entertained by the duly qualified members of the profession. The practical consideration only of these morbid conditions falls with-
in my plan; their legal relations are very ably discussed in the classical works of Paris, Beck, and Smith.

Impotence may exist in either sex, but most commonly in the male, owing to the sexual conformation. Sterility most frequently depends upon the female, although it sometimes is owing to the male; and, in a practical point of view, if not in a medico-legal one, it is more frequently thus owing, than is stated in books.

Impotence and sterility, in respect of both sexes, have been differently arranged by writers;—into absolute and relative; constitutional and local; direct and indirect; permanent and temporary; and by Dr. Beck into absolute, curable, and accidental. These distinctions are all of importance in the consideration of the subject; but the divisions founded on the nature of the causes are more useful. M. Raige Delorme has arranged impotence into—1. that depending upon lesions of the sexual organs; 2. that proceeding from disorder or interruption of seminal emission; and 3. that caused by defect of the faculty of erection. The division adopted by Dr. Beatty, into 1. organic; 2. functional; and 3. moral, although not materially different from the foregoing, is preferable to it. I shall consider the subject with reference first to the male, and secondly to the female; and view in succession the mental, the functional, and the organic states from which impotence and sterility most frequently proceed.

Impotence in the male may depend upon—1. mental influences or causes; 2. functional disorder; and 3. organic lesions of the sexual organs. 1st. Mental influences or causes may occasion temporary or more or less prolonged impotence, even in persons of a sound constitution in every respect. In them, the removal of the cause leaves the generative organs in a condition capable of performing their functions. The moral or mental influences which most frequently occasion impotence, are chiefly too eager, too violent, or over-excited desire, affections of the imagination,
and the depressing passions. Fear of incapacity, or of not being loved, timidity, shame, disgust, hatred, jealousy, surprise, terror, or any of the more violent mental emotions, most commonly have this effect. The first of these causes is, however, the most frequent; and the second,—the influence of the imagination,—the most powerful and permanent.

In former times, when superstition, and a belief in the power of magicians, of incantations, of sorcery and witchcraft, prevailed, the state of the imagination was often not only the cause, but also the cure of this affection; and, whilst incantations and other modes of impressing the mind were resorted to, for the purpose of destroying sexual power, amulets and charms were worn, not only for the purpose of guarding against their effects, but also for the restoration of this power, when lost or impaired. In the East and in Egypt, in Greece and in Rome, in uncivilized countries and in the seats of civilization, until a belief in witchcraft ceased, these means were daily resorted to, as well as others, which could operate only through the medium of the imagination. The bane and the antidote were both confided in, however obscure or impenetrable, or even absurd, either of them might have been. Montaigne was the first to penetrate and to expose the mystery of their operation. The twentieth chapter of the first book of his Essays will be read both with interest and instruction; and the thirty-Seventh chapter of the second book will be found not less profitable to the practitioner of the present day.

The generative function may be variously impaired, and by diversified causes. M. Virey remarks, with his accustomed desire of effect rather than of accuracy, that "the genital organs offer two states during life in the young and old, which are the frozen zones of existence, the intermediate period being the torrid zone of life. The child has nothing to give, the old has lost all." Instances, however, occasionally occur of genital precocity; and those in which the function continues till a late period of life, are by no means infrequent. The generative function appears with puberty, and continues until the sixty-fifth year, or
even much later, unless impaired by excesses, or by local or constitutional disease. During, however, this long period, numerous circumstances tend to weaken or permanently to destroy it.

The constitution and energy of the parents are sometimes the cause of the imbecility of the offspring. Children from premature connexion, or of exhausted, aged, or worn-out persons, often inherit the incapacity of their parents, in respect both of the function in question, and of the system generally. Those who are thus hereditarily or constitutionally impotent, are of a leuco-phlegmatic or lymphatic temperament; their soft solids, especially the fibrous and muscular structures, are soft, lax, and weak; their forms are rounded, from the superabundance of cellular and adipose substance; their hair is soft and fine, and deficient on the face and pubes; their frames are delicate and feminine; their voices are shrill, clear, sharp, or weak; and their testes are small and soft, the cords and scrotum being soft, lax, and pendulous.

Functional impotence is most commonly caused by premature or excessive venereal indulgences, and especially by the pernicious crime of manustupratio. By these most injurious habits, the organs are excited to action before they are fully developed, and the seminal fluid excreted before it is duly elaborated. The muscles concerned in the generative function, and those also of the lower extremities, are either imperfectly formed, or have their energy remarkably impaired, so that they become susceptible, vacillating, and ultimately nearly paralysed. The imagination is morbidly acute or excitable, and erection imperfect, or frequent and momentary. The seminal and prostatic secretions are consequently weak, thin, clear, scanty, and serous; the whole frame, and particularly the nervous system, languishes, and becomes enfeebled by the too frequent discharge of a fluid essentially vital, partly recreementitious, and necessary to their support; and ultimately the testes emaciate, or become soft. The variety of impotence noticed by Dr. Paris, depending upon a want of consent between the male organs of generation; or that
in which erection takes place without discharge, or in which this latter occurs too quickly, and after imperfect erection; is most commonly the consequence of the causes just mentioned. But, in such, the evacuation consists chiefly of the prostatic fluid. General debility, from imperfect or unwholesome nourishment, may weaken the procreative energy, or render the desire less frequent, but it rarely destroys it altogether, or even for a time. Severe diseases, intense application to study, or to abstract inquirers or pursuits, have a still more remarkable effect in impairing, or temporarily destroying, the generative functions. In some instances, prolonged disuse of this function is followed by wasting of the testes, and, consequently, permanent impotence is the result. These organs, like others of the economy, are strengthened by moderate use, are weakened by abuse; their functions being often entirely lost by protracted disuse.

There are various other causes which may occasion functional impotence, particularly in certain constitutions; as the use of narcotics, especially of tobacco, hyoscyamus, cicuta, and opium. The sedative gases, particularly carbonic acid gas, may produce it. Various refrigerants, particularly carbonates of soda, camphor, and some cooling diuretics. The smell of camphor has long been considered as anaphrodisiac; and colchicum has certainly this effect, as noticed by Dr. Beatty. Soda water also exerts the same influence. The effects of these, however, are only temporary or partial. Injuries of the spine or spinal cord, or of the head, particularly the occiput; venaesection behind the ears; arteriotomy, &c.; have been considered causes of impotency. Of the influence of the first of these there can be no doubt. The use of mercury has been assigned as a cause; but it can hardly be viewed as such, unless carried to excess.

Organic lesions occasioning impotency are, diseases of the generative organs or of adjoining parts; malformations of these organs; and deficiency of one or more of them. Anaphrodisia from the first of these is often only temporary or relative; but from the second and third, it is generally absolute and per-
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The diseases which most frequently cause impotency are—firstly, those of the penis; secondly, of the testes; and thirdly, of adjoining parts. The penis may be so excessively irritated as to occasion a temporary impotence by obstructing the opening of the seminal ducts and the urethra. Much more frequently, however, complete or partial paralysis, or deficient energy of the nerves, and consequently of the muscular and vascular action of the organ, occurs, constituting the anaphrodisia paralytica of authors. This latter state is merely an aggravated form of functional impotence, and most commonly produced as above stated. A singular instance in which the cells of the corpora cavernosa were apparently disorganized or altered by inflammation and suppuration, so as to prevent the influx of blood, and consequent distention of the penis, and to occasion impotence, has been recorded by Mr. Callaway. A similar change to this may take place in one side of the organ, and have nearly the same effect upon its functions.

Various obstructions to the seminal discharge occasion temporary or permanent impotency. The chief of these are strictures of the urethra, and disease of the seminal ducts. Foderé adduces two cases, in which the powers of copulation existed, but without the seminal discharge. In one the ducts were obstructed by hard concretions; in the other, they were constricted and callous. As stated by Dr. Beatty, the opening of the conjoined ducts of the vesiculae seminales and vasa deferentia may be closed by scirrhous enlargement of the neck of the bladder, by enlargement of the prostate gland, by scirrhosity of the verumontanum, or by lesions of the duct itself. Strictures of the urethra can hardly be considered a cause of impotency, unless they are so extreme as not to permit the passage of a fine bougie. In the states of disease just mentioned, the inability of procreation arises from obstruction to the discharge of the seminal fluid, which is duly secreted; and when the obstruction is seated in the urethra, it may be removed by modern surgery. M. Foderé and Dr. Dunlop state that double scrotal hernia, by pressing upon the spermatic cords, sometimes
causes as complete emasculcation, as if the testes were entirely removed.

Impotency may also depend upon organic lesions of the testes—upon scirrhus, carcinoma, fungoid disease, or scrophula of these organs. But unless the whole structure of both organs be changed, the faculty of procreation may not be entirely or permanently lost. Uncommon smallness of these organs may occasion only temporary impotency; for this state may depend upon delayed evolution, or arise from the wasting consequent upon disuse. Mr. Wilson mentions the case of a person, twenty-six years of age, in whom the penis and testes remained of the same size as in childhood. He married at this age, and at twenty-eight, the organs had reached their natural size. When, with smallness, there are remarkable flaccidity and softness conjoined, impotency is much more complete and even permanent. In a case of this kind in a strong young man, some time under my care, no benefit resulted from treatment. Severe bruises of the testes may be followed by wasting or disorganization of them. Dr. J. G. Smith alludes to this mode of making eunuchs, and states that it sometimes failed. I believe that most of the instances in which impotency has been said to have been produced by riding, have been owing to bruises or injury of these organs, or to the pressure to which they have often been subjected. Wasting of the testes may, however, arise without any very obvious cause. In the extreme case in which I was consulted, I was unable to ascertain its source. It occurred in a most robust and muscular young man, who would not admit that he had ever had recourse to excessive or vicious indulgence, or that he had been unusually continent, until his inclination ceased with the decay of the organs. Foderé states that it was a common disease among the labourers in the canal at Arles; and Larrey, that it was not uncommon among the French troops on their return from Egypt. It has sometimes occurred as a consequence of the metastasis of *Cynanche parotidea* to the testes. Induration of these organs, independently of scirrhous disorganization, may be so great as to destroy their functions.
According to M. Andral, the seminiferous tubes are entirely obliterated, and the structure of the organ is hard, homogeneous, and without trace of organization in cases of extreme induration. Impotence from inflammation of the testes is only temporary.

The lesions of adjoining parts occasioning impotency, are chiefly, uncommon obesity, very large scrotal hernia, and hydrocele. Neither of them requires any remark. A varicose state of the spermatic veins may also have this effect, when it is very remarkable. But I am unacquainted with cases in which this cause has been assigned.

Malformations of the male genitals may occasion impotency. Great size of the penis is seldom, and smallness of the organ is perhaps never a cause of it, if the functions of the testes are duly performed. According to Zacchias, Foderé, Beatty, and others, excessive size, particularly excess in length, may produce relative or temporary impotence, by injuring the female organs. The chief malformations of the penis having this effect absolutely or permanently, are those in which the urethra terminates in the perineum; and even in these, impregnation may be accomplished by art. John Hunter was consulted in a case of this description, and was induced, by the experiments of Spallanzani, to recommend the patient to collect the seminal fluid emitted from the perineum during intercourse, and to inject it into the vagina. Impregnation took place, and a healthy child was born in nine months.

In cases where the urethra opens in a part of the penis admitting of being introduced within the vagina, impotency may exist, but it is only relative; for procreation may be effected when the opening is thus situated, whether it be on the dorsum, or on the inferior surface, as more frequently observed. Numerous instances are recorded by Simeons, Belloc, Kopp, Blundell, and Foderé, of impregnation by persons in whom these malformations existed. Mr. J. Hunter met with a case, in which the epididymis terminated in a cul-de-sac, instead of passing to a vas deferens. Dr. Beatty states, that a similar conformation sometimes exists in the vesiculæ seminales, where, instead of entering the urethra, they
Congenital deficiency of the penis is rarely observed, and complete deficiency, still more rarely. M. Fodère mentions a case in which the male organs existed from birth, but there was no vestige of the organ itself. The instances of congenital partial deficiency or malformation of the penis recorded by authors, the urinary organs being well formed, and the testes not imparied. In most of the cases more or less of the male organs occurred and the sexual desire was not impaired. In all these instances the formation of the excretory ducts of the testes exist both sides, though imparied necessarily results, but they are extremely rare.

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When they are not found in the scrotum, their entire absence can be inferred only from the history of the case, and from the state and appearances of the patient; for when they are altogether wanting, the usual characters of the male are partially lost, and those of the female assumed. As delay in the descent of the testes may arise from some imperfection, or delay of development, as J. Hunter reasonably infers, certain of the female characters may be presented, and yet these organs may exist nevertheless. The question then is, whether or not, the state of development, to which they may have attained, is sufficient for procreation. M. Marc adduces the case of a person of a feminine appearance, who yet possessed the full procreative power. The external characters cannot therefore always be confided in; but when all the external appearances of virility are present, although the testes are not found in the scrotum, there is every reason to infer that impotency does not exist; for numerous instances are on record proving that the mere retention of these organs within the abdominal ring does not affect the procreative power.

The congenital absence, destruction, or removal, of one testis is not a cause of impotency. It may however be a cause of relative incompetency, and even of complete impotence, if the remaining one be soft, small, or withered. Castration, or the removal of both testes, is followed by complete and permanent impotence, if it have been performed before puberty. But, subsequently to this period, the power of procreation may exist for a very short time after its performance, owing to the seminal fluid collected in the vesiculae seminales previously to the operation. M. Marc supposes that the time taken for the cure of the wound is sufficient for the absorption of this fluid into the circulation; but the cases adduced by M. Boyer and Sir A. Cooper prove that a temporary power exists or is retained until the vesiculae seminales are emptied. On this subject, the works of Paris and Beck will be consulted with advantage, for it hardly comes within the scope of this work.

A female may be impotent but not sterile, and she may be
sterile but not impotent; for, as respects the former condition, a state of the sexual organs may exist sufficient to prevent intercourse, and yet, upon its removal, impregnation may take place; and, as regards the latter condition, perfect competency to intercourse may exist, and yet conception may never occur. She may also be both impotent and sterile, or, in other words, were the impediment to due intercourse entirely removed, impregnation might not be effected. Sterility is very much more common than impotency in the female, and even than impotency in the male.

The causes of impotence in the female are an impervious state of the vagina, absence of this canal, remarkable constrictions of it, the division of it by a septum running downwards from a double uterus, adhesions of the sides of the vagina, or of the labia, and the termination of the passage abruptly in a cul-de-sac. An impervious vagina may arise from changes in the soft parts, consequent upon protracted inflammation or irritation, the passage becoming first constricted or remarkably contracted, and ultimately obliterated. In a case respecting which I was consulted, a recto-vaginal fistula, seated at the upper part of the vagina, had occasioned so remarkable a contraction of the vagina, that its canal was almost obliterated, its parietes having become callous and indurated. A similar result may also follow a vesico-vaginal fistula. Fodere believes, that malformations of the bones of the pelvis may be so great as to prevent intercourse, but this can hardly be the case. Exostoses, however, on the internal or inferior surface of the bones of the pubis may have this effect, but their occurrence in this situation, and to this extent, must be very rare. Congenital absence of the vagina has been met with by Villaume, Moulon, Syme, and Warren; and absence of both vagina and uterus by Mott, Davis, Macfarlane, and others. In a case adduced by Foderé, the uterus and vagina were found, upon dissection, to constitute one solid mass, without any cavity in either. In a child, examined after death by Hufeland, no trace of genital organs, peculiar to either sex, was found, externally or internally. Although such instances are rare, there is no doubt that one or more of the
different parts forming the female organs may be wanting. Congenital narrowness of this passage has been observed in a very few instances. In one or two of these, however, impregnation occurred, and the passage became enlarged in the progress of gestation. Contraction of the vagina was said to have existed in the celebrated Joan of Arc. The division of the canal by a septum has been met with in a very few cases only. Firm adhesions of the labia pudendi are not unfrequent in children, in consequence of neglected excoriation or inflammation. I have seen several instances of these adhesions of various extent, duration, and firmness. They are more rare in females after the age of puberty; but they have been met with at this age by Benevoli, Merriman, Ryan, Tucker, and others, and in some cases, they have been so complete, as nearly to prevent micturition. Inflammation or injuries, by instrument, or otherwise, during parturition, have been followed by adhesion of the sides of the vagina, and total obliteration of the canal. Several of the instances of obstruction by a strong membrane placed at the commencement, or in some part of the passage, recorded by Fabricius Hildanus, Ruysch, Ambrose Paré, Benevoli, Foderé, Physic, and others, may be imputed to adhesions long previously formed, which have subsequently assumed an organized and membranous state, rather than to an inordinately firm and resistant hymen. The hymen may, however, be thickened and hypertrophied, and be a cause of impotence by preventing intercourse. Yet impregnation may be effected nevertheless, as proved by numerous cases. This state of the membrane is therefore not productive of absolute impotence, even should it be allowed to continue; and it is not a permanent cause, as it may always be removed by an operation. Complete prolapsus or procidentia of the uterus, retroversion of the uterus, prolapsus of the vagina, cancer of the vagina or uterus, and extreme brevity of the vagina, are generally productive of impotency, although impregnation has occurred in rare instances, notwithstanding these lesions.

Absence of the uterus. Sterility may proceed from absence of the uterus, or of the
ovaria, or of both. When the uterus is wanting, the vagina is usually short. It may also proceed from a scirrhous or indurated state of this organ, from tumours in its substance, from polypi in its cavity, or attached to its neck, from occlusion of the Fallopian tubes, or adhesion of their fimbriated extremities to adjoining parts, from narrowness or entire obstruction of the os uteri, and from disease of both ovaria. Several of these require further remark. Extreme constriction of the os uteri has been shown by Dr. Mackintosh to be productive of difficult, painful, or obstructed menstruation, and it most probably is also one of the causes of sterility. The mouth of the uterus may be completely obstructed by agglutination of its sides, or by a false membrane stretched across it, either internally or externally. The openings of the Fallopian tubes may be also closed by a membranous production, or by an albuminous exudation from the internal surface of the uterus. The tubes may be either partially or altogether obliterated, in consequence of the extension of inflammatory action to them, from the uterus or adjoining parts. When these alterations extend to both tubes, sterility must necessarily result. Although tumours developed in the body or neck of the uterus, and polypi attached to its internal surface, generally prevent impregnation, yet instances have occurred, in which conception has nevertheless taken place. These are, however, very rare, and abortion has always occurred during the early months. A tumour or polypus may be formed on the internal surface of the uterus, and yet after its removal, the patient may conceive and bear a child at the full time. A case illustrative of this has been recorded by Dr. Beatty.

The above causes are mostly productive of absolute or permanent sterility; but there are others, which are either relative, or admit of removal. These are chiefly, too profuse, or too frequent, and difficult menstruation, constant or profuse leucorrhea, inflammatory affections of the uterus, or of its appendages, dislike, disgust, and indifference on the part of the female, &c. Profuse or frequent menstruation is a more common cause of sterility than is generally supposed; this state, particularly when associated with
irritation of, or increased vascular determination to, the womb, preventing the retention of the ovum, until it has undergone the changes necessary to its attachment to the uterus. Leucorrhea is a cause of sterility chiefly when it depends upon inflammatory irritation of the internal surface or neck of the uterus, or when the secretion proceeds from relaxation of the vessels in this situation. When it is a consequence of inflammatory action, sterility may continue after the discharge has ceased, owing to organic changes in the surface of the uterus, or in the Fallopian tubes, especially the formation of a false membrane in the former, and the production of an albuminous exudation in the canals of the latter, or consequent obliteration of them. When barrenness depends upon leucorrhea proceeding from local relaxation, or general debility, it may be removed upon the disappearance of its cause. Delayed, retained, obstructed, or suppressed menstruation frequently occasions sterility. Some females have, however, conceived, who have never menstruated; and the mere suppression or obstruction of the catamenia may or may not prevent impregnation; various other contingent changes or concurring circumstances either favouring or preventing this result. Difficult menstruation is sometimes a cause of sterility, but its influence also will depend much upon other circumstances. That form, however, of dysmenorrhea, described by Dr. Duncan and Dr. Dewees, which appears to depend upon the formation of a membranous substance in the uterus, having a strong resemblance to the decidua, is very generally productive of barrenness; but this is only one of the several forms which subacute or chronic inflammation of the uterus assumes, either of which may occasion temporary or permanent sterility.

Temporary sterility. There are other causes of temporary or relative sterility. Among these the most common are too frequent yet inefficient sexual intercourse, too early marriages, general ill-health, and debility or exhaustion of the female organs owing to premature or too frequent excitement. Various circumstances connected with sterility in prostitutes have, perhaps, thrown some light upon certain of the causes of this state; and particularly the fact, that many of this
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class have had children after marriage, or after relinquishing promiscuous intercourse. Numerous instances have occurred of females who, having been obliged to marry contrary to their inclinations, have not conceived, and yet have had children from a second marriage. It is generally understood by females of all ranks in society, that indifference during intercourse, or suppression of the orgasm, will prevent impregnation; and, although they are sometimes deceived in this respect, yet their inference is correct in the majority. This is one of the principal causes of the sterility of prostitutes, other circumstances, however, besides those just alluded to, combining with it to produce this effect in them.

The treatment of impotence and sterility depends entirely upon the causes of either the one or the other, as far as they can be known. Many of these causes may be fully ascertained, and the consequences correctly anticipated; but as to the existence of others, inferences only can be drawn from a number of circumstances, and these inferences cannot be always fully confided in. Most of the organic lesions and deficiencies, enumerated above, cannot be remedied, yet a few of them may be assisted by art, either temporarily or permanently. But many of the functional and moral causes, and their effects, may be entirely removed. Absence of an organ or part essential to the function of generation in either sex is generally productive of impotence and sterility. Yet an imperfection only, and disease, of one or more of these organs, occasioning either inability in the male or barrenness in the female, may be remedied. Adhesions of the prepuce to the glans penis, phymosis, strictures of the urethra, fistulous openings in the course of the urethra, some of the diseases of adjoining parts that prevent intercourse, paralytic and debilitated states of the penis, and the slighter injuries of the testes, may be permanently removed, and their consequences disappear. Contractions of the vagina, and even constriction or narrowness of the os uteri, occlusion of the entrance of the vagina by adhesions of the labia, or by a morbidly dense hymen, or by a false membrane, prolapsus or procidentia of the uterus or vagina, uterine polypi, leucorrhea, difficult or painful
Moral and functional causes.

Menstruation, and inflammatory states of the uterus, may be severally remedied, and although sterility may not be always, it will be frequently, also removed.

Cases of impotence and sterility from moral and functional causes are the most common; and although they require the most scientific and judicious treatment, yet the mental, as well as the physical imbecility, that often characterizes them, brings them more frequently in the hands of pretenders and empirics, than in those of the qualified practitioner. The cases which proceed from these causes may be arranged into, 1st. Those which depend upon exhaustion; 2nd. Those which proceed from disuse, or from an imperfect exertion, of the function; and, 3rd. Those which arise from excessive mental and physical excitement, relatively to the susceptibility and sensibility of the nervous system. When impotency and sterility proceed from exhaustion, or from a premature decay of the generative functions, owing to premature unnatural, or excessive excitement, the treatment is nearly the same in both sexes, according as either may be chiefly or solely affected. In these cases the indications are, to restore—1st. The energies of the constitution; and 2nd. The functions of the procreative organs. To attempt the second, without either previously or contemporaneously fulfilling the first indication, will generally be futile, and often injurious. Persons, who are thus exhausted, sometimes perpetuate their infirmity by having recourse to noxious excitanths, and to the means advised by empirics. The scientific practitioner will be guided in the selection of remedies, by the causes, circumstances, and phenomena, connected with the case; and he will find it necessary to associate a moral or mental regimen with the physical means which may be required. When the affection depends upon an excited imagination, in connexion with a depraved habit, the former part of the treatment is the most necessary, but the most unpleasant for the physician to prescribe, and the most difficult for the patient to adopt. In these cases the mental weakness has advanced, pari passu, with the constitutional and local infirmity, until the mind has become incapable of exerting its more
reflecting and moral powers. It will, therefore, be often necessary to restore the energy of the nervous system by suitable diet, appropriate medicines, regimen, occupation, and change of air, before the moral part of the treatment will receive due attention from the patient.

In other and slighter cases, the debility is principally local, the general health, as well as the mental energies, remaining only partially or but little impaired. In these, the local, constitutional, and moral means of cure, will frequently prove successful, especially in the male. In this sex, when the inability depends chiefly upon weakness of the sexual muscles, invigorating modes of treatment, general and local, usually remove it, if its causes be avoided. In all these, attention to the digestive and secreting functions, vegetable or mineral tonics, especially the preparations of iron, and chalybeate mineral waters, the shower bath, or the cold salt-water bath with regular exercise in the open air, mental occupation, and early hours, will generally be most beneficial. Where the patient is subject to discharges from the urethra upon passing a stool, or on the excitement of sexual desire, a turgid and irritable state of the prostate gland may be inferred. When he is liable to frequent emissions during sleep, an irritable condition of the testes, and of the vesiculae seminales, obviously exists. In these, the more cooling tonics and the more astringent chalybeates may be employed, particularly the mineral acids, alone or with bitter infusions, and the tincture of the muriate of iron, aided by the regimen already stated. When the general and local astheniae are great, a moderate use of wine, of warm spices and aromatics, with as full and nutritious diet as the digestive organs can dispose of, will also be requisite. But the mental and local causes of sexual excitement should be avoided, so that the function should not be exerted beyond what may be necessary to restore and to fortify it.

When impotence in the male depends upon a too frequent exertion of the sexual function, the means of cure are sufficiently obvious. Yet the patient may be unable, from mental or nervous
weakness, to exert the control necessary for its cure. In such a case the usual restorative remedies should be prescribed, especially chalybeates and cold sea-water bathing. In most of these, the male organs are so irritable, that their functions are performed too rapidly and imperfectly, or before the organs, more or less necessary to procreation, can be excited in the female. At the same time, the male secretions are inadequate, particularly in respect of elaboration and retention in the vesiculae seminales, for the accomplishment of the purpose for which they are intended. This form of male impotence and sterility is commonly produced by masturbation, and is most benefited by whatever will improve the general health, and restore the tone of the sexual organs. Attempts at intercourse in these cases should not be more frequently than may strengthen or promote the function, without exhausting or weakening it.

The other states of functional impotence and sterility above alluded to, hardly require a particular notice, as they are temporary only, and soon disappear, as circumstances generally arise which soon remove their causes. It is, indeed, chiefly to the removal of the causes, that the attention of the physician should be directed, in the treatment of this complaint in both sexes.

In ancient times, and recently in some countries, both civilized and savage, the removal of impotency and sterility by the use of heating substances, supposed to possess aphrodisiac properties, was generally attempted. The prematurely aged, worn out debauchees, and the community generally, in some parts, especially in China, Japan, Africa, &c., often employ substances which are reputed to possess these properties. But the effects they produce, when they produce any, are more commonly injurious than beneficial. Musk, ambergris, cantharides, phosphorus, opium, the hot spices, aromatics, coffee, vanilla, borax, ginseng, castor, saffron, strychnine, extract of nux vomica, &c., are supposed to possess aphrodisiac virtues; and a diet consisting principally of fish or of shell-fish has a similar repute. Circumstances may arise in which it may be proper to prescribe certain of these,
as possessing stimulating and restorative properties; but others of them ought to be employed with extreme caution, particularly cantharides, phosphorus, and borax. The nostrums said to possess the virtues in question ought not to be resorted to. Certain articles of food, as pigeons, eggs, particularly raw or undressed eggs, caviare, herrings recently pickled, oysters, truffles, &c., may be employed as being at least harmless; but the less that heating medicines are prescribed the better, unless under certain circumstances, which may occur to require them; as in cases where the sexual function has not been restored after exhausting and depressing diseases, or after prolonged exertion of the mind on abstract subjects. I was very recently consulted by a gentleman about forty, who had no return of the sexual function after a severe attack of influenza a twelvemonth before. He had perfectly recovered from it in other respects for several months, and the remaining imperfection was a source of distress to him. In a case of this kind, the physician should at least know the means most likely to be of service, particularly as the inability may become a matter of family trouble, as well as of individual misery. Kämpfer states, that a combination of musk, ambergris, opium, and aromatics, in the form of small pills, are much employed by the Chinese and Japanese as an aphrodisiac; and I believe that it is not without some degree of efficacy. But it is very obvious, that the prolonged or too frequent recourse to these and similar substances is most injurious, both morally and physically.

The sterility of females must be treated with strict reference to the causes, as far as they may be ascertained or inferred. When it is chiefly functional, and induced by exhaustion, or by the noxious practices already alluded to, the means of cure are very nearly the same as have been here recommended, especially attention to the digestive and uterine functions, the use of chalybeates, or of chalybeate or other tonic mineral springs, with air, exercise, and early hours. For them also, the cold salt-water bath, the shower bath, or the salt-water douche on the loins, will also be
of great service. The importance of a due regulation of the mind, of healthy occupations, and of abstemiousness should be duly estimated.

POISONED WOUNDS.

In the treatment of poisoned wounds*, two indications present themselves:—

1. To endeavour to prevent the passage of the poison into the system.

2. To resist and lessen its operation on the constitution after it has entered the circulation.

For fulfilling the first indication, the following means are proposed:—

1. Excision of the bitten part, or destroying it with caustic. The bite of an adder, however, rarely produces effects severe enough to justify such proceedings, and, unless the excision were to go beyond the depth of the fang, it would be likely, as Sir D. Barry conceives, to do harm by exposing the mouths of larger vessels to atmospheric pressure.

2. The application of a ligature or tourniquet.

3. Suction. In Sir D. Barry's experiments, several dogs and rabbits were bitten by vipers. To the bites of some he applied cupping-glasses; to the bites of others he did nothing. Now, although the animals left to their fate did not ultimately perish, yet they were invariably attacked with convulsions and stupor, and the dogs with vomiting; whereas, when the cupping-glass was applied for half an hour to those which had been bitten by one, or even two or three vipers, they suffered no bad symptoms whatsoever, and exhibited no mark of constitutional poisoning. Sir D.

* Cooper's First Lines.
POISONED WOUNDS.

Barry is not an advocate for scarifications. The ligature, and simple washing of the part, and exclusion of it from the air, are the only measures which he approves of before the cupping-glass is applied; and even then only when suction, or the action of the cupping-glass cannot be immediately obtained. When a cupping-glass has been applied an hour, the contents of all the vessels will have taken a retrograde course; a stagnation of fluids will be the consequence, and the absorbent faculty of the cupped surface suspended. Thus, according to Sir David Barry, by letting the first cupping precede excision, we may remove some of the poison, and lessen the chance of the remainder being taken into the system.

4. The next proceeding is excision, which is to be followed by a second cupping. It may not, indeed, be necessary to employ excision at all for the bite of an adder. What I am now explaining relates rather to the severer descriptions of poisoned wounds, and especially to the best mode of preventing the fatal consequences of the bite of a rabid dog, cat, or fox.

5. In such cases, the part having been cupped, cut out, and cupped again, the cautery, or a powerful caustic, which will hermetically close the mouths of the vessels, may be employed, as advised by Sir David Barry.

6. Specific effects have been ascribed to certain local applications in rendering the poison inert; as, for instance, to olive oil, to the liq. ammoniae, and eau de luce. Their inefficacy, was, however, completely demonstrated in France, by Hunaud and Geoffroi.

With regard to constitutional treatment, ammonia and arsenic have the strongest evidence in their favour as internal medicines. L'eau de luce, once regarded as a specific, consists of ammonia with a small proportion of amber, and therefore resembles the spir. ammon. succinatus. Ammonia may act usefully in preventing syncope and depression of the vital powers, but is not a specific. Persons under the influence of the poison of serpents, or affected with hydrophobia, or tetanus, are capable of bearing extraordinary doses of this and other powerful medicines, such as
Poisoned wounds.

Opium and arsenic; which last has, perhaps, more evidence in its favour, as an antidote for the bites of snakes, than any other article. The doses of liq. arsenicalis, given every half hour, by Mr. Ireland, to soldiers in the West Indies, bitten by the coluber carinatus, contained one grain of arsenic. He combined with this treatment purgative clysters, and as soon as purging and griping commenced, the arsenic was discontinued.

Whether the bad consequences resulting from these injuries should be referred to the insertion of a poisonous matter in the part, or to the effect of the simple mechanical injury in particular states of the constitution, is a question yet unsettled. The common belief is, that such consequences, at all events, sometimes depend upon the introduction of a poisonous or deleterious principle into the wounded part, and this view I am disposed to deem correct, for the following reasons:—

1. If the severe effects, occasionally following cuts and punctures, received in dissection, were referable to the mere mechanical injury, how does it happen that they are noticed with such extraordinary frequency when the fingers or hands are wounded, and this sometimes in the slightest manner, in the examination of the bodies of persons who die of peritonitis, and especially of puerperal peritonitis? Why also should such effects be more common after pricks or cuts, met with in the opening of recent bodies, than of those which are more advanced in their decomposition? These circumstances are generally admitted to be facts, and, as they are mentioned as such by those who dispute the doctrine of poison, it is rather extraordinary that their direct tendency to prove the agency of a virus should have been overlooked by them in all their reasoning upon the subject. "Some dead animal substances," observes Dr. Macartney, "are more likely to communicate this dangerous disease than others. The brain, in the recently dead state, is extremely apt to produce it, even when no wound is received. The sero-purulent fluid, found in the large cavities after death (if no means of prevention be employed) seldom fails to infect persons, and the most dangerous animal fluid is that contained
in the cavity of the abdomen after puerperal peritonitis, or the serum found in parts which have suffered diffused or gangrenous inflammation. The white cancer of the liver, and the substance of medullary tumours, are found to be very irritating when merely applied to the hands, without a breach of surface.”

Practitioners differ widely about the right treatment. One party, believing in the presence of a virulent matter, advocate the plan of applying nitrate of silver, caustic potash, liquor ammoniac, nitric acid, or liquid muriate of antimony, to the puncture or cut, as soon as it begins to be troublesome; and, instead of antiphlogistic treatment, recommend a generous diet, tonics, wine, and other cordials, the bowels being merely regulated with aperient medicines.

Another party, doubting the existence and operation of any poison in the part, confide principally in antiphlogistic treatment, discharging the matter early, applying cold lotions, or poultices, to the part itself, with numerous leeches, and employing copious and repeated venesection, cold washes to the head, purgatives, and sometimes opium to tranquillize the excitement of the system. The advice, which has usually been offered by me to students, is, that the wound should be well sucked in the first instance, the nitrate of silver then applied to it, the hand covered with a cold evaporating lotion, and the limb kept quiet in a sling.

In the beginning, I believe, that antiphlogistic treatment should generally be preferred; but that when phlegmonous erysipelas, or diffuse inflammation of the cellular tissue, or abscesses, come on, the case should be treated according to rules explained in speaking of those disorders.

Dr. Macartney states, that, during the last fifteen years that he held the professorship of anatomy in the Dublin university, no severe disease occurred from wounds received in dissection, when the proper means of prevention had been employed. These consisted in immediately washing the wounded part, and afterwards keeping it wet for a few hours with a solution of alum in water.
The bite of a mad dog, or of certain other rabid animals, is the most dangerous kind of poisoned wound met with in this country, because it is apt to be followed by one of the most uncontrollable and rapidly fatal disorders to which human nature is liable.

All examples of hydrophobia admit of being divided into two classes:—first, those which cannot be ascribed to the bite of a rabid animal, or to the application of its saliva to a wound or an abraded surface; and, secondly, all cases which are produced either by the insertion of the saliva into a wound, or its application to an abraded surface.

The first class of hydrophobic diseases is not strictly within my province. I may mention, however, that it comprises symptomatic, and idiopathic or spontaneous cases; the first division being merely a nervous affection, accompanying certain inflammatory and febrile disorders, in which a considerable dread of water is occasionally manifested by the patient. As for the real existence of spontaneous or idiopathic hydrophobia, this is a subject of dispute, and I think there is ample room for doubting the correctness of the doctrine, since the histories of most of the persons, from whose cases the inference of the existence of such a disease is drawn, cannot be depended upon. They were, in short, generally drunken irregular characters, and in the habit of lying about the streets in the night-time. Now persons of this description might have been bitten by rabid dogs, or some abraded part of the skin might have been licked by dogs labouring under rabies, though not known to be indisposed; and hence no recollection of the circumstance might have been retained. Dogs, in the early stages of rabies, are seldom prevented from going about as usual, and are even domesticated in families, and fondled by children and others, whose hands and faces they are permitted to lick. Now, should there be a slight pimple, or abrasion of the skin, this custom might lead to the communication of hydrophobia. But, leaving the question about spontaneous hydrophobia to be settled by physicians, I proceed to the consideration of the form of the disorder, which originates from the introduction of a specific poison into a
wound, or its application to an abraded part of the skin, which poison is contained in the saliva of a rabid dog, cat, fox, or, as happens on the Continent, in that of a rabid wolf.

Dogs appear to be more susceptible of the disease than the human species: one rabid dog bit four persons and twelve dogs; none of the former were attacked with hydrophobia, although they underwent no particular treatment, and merely had recourse to common means, which daily experience proves to be unentitled to any confidence; but every one of the dogs became rabid. The term hydrophobia is scarcely applicable to the disease as it presents itself in dogs; for they can generally lap water without difficulty, and are sometimes very greedy of it, yet their doing so is generally fancied to amount to a satisfactory proof, that they are exempt from the disease. Now this is a serious mistake; for, as I have explained, they are for the most part fond of water, and lap it very eagerly. As for rabid wolves, when they are pursued, they will swim across wide and rapid rivers without the least hesitation or dread of water. Nor should it be imagined, that dogs are furious in the beginning of the disorder: at first they are merely somewhat irritable; afterwards they will bite other dogs, and even men, if they happen to be in their way; but they will not commonly turn out of their course to do so. Under the influence of the disease, in its early stage, the habits of a dog undergo a considerable change; thus he becomes fond of picking up small objects on the ground, and will even devour his own excrement; his voice is altered, the tone of his bark is quite different from what it is in the healthy state, being affected, indeed, as much as the voice of a cholera patient. The same circumstance is observed in other rabid animals, especially sheep. In some patients, such is the augmentation of sensibility on the surface of their bodies, that we cannot even touch their hair, without producing a violent convulsive agitation of the system. This fact was exemplified in one case seen by Magendie. The duration of the first stage is sometimes very short, and the form of it such as not always to raise a suspicion of the commencement of this terrible and fatal complaint.
Some patients are indisposed not more than a day or two, but others five or six days, previously to the second stage, which commences with a manifestation of a dread of liquids. The sight of water, or any attempt to drink fluids, now brings on violent convulsive agitation of the muscular system, and such a feeling of suffocation as those endued with the greatest fortitude cannot endure. These paroxysms of violent convulsive disturbance of the muscles, and the sense of suffocation, are certainly the most prominent effects of the attempt to swallow, or even look at, liquids; but they may also be excited in hydrophobic patients by other causes, such as the opening or shutting of a window or door, a current of air, a bright light, or the glare of a mirror. Some patients, though not able to swallow liquids, will swallow juicy fruits, if their outer surface be made quite dry before being offered to them. The influence of different sounds on hydrophobic patients is very curious; some of these unfortunate individuals can bear a great deal of noise, without inconvenience; but, if the noise happen to be of a kind which is associated with the idea of fluids, then excessive agitation is produced, and paroxysms of the greatest suffering are brought on. Few hydrophobic patients can bear the noise of a pump, or the clatter of cups and saucers, or the sound of earthenware.

Between hydrophobia and tetanus, the following considerations will serve as a criterion. Tetanus always begins with a spasm of the muscles of the jaw, which remains firmly fixed; in hydrophobia, on the contrary, the jaw is constantly in motion, from the incessant efforts of the patient to get rid of that ropy viscid secretion to which I have already referred.

In hydrophobia, the muscles are not constantly rigid; they are sometimes relaxed; but, in tetanus, they are incessantly hard and rigid; the spasms may be, and indeed are, periodically increased in violence; but the muscles affected are never entirely relaxed.

In tetanus, though there may be difficulty of deglutition, there is rarely a positive aversion to fluids, or a dread of them, and the patient will remain a long time in a bath without any inconvenience; this is not the case in hydrophobia,—the very idea of being put
into a bath would excite such commotion in the patient, as might probably soon destroy him.

The paroxysms of tetanus are neither excited nor increased by light; neither are they affected by the noise or sight of water; but those of hydrophobia are violently increased by causes of this description.

Tetanus mostly comes on soon after the infliction of the wound, that is to say, within a few days; but hydrophobia does not usually begin until a more considerable time has elapsed from the period of the bite.

Then, tetanus will come on after any kind of wound,—even after a surgical operation; but, as true hydrophobia can only be produced by the application of the saliva of a rabid animal to an abrasion or wound, it must have been preceded by the bite of such an animal, or by the application of its saliva to an abraded portion of the surface of the body.

As hydrophobia is still regarded as an incurable disease, it must always be an object of the highest importance to prevent its attack, or the commencement of the symptoms. Fortunately, this may generally be accomplished, by removing the wounded parts as speedily as possible. When, therefore, we are called to a person, who has been bitten by a rabid animal, or by one suspected to be in this state, we should lose no time, and, if the operation be practicable, have immediate recourse to the complete excision of the bitten parts. Sometimes considerable perplexity arises from the situation, or number of the bites; thus, we may meet with cases, where the parts into which the animal's teeth have entered, are very numerous; we may also be consulted for persons, in whom the teeth have penetrated among the small bones of the carpus, or tarsus, or close to a large artery. I remember an instance, in which the bite was situated close to the radial artery. In this circumstance, amputation has been proposed; but it might perhaps be a more justifiable plan to perform the complete excision of the bitten parts, together with the portion of the artery that happens to be in the way, and then secure the ends of the
vessel. The excision of the bitten part is a proceeding which should be adopted early; for it is unquestionably the most likely means of preventing an attack of hydrophobia; but in order to answer this purpose, the incision must be carried deep enough. Now, it frequently happens, that there is an uncertainty about the possibility of cutting out every part reached by the animal's teeth, and on this account, before the operation is begun, I recommend a very simple, but obviously prudent measure to be adopted, namely, washing the wounded part well; we may let a stream of water fall upon it from some height, out of the spout of a tea-kettle, or throw warm water forcibly against the part with a syringe. Thus we may possibly wash away any virus lodged upon the surface of the wound, or near its orifice. I recommend the plan, which Sir David Barry advised, next to be pursued: the ablution is to be followed by the application of a cupping glass to the part; thus, we shall have a chance of removing another portion of the virus, and, at all events, we shall suspend the action of the absorbents in the part, which action, as Sir David Barry's interesting experiments prove, cannot go on when the atmospheric pressure is removed. Having done these things, we should perform excision in the most complete manner possible, and then apply the cupping-glass again. Lastly, by way of still greater security, we may cauterize the part. Such are the most effectual plans, which I can suggest, for preventing the absorption of the hydrophobic poison, and no doubt, if performed in the order I have specified, they would rarely fail. In examples of the bites of snakes, we have not the same opportunity of preventing the influence of the poison on the system, because the effects of the poison take place with surprising rapidity, and, unless we were on the spot at the moment of the bite, the system would be affected before we could put the preventive means in practice; but, in the kind of poisoned wounds now under consideration, the virus is slower in its operation, and hence our plans for averting its action on the system altogether will have a better prospect of success. The interval between the bite and the constitutional disorder being long, and the admission of the
virus tardy, the doctrine is often maintained, that if excision has not been performed at first, it is still called for so long as the constitutional derangement has not actually commenced, provided that not more than eight or ten weeks have elapsed from the period of the bite; for, after the sixth week, the chances of attack lessen from day to day. Of course, the sooner we excise the part, the better is the chance of preventing hydrophobia. Caustic alone should never be depended upon; for many instances of its failure are upon record.

APPENDIX

TO

THE TREATMENT OF GONORRHŒA BY THE EDITOR. (Vide p. 352.)

Since the former part of this article was written, I have adopted a different mode of inserting the slips of lint in cases of gonorrhœa.

Instead of the glass tubes there described, I prepare a number of fine splints, one-tenth of an inch in thickness and two and a half inches in length; these I dip in a strong solution of gum arabic or warm glue, and roll them up spirally from the point, with strips of lint about half an inch in breadth, and about four inches in length, which I lay aside for a few hours, when they are fit for use.

Of these splints I have three different preparations. One set I cover simply with lint alone, which I use in the first stage, after washing out the urethra two or three times with a solution of the nitrate of silver; then filling the urethra again with a jet of the same liquid, I retain this in the canal by compressing the meatus urinarius with the thumb and fore finger of the left hand,
and with the right I insert the covered splint, first touched with an ointment made with the nitrate of silver, in the proportion of one drachm to an ounce of lard; thus prepared, by the fluid distending the canal, and a little ointment on the splint, it may be introduced without the slightest pain or uneasiness to the patient.

After having used the above for a day or two, I have another set covered in the same manner, with the lint saturated with a strong solution of the nitrate of silver, then dried and rolled on the splints as before; these I introduce in the same way as the first set, that is, one every night, after having caused the patient to empty his bladder, and to retain it there until he makes water again, when it is to be withdrawn by a bit of the lint, left projecting beyond the end of the splint for that purpose, and thrown away.

These two stages occupy about ten days, at which time I find all inflammatory symptoms to have subsided; and by syringing the urethra night and morning with a weak solution of nitrate of silver, or a few drops of the tincture of iodine in distilled water, the cure is generally completed in two or three days.

But should the case prove obstinate at this period, I have a third set of splints covered with lint saturated and dried with the tincture of iodine, which I introduce in the same way as before, and this causes a slight irritation in the canal, and a mucous discharge which yields to a few injections of the nitrate of silver night and morning, and then a perfect cure may be looked for.

It is scarcely necessary to inform the reader, that a glass syringe must be used, and that the urethra should be washed out two or three times with a solution of the nitrate before inserting any of the splints.

As for internal remedies I have none; sometimes I give a saline mixture as a placebo.
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