

Lectures on the theory and practice of surgery / by the late Abraham Colles ... ; edited by Simon M'Coy.

Contributors

Colles, Abraham, 1773-1843.
M'Coy, Simon.

Publication/Creation

Dublin : S.J. Machen ...; London : Simpkin, Marshall ..., 1844-1845.

Persistent URL

<https://wellcomecollection.org/works/a8qb3nmr>

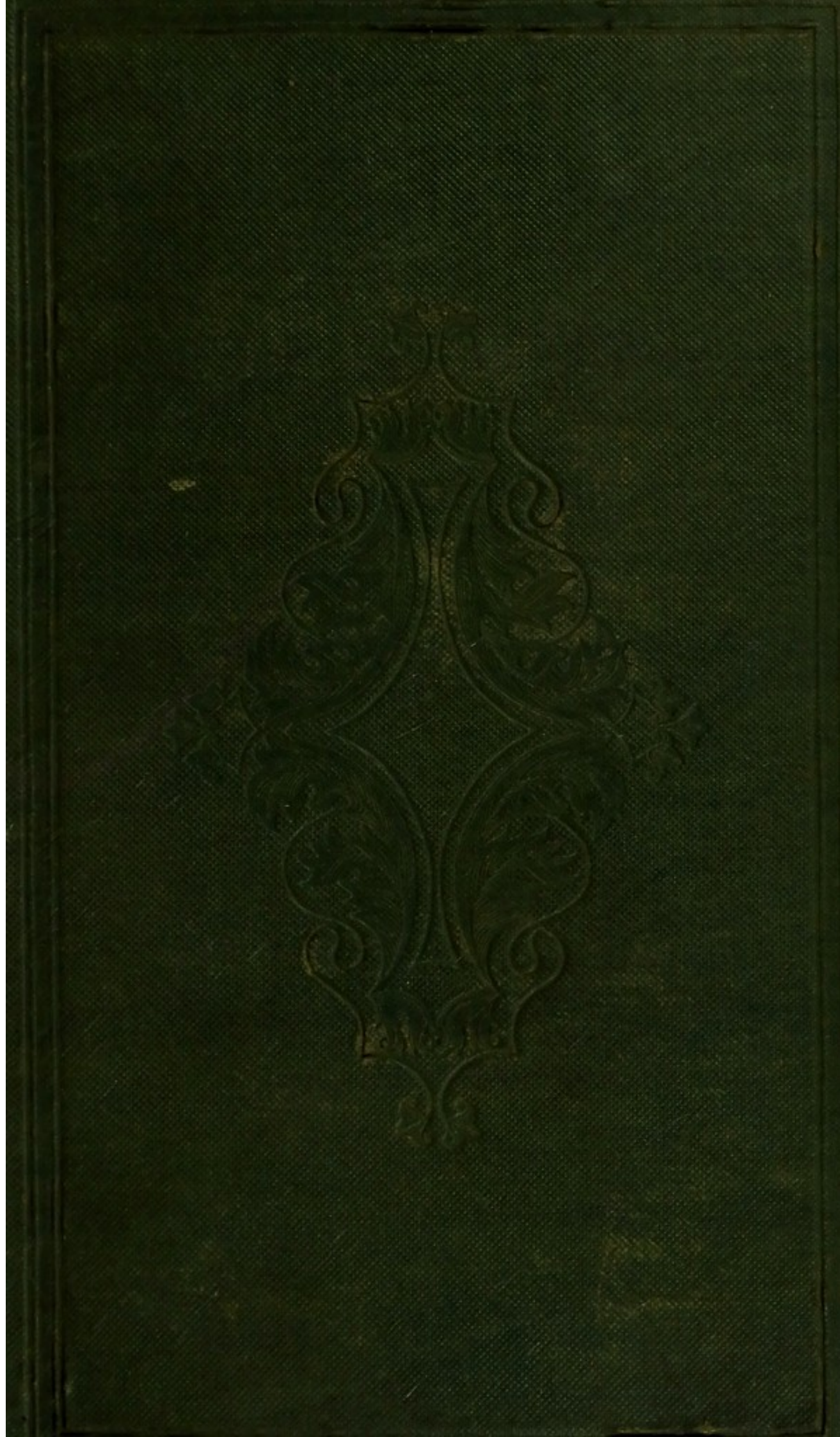
License and attribution

This work has been identified as being free of known restrictions under copyright law, including all related and neighbouring rights and is being made available under the Creative Commons, Public Domain Mark.

You can copy, modify, distribute and perform the work, even for commercial purposes, without asking permission.



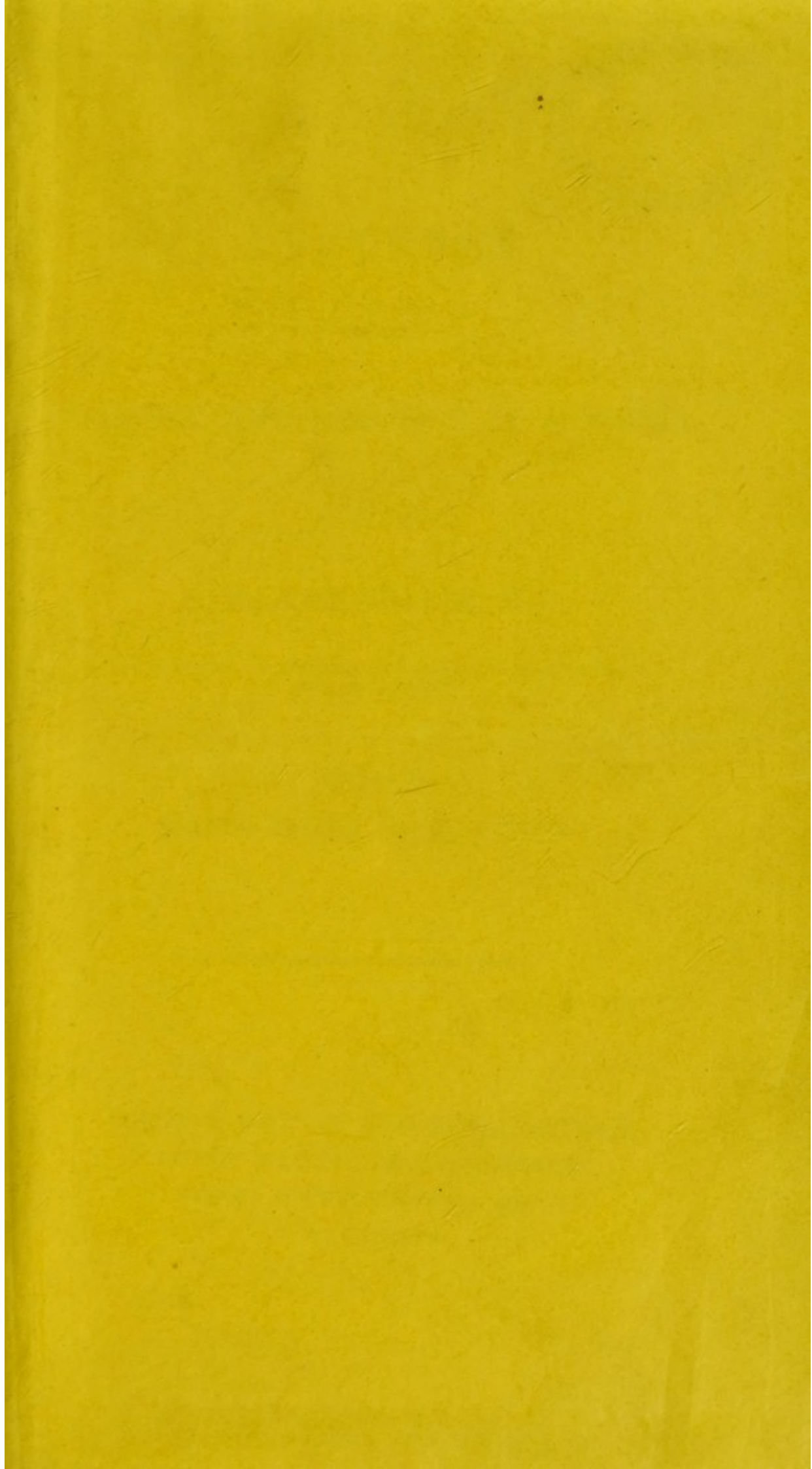
Wellcome Collection
183 Euston Road
London NW1 2BE UK
T +44 (0)20 7611 8722
E library@wellcomecollection.org
<https://wellcomecollection.org>

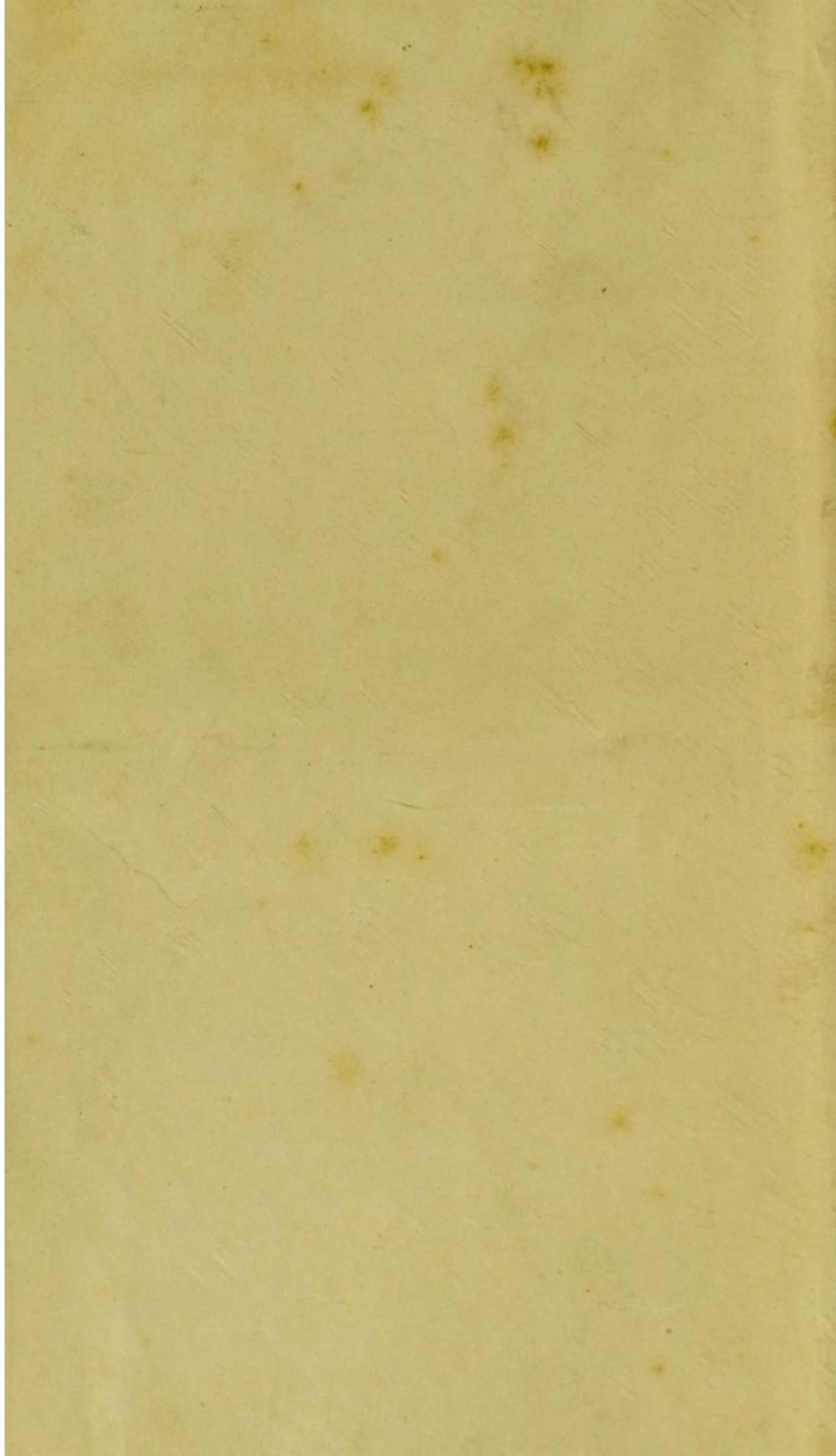


(C)
a.2. v Et

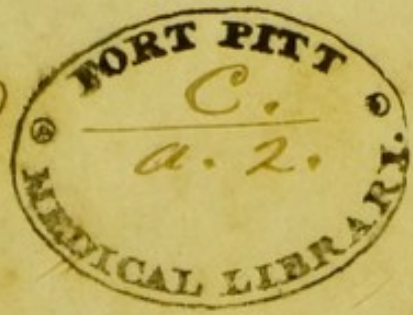
TRO
Strongroom
RAMC
GNI.
/COL

22101945981





23/5/46
W. Chasid



LECTURES

ON THE

THEORY AND PRACTICE OF SURGERY.

BY THE LATE

ABRAHAM COLLES, M.D.,

For thirty-four years Professor of Surgery in the Royal College of Surgeons in Ireland.

EDITED BY

SIMON M'COY, Esq., F.R.C.S.I.

(Reprinted from the Medical Press.)

DUBLIN: S. J. MACHEN, WESTMORELAND-STREET,
FANNIN AND CO., GRAFTON-STREET.

LONDON: SIMPKIN, MARSHALL, AND CO.

MDCCCXLIV.

Printed at the Office of the Medical Press, 15 Molesworth-street, Dublin.

PREFACE.

To the Medical Practitioners of Ireland of the present day, who, with scarcely an exception, have been pupils of the late Professor COLLES, the Publishers feel that it would be superfluous to offer any excuse for presenting them with a faithful transcript of the lessons which they have had the advantage of receiving direct from the lips of that eminent Surgeon. To these gentlemen it can only be necessary to say that the present publication has been compiled from notes of several courses of Mr. COLLES' Lectures, taken and carefully collated with the manuscripts of others of his pupils, by a gentleman whose professional zeal and accurate information are well known to his brethren. The following pages will readily be admitted, by those best capable of forming a judgment on the subject, to contain a true and correct record, not only of the matter of the invaluable Lectures delivered by Mr. COLLES, but of the manner of the Lecturer, and, as such, the Publishers trust their undertaking cannot fail to be acceptable to those who enjoyed the pleasure of his acquaintance, or profited by his instruction, and who will here find an agreeable reminiscence of past times.

There is another class to which the publication of this "Body of Surgery," in a cheap and accessible form, will be productive of an important benefit. The Lectures of Mr. COLLES were eminently practical, and in them the student and young surgeon will find that assistance, in the daily occurrences and difficulties of practice, which they would seek in vain amid the bushels of theoretic chaff, by which the grains of actual knowledge are too often concealed in systematic treatises on surgery. The reader of these volumes may indeed, occasionally, miss an ephemeral theory, or find no mention made of some new-fangled invention of a closet surgeon; but he will never fail to find plain precepts for his guidance when doubts arise in his mind as to what he should actually do when he stands by the bedside of a patient, or walks the wards of an hospital. For the elimination of such precepts, and not in the invention of theories or surgical toys, Mr. COLLES employed the resources of his vast experience, and for their record in the following pages, the favour of the medical public is now respectfully, but with confidence, solicited.

CONTENTS OF VOL. I.

LECTURE I.

	Page.
Inflammation—Kinds and characters of—Causes— Inflammatory Fever—Adhesion—Suppuration and Abscess—Treatment, - - - - -	1

LECTURE II.

Hectic Fever—Symptoms of—Varieties in—Treat- ment. Mortification—Kinds and symptoms of— Causes producing—Treatment, - - -	20
---	----

LECTURE III.

Pott's Gangrene—Cancrum Oris—Erysipelas— Modes of attack—Treatment. Chronic Erysipe- las—Erysipelas of Infants, - - -	36
---	----

LECTURE IV.

Contusion—Wounds—Simple incised—Lacerated— Punctured—Gunshot Wounds—Nervous Affec- tions from Wounds, - - - -	49
---	----

LECTURE V.

Tetanus— Diseases with which it may be confound- ed—Symptoms—Treatment, - - -	68
--	----

LECTURE VI.

Hydrophobia—Symptoms in Dog—Symptoms in Man—Treatment. Ulcers—Simple Purulent— Fungous—Callous, - - - -	83
---	----

LECTURE VII.

Hospital Gangrene—Anthrax—Furunculus—Mam- mary Abscess. Paronychia, - - -	101
--	-----

LECTURE VIII.

Page.

Injuries of the Head—Contusion and Wounds of Scalp—Simple Incised Wounds—Lacerated Wounds—Erysipelas of the Scalp, - - -	119
--	-----

LECTURE IX.

Injuries of the Head—Concussion—Inflammation within the Cranium, - - - - -	129
--	-----

LECTURE X.

Injuries of the Head—Inflammation within the Cranium, continued—Formation of Matter. Fractures of the Cranium, - - - - -	141
--	-----

LECTURE XI.

Injuries of the Head—Trepanning—Concluding Observations. “Practical Precepts” on Injuries of the Head, - - - - -	156
--	-----

LECTURE XII.

Division of the Frenum Linguae. Hare-lip. Encysted Tumours of the Eyelids, &c. Injuries of the Throat, - - - - -	174
--	-----

LECTURE XIII.

Tracheotomy—Inflammation of Glands about the Neck—Glossitis. Polypus. Wounds of the Thorax, - - - - -	189
---	-----

LECTURE XIV.

Wounds of the Thorax, continued—Wound of Lung—Axillary Abscess—Wounded Intercostal Artery—Gunshot Wounds of Chest—Pneumonia—Empyema, - - - - -	206
--	-----

LECTURE XV.

Injuries of the Abdomen—Contusion—Incised and Punctured Wounds—Wounds of the Bowels, Stomach, and Bladder, - - - - -	226
--	-----

LECTURE XVI.

	Page.
Peritonitis—Paracentesis Abdominis—Wounds of Tendons, - - - - -	243

LECTURE XVII.

Hernia—Divisions of—Causes of—Diseases resem- bling, and Diagnosis—Taxis, - - - -	256
--	-----

LECTURE XVIII.

Hernia, continued—Ventre-inguinal—Irreducible Hernia—Strangulated Hernia—Hernia strangu- lated in the Inguinal Canal, - - - -	270
---	-----

LECTURE XIX.

Hernia, continued—Hernia Congenita—Hernia In- fantilis—Operation for Inguinal Hernia, -	285
--	-----

LECTURE XX.

Femoral Hernia—Parts connected with—Diagno- sis—Operation—Mr. Colles' Operation, - -	300
---	-----

LECTURE XXI.

Umbilical Hernia. Wounds of Arteries—Secon- dary Hæmorrhage—Ligatures, - - -	315
---	-----

LECTURE XXII.

Aneurism—Diagnosis—Treatment, - - -	334
-------------------------------------	-----

LECTURE XXIII.

Aneurismal Varix—Varicose Aneurism, - -	356
---	-----

LECTURE XXIV.

Cancer—Cutaneous Cancer—Scirrhus—Diseases resembling, - - - - -	364
--	-----

LECTURE XXV.

Scirrhus, continued—Removal of the Breast. Fun- gus Hæmatodes, - - - - -	375
---	-----

SURGICAL LECTURES

OF THE LATE

PROFESSOR COLLES.

LECTURE I.

INFLAMMATION—KINDS AND CHARACTERS OF—CAUSES—
INFLAMMATORY FEVER—ADHESION—SUPPURATION
AND ABSCESS—TREATMENT.

GENTLEMEN—Before entering on the consideration of particular surgical diseases, it is necessary to bring before you the subject of inflammation—a condition which attends, and, more or less, modifies them in character and consequences, with which our treatment is materially concerned—which influences many surgical operations, and not unfrequently demands our chiefest attention. There is no subject of medical inquiry that has engaged so much the pen of writers as inflammation, particularly on theoretic questions. A lecture-room would not be the place to discuss those abstract speculations of individuals on points, many of which still remain in obscurity, notwithstanding the labours of some of the most eminent men of our profession for their elucidation. It is not my wish to undervalue even the least productive or satisfactory of these discussions, and, still less, to lead you to think lightly of them ; you must peruse more than

one work on the subject—you must study the arguments in your closet—weigh them with each other—and if you do not easily come to a conclusion on the theory, you will at least have acquired a good deal of useful information for practical purposes.

Inflammation will not admit of being defined; the phenomena, however, which evince its presence have been laid down by old writers in the few words—“*Rubor et tumor, cum calore et dolore*,” to which little has been added up to the present day. There is a *redness* in the part, no matter how pale the structure may have been in a state of health; the part becomes *swollen*—there is more *heat* than natural in it—it is *painful*, and its *functions* become *impaired* or *destroyed*. So far is very simple, but when we come to look more into the matter, we find these evidences of its existence greatly diversified by circumstances. There are different *kinds* of inflammation; hence we employ the terms *phlegmonous*, *erysipelatous*, *gangrenous*, &c., to mark them generally, to which are often added *scrofulous*, *venereal*, *gouty*, *cancerous*, &c., to indicate specific inflammations, which, while they possess many of the common characters of the simple forms, possess peculiarities sufficiently well marked to place them by themselves. Inflammation may be seen in two states or conditions, indicated by the words *acute* and *chronic*, to the former of which the inflammatory characters mentioned by writers are more particularly applicable. Now, the *redness* of an inflamed part will vary in shade according to the kind of inflammation and constitution of the individual; for example, phlegmon in a strong healthy man will be of a bright red—something of the colour of arterial blood; when unhealthy, it is generally of a darkish hue, inclining to purple; in erysipelas, it will be of a rose colour, with a shade

of yellow; in the gangrenous kind, it will incline to a brownish tint; but I think too much stress is laid on those shades, which, although in general correct, will be found by observation to be less certain than some authors would inculcate. In phlegmon the colour ends rather abruptly, in other cases it melts gradually away, so that by it alone you could not well tell, in many instances, how far the disease extended. A diagnosis is improperly based on fancied differences regarding the colour; some tell us that we can distinguish an erysipelatous inflammation at once by pressing the point of the finger on the part, and that if on removing the pressure the part is pale, remains so for an instant, and then gradually resumes its redness, the case is certainly erysipelas; but the fact is, the same thing will occur in other kinds, or even in the healthy redness of the skin; and I may here once for all warn you that you should never trust to any *one* symptom for a diagnosis in almost any local or constitutional disease that you may be called on to treat. The *swelling* of an inflamed part differs very much under different circumstances; it does not depend on the intensity of the inflammation; it is never so great in a dense unyielding part, such as ligament, as it is in the looser structures; it is prominent and even conical in healthy constitutions, where it would be flat and more extended in its outline in a bad one; it is sometimes very firm to the touch, sometimes soft and yielding—sometimes elastic, and sometimes doughy, retaining for a time the impression of the finger. The actual *heat* of an inflamed part is sometimes but little raised above the natural standard, and hardly excites the attention of the patient—at other times it is very distressing and of a sharp burning kind; it does not seem to depend much on the natural sensibi-

lity of the part or the strength of the patient. We may pass over many of the explanations offered for those symptoms: you can read them in elementary books on the subject. The redness is no doubt caused by a greater quantity of blood sent to the part than usual, but *how* this local increase of vascularity is accomplished, is far from being accounted for with any degree of certainty. That the arteries perform an active part in it, may, I think, be inferred from their stronger pulsation in, and near the seat of the affection, than in their natural state; if a man has a whitlow, the radial artery, and sometimes even the brachial of that side, will obviously beat much stronger than in the other arm. That the vessels supplying an inflamed part are enlarged, is seen in this preparation—it is the head of a rabbit; during the animal's life inflammation was excited in one of its ears, and when it was at its height the rabbit was killed, the head injected, and you perceive that the inflamed ear has dried, thicker, and more opaque, and that its vessels are larger and in greater number than in its fellow of the opposite side that had not inflamed. You can well observe the truth of this also during inflammation of the conjunctiva, and some other particulars, on account of the transparency of that membrane. Besides the accumulation of blood, the swelling is caused by effusion of serum into the interstices of the cellular membrane; and in this case the swelling pits; sometimes coagulable lymph is effused, and then the swelling is hard, but does not pit. It is said the *pain* is caused by pressure on the nerves of the part; but I think this is not the case, for the most intense pain is often felt in parts in which there are naturally very few nerves distributed, such as bone, tendon, serous membrane, &c. Munro says the pain

arises from an increased sensibility in the part, owing to its greater vascularity, but this is disproved by the fact that the peculiar sensibility of certain parts, as the pituitary membrane of the nose, is diminished in inflammation; it would seem that the pain is caused by some *change* in the nerves not yet understood.

The *causes* of inflammation may be divided into *predisposing* and *exciting*. There is a great difference in the predisposition of different people to inflammation; you will observe this even in particular families, as well as individuals; besides peculiar idiosyncrasies, there are several other circumstances to render one man more liable than another; people living in cities will in general differ in this respect from country people; habits of living and kinds of occupation have likewise their effect in predisposing to inflammation under the same exciting cause.

Local inflammations are always more or less liable to produce a disturbance of the system which is called *fever*, and this fever assumes characters peculiar to the kind of inflammation which excites it; in their general symptoms surgical fevers resemble certain medical fevers, but they have always peculiarities of their own sufficiently well marked. We have fevers in surgery of the continued, remittent, and intermittent types, but, when considering the particular cases in which one or other of those kinds is met, we shall find there are essential points of difference between them, and a corresponding one in a purely medical fever. At present, I shall confine myself to a few remarks on inflammatory, or as it is sometimes called, symptomatic or sympathetic fever. It is ushered in with a rigor—this is succeeded by a general sensation of heat, and this again by sweating; there is headache, thirst, constipation, and a full pulse. While

the fever lasts all the secretions, morbid as well as natural, are diminished ; if a patient has a gonorrhœa or gleet, or a running sore on his leg, or an issue in his arm, they will all dry up on the accession of inflammatory fever, from any cause ; the thirst, diminished secretion of urine, and of the mucous membrane of the bowels, the dry tongue, &c., may all be explained by this one fact. This is the sort of fever met in phlegmonous inflammation in a healthy constitution, and our treatment will be directed simultaneously to it and to the local affection. Now, the occurrence of this fever, and its severity, depend very much on the constitution of the patient, although it is necessarily dependent on inflammation as an exciting cause ; yet the presence of this cause does not always call it into action, as in slight and trivial cases, in a person of good habit. When the local inflammation is reduced, the fever will subside, and its departure is often marked by what is called a critical symptom, such as sweating, or diarrhœa, &c., leaving no trace behind except a little debility. But this is not always so, for the inflammatory fever sometimes gives place to, or merges into, a fever of another kind, apparently owing to a new turn in the inflammation itself ; these changes in the local disease are called—perhaps rather loosely—*terminations of inflammation*. The most favourable and common termination of inflammation is by what is called *resolution*—that is, where on its departure it leaves the part just as it was before it was attacked. But it may end in *suppuration*, or by *adhesion* or *gangrene*. Each of these will be considered in its proper place ; at present, we have only to deal with the treatment, with a view to resolution. The local applications are either cold or warm ; cold water or medicated lotions are often extremely useful,

particularly when there is a sensation of burning heat in the inflamed part, but their long continuance, where the inflammation is very high, is not free from danger; mortification has often been brought on by reducing its temperature too much, or too quickly, particularly in delicate constitutions; this caution is necessary to be remembered, as we have sometimes other objects in view in applying cold over an inflamed surface, as in strangulated hernia, besides the mere service it may render the inflammation; we must, therefore, watch carefully that our cooling process is not carried on too long. Objections have been started to applying cold to an inflamed part in the immediate neighbourhood of the great cavities, in the apprehension of repelling the inflammation to the interior. I think the fear is perfectly groundless: I have never seen a case which bore out such a conclusion, and if cold lotions were desirable, I should have as little objection to applying them over the thorax or abdomen as any where else. But cold does not agree in every case of local inflammation; sometimes you must apply warmth, and the best criterion—perhaps the only one—by which you are to judge, which is best in any particular instance, is that which the patient feels most agreeable to his sensations. You will be hardly ever wrong when it soothes the part, because this soothing is the very thing we aim at, knowing it is one of our best means to lower the inflammation. Now, warm stupes will often be found to lessen the pain and feeling of tension better than cold, and particularly where the feeling of tension is very strong, and they should be used notwithstanding the objection that they bring more blood to the part; a better objection to them is the slopping and wetting the bed-clothes, teasing an irritable patient and exposing

him to cold from their damp. If you use them you will find that in different cases they must be of different degrees of heat; for instance, you can hardly make them hot enough for the comfort of the patient when matter is making its way through tendinous structures. Various medicinal plants are boiled or macerated in the water of stupes, but I doubt that they are of any use; I am not, however, certain; if any of them do service, it is chamomile, which, I think, I have seen somewhat useful. Poultices are likewise used with nearly the same object as stupes, and, like them, it little matters of what ingredient you make them, provided they are calculated to keep their moisture long. It is absurd to expect a poultice will retain a heat greater than that of the part on which it is put for any length of time; where that is wished for, stuping will be better. Were it not for their weight and the difficulty, in some situations, of keeping them exactly on the part you desire, poultices would be often found very useful, but their only purpose, on a simply inflamed surface, is to keep it soft and moist, and to maintain an equal temperature; if they be applied too hot they will irritate, and continue to do so until they cool down to the natural heat of the skin. Linseed meal worked up in hot water to the proper consistence is very light, and keeps its moisture longer than any other I know of; bread and milk is apt to get dry and hard, and if kept on in this state often does a great deal of harm. Local bleeding is among the means we employ to subdue inflammation; for this purpose scarifications, cupping, and leeches are not to be used indiscriminately. To cup and scarify an inflamed part is just adding fuel to fire: leeches alone should be used, and even those put to a highly inflamed part may add to

the inflammation already existing, or produce erysipelas. Another objection to leeches is that it is sometimes extremely difficult to stop the bleeding when enough of blood has been taken away, and this notwithstanding every thing that you may try for the purpose. This, in an adult, is not of much consequence generally, but I have known more than one child to die of the continuance of the bleeding from leech-bites. You must never forget what a very small quantity of blood an infant can bear to lose without danger, and if a leech or two must be applied to one of them, it should be carefully watched, for the child will fall asleep, and from want of proper caution, may continue to bleed until it is too late to redeem the negligence. Above all things, guard against the use of the Swedish leech, the bite of which will never be obliterated. You should not apply leeches near to each other, for if one bite should ulcerate, it will extend to the neighbouring bites, they will run into each other, and sometimes be followed by very unpleasant consequences. On the whole, I do not think leeches by any means so useful as they are represented, except sometimes over inflamed glands, and perhaps in ophthalmia. I need say little of blisters, as no one would be mad enough to put a blister on an inflamed part; after other means have been premised, a blister at some distance from it will occasionally be very useful, such as to the nape of the neck, or behind the ears in inflamed eyes. Now, in these cases they do not produce their good effect from the quantity of serum they make to be thrown out, but from counter-irritation, or a kind of sympathy between the two parts. Blisters are serviceable in removing the sequelæ of inflammation, such as the induration that sometimes remains, but on no account

are they to be put on, or very near a part in a state of active, acute inflammation.

When inflammation is attended with a high degree of fever, mere local treatment can avail but little, except perhaps in children, where the blood drawn by a few leeches will make a serious impression; therefore our attacks must be made on the system generally—it is often the only thing we have to attend to. The first thing to be done is to take blood from some of the large superficial veins, as those of the arm, and in such a case as we suppose, the quantity to be taken away is not more important than the manner of detracting it, nor of so much. You may take, say, from sixteen to twenty-four ounces at once, but to obtain the full effect from it, it must be taken from a large orifice, and until it causes fainting. Your great object is to make an impression on the system, and if you succeed in this, you may not have any need to repeat the bleeding; recollect that by taking away the blood suddenly, and making the patient sit up in bed while bleeding him, so as to make him faint, you *save* blood, and consequently the patient's strength. Ten ounces drawn properly may have more real effect on the disease than five times the quantity without such precaution, and an actual saving of blood in some of these cases is very important. But take care that you do not mistake the cause of fainting—it must not be from the sight of the lancet: it must be from the detraction of blood and not from the patient's timidity. Many of those things which would be of use in inflammation will do more harm than good if given in the height of the fever attending it. In speaking of stupes and poultices, I mentioned that their use was to allay pain. Now, opium is given for the same purpose, but it will produce no beneficial

result if given in the height of the fever, but will frequently act the very contrary way. In certain cases of acute inflammation, mercury is a very powerful remedy, but it will do no good but harm if exhibited before bleeding and other means be employed to reduce the fever; the good effects of mercury only become apparent when the mouth is touched, and this can hardly be achieved when high inflammatory fever is present. The continuance of the symptoms indicate a repetition of the depletion; now, the blood first drawn, when left at rest for a few hours, exhibits on its surface what is called the *buffy coat*—if it is hollowed at top, and if, when you push your finger into the clot, it feels firm, you are told you may repeat the bleeding with advantage, and so in general you may; but this appearance of the blood must not be *entirely* relied on, as it does not entirely depend on the condition of the fever; for it is seen well marked in cases where there is no fever whatever existing, as in pregnant women, and in other cases where copious bleeding would be very unnecessary, and often injurious; if the coagulum is soft, you will hesitate to bleed your patient again, but if the buff has a tinge of green in it, do not on any account repeat your bleeding. In many cases the pulse is not to be trusted as to the necessity for venesection. In old people, for example, the arteries will often pulsate so as to resemble perfectly a pulse that would require large bleeding, so will those of a person long labouring under dropsy, &c. In other cases you will find the pulse in such a miserably small, weak, compressible state, that notwithstanding there may be infallible symptoms of high acute inflammation present, you would be almost afraid, if you relied too much on the pulse, to use the lancet; yet you will find, in many

such cases, that after taking away some blood, while the blood is flowing even, the pulse will rise to the full hard condition that you would expect in ordinary cases.* Purgatives are of great use in the treatment of inflammation, but they should not be of the heating kind; the saline purgatives are the best, with perhaps a pill of calomel given one, two, or three hours before the salts. Purgatives chiefly act in reducing inflammation by causing a large discharge of watery fluid from the mucous membrane of the intestines; by increasing the secretion of one part the inflammation is drawn off from another. When the skin is very hot and dry, sudorifics might be given, but not until bleeding and purging have been practised. Emetics are seldom required in surgical diseases, but in medical cases it is different; in croup and the exanthematous diseases, for instance, they are of the greatest use. I know of no surgical case where they are of much use except hernia humoralis. Keeping up a high temperature in the patient's room, or loading him with bed-clothes, will increase the fever: you must therefore keep him cool, and as quiet as possible.

As the fever attending inflammation may be of any shade or degree, from the highest inflammatory to the lowest typhus, you cannot treat them all alike—you cannot practise rigidly the antiphlogistic plan in all

* The state of the pulse in these cases is, I think, very much dependent on the *respiration*, and it is only where the breathing is relieved by the flowing of the blood, as it often is in pleurisy and peritonitis, that the pulse rises; and that one can always see this connection. The presence of the buffy coat will also be found to depend on the relief given to the breathing, and in the same proportion.—*Ed. of Lect.*

that may come before you ; we shall have to notice some in which a quite different line of treatment must be pursued, for the treatment must always be applicable to the nature and condition of the fever. When we meet a case of high fever arising from local inflammation that we know must end in suppuration, as in a case of compound fracture, we are not to push our antiphlogistic treatment so far as to *reduce* that fever completely, our object should be merely to *moderate* it, for the rest of the fever will vanish when the suppuration is established.

In some inflammations, as the gouty, resolution is out of the question ; in others, as the rheumatic, bark must be thrown in ; the pulse in this latter is such a one as on general principles would induce you to use the lancet, and freely too ; but if you do so, you will do harm instead of good. If a man gets inflammation in his eyes from cold or damp, you must give three or four grains of calomel with or without opium every three hours, and in twenty-four or thirty-six hours, when his mouth becomes slightly affected, the inflammation disappears as if by magic. You will perceive, therefore, that there can be but few general rules for the treatment of inflammation, and experience will teach you how much it must be modified by circumstances.

Let us now go to the other terminations of inflammation. If you examine a clean cut three or four hours after it has been made, you will find its lips glued together by lymph ; if you gently separate them from each other, although you break up the adhesion there was between them in doing so, you will not see any rupture of vessels—there will be no bleeding ; but examine this wound in twenty-four hours you will find that this lymph has become vascular, and in

twelve or fourteen days the lips of the wound will be in complete apposition, the entire of the lymph having been removed by the absorbents. This lymph is not effused but secreted—it is not that which has been poured out by the cut extremities of the vessels, but which is formed by the minute secreting vessels of the part. All lymph is not organizable, the lymph thrown out in phlegmasia dolens, for instance, does not become organized; the organizable lymph is different from that which separates from blood drawn from a vein; if they were the same, the lymph thrown out by the inner coat of an inflamed vein would be washed away by the current of the blood as fast as it was formed, but this is not the case. Hunter, therefore, speaks very absurdly when he directs you not to wash away the blood that is poured out between the lips of a wound, under the notion that it would, if left, become a bond of union to them, and tend finally to their vascular union; two serous surfaces will be found in perfect apposition, perfectly united by the adhesive inflammation without any lymph between them, although an effusion of organizable lymph was the first step to that adhesion; in a bloody tumour of the scalp the blood is hardly poured out by the torn vessels when it is surrounded by a covering of lymph, and after days, or even weeks, the blood will be found almost, or entirely, in a fluid state. There is no criterion by which we will be enabled to decide in the first instance whether the simplest wound will certainly heal by the first intention, or suppurate. A rigor coming on, before the fever is fairly established, is no proof that suppuration will follow, for it is the natural commencement of the inflammatory fever, or may be caused by the fright, &c., but when the rigor occurs *after* the inflammation and fever are fully

formed and have existed some time, it always indicates suppuration, and when this last is established it is a sort of crisis to the inflammatory fever, or, as the case may be, one of a typhoid kind, which sometimes precedes the formation of matter; the redness of the inflamed part will then assume a yellowish tinge; and the heat and pain of the part will be assuaged, the tongue will become moist, the dryness and heat of skin will give place to perhaps a gentle perspiration, the pulse will become soft, and the bowels be moved. There is this analogy between the processes of adhesion and suppuration that the vessels become enlarged in the part. Pus is generally a secretion from a layer of coagulable lymph become vascular; the hardness that surrounds a suppurating part is owing to this lymph poured out into its structure by the adhesive inflammation; in acute abscess, then, the matter is always contained in a chamber of lymph which prevents its diffusion into the surrounding structures. This chamber is lined by a secreting membrane very analogous to mucous membrane; the track of an abscess is marked by a line of coagulable lymph, or this new membrane. I do not know how the wall of an abscess enlarges, but it is obvious it must enlarge as the contained pus increases in quantity. If it was from the pressure of the surrounding parts that the matter of an abscess gets to the surface, the most prominent part of that abscess should be the most tense; but the fact is directly the reverse, and we find, as Hunter has most satisfactorily explained, that the surface towards the skin is shrivelled—there is an actual elongation of the skin over the abscess. As the abscess is making its way to the surface there are two processes going on—viz., an absorption of the cyst and a deposition of lymph, thus gradually advancing the

abscess, and at the same time, preventing diffusion of the matter.

Although coagulable lymph is so generally connected with the formation of matter, there are cases where pus is formed without the slightest abrasion of the surface, or a particle of lymph being thrown out at all; in no instance, except in mucous membrane, is pus ever formed by an original structure; when it is formed by a wound, or under the skin, or any where else except a mucous surface, there is always a layer of coagulable lymph first thrown out; this becomes organized, and then secretes the matter. Benjamin Bell supposes pus to be formed by fermented serum; but this is not true, for serous effusion into cavities or elsewhere never becomes pus; you will read many other opinions on this subject equally unfounded, but fortunately it is one of no practical importance. Now, is it always easy to determine whether matter has really been formed, even when near the surface? It is not, although nothing may appear easier to you than to ascertain the fact by the feel of *fluctuation* in the part, and if you trust to one symptom or test in any disease, you will be frequently led into error; those who have the best tact in discovering matter may be deceived. One cause of error may be this—if you apply your two fingers on the opposite sides of an abscess, and press with one, the other will feel the fluctuation distinctly; but if the fingers be placed *too close* to each other, the elasticity of the part pressed by the one finger will give a sensation like fluctuation to the other, although no matter be really present; in fact, fluctuation is a bad test, for if the parts under which the matter lies be very tense, it cannot be felt. Effusion into a bursa, and fungus hæmatodes in the gums, or any where else, will communicate to the finger the

exact feel of fluctuation. When matter lies under a fascia of a limb fluctuation will not be felt, but if you pass your fingers over the surface of the limb, they will be supported evenly, except where the matter is afterwards to point, and there they will *sink*—you will feel the support or resistance, which the fingers received in every other part, to be lost there. Some abscesses require to be opened early, as over a joint, in contact with the synovial membrane, but not communicating with its cavity, lest it may make its way into the joint if you delay giving it exit externally. Abscesses in the neighbourhood of a large artery should be opened early, as also collections of matter under a strong aponeurosis, or in parts containing large quantities of loose, fatty, or reticular cellular membrane, which would permit the matter to accumulate to a great extent before an opening would form of itself. When you know suppuration to be inevitable, it is desirable to bring the abscess to maturity at once: now remember that the formation of matter, or its progress to the surface, is delayed by either a very high degree of fever and inflammation, or a very low condition of the system or the part—to accelerate the object you desire, it is obvious that the same means will not do in both cases; in the first you apply fomentations and poultices which tend to diminish the over action, by soothing the part and softening the skin, which, by the way, is their only use in the case; while in the second, you support the system and stimulate the part. When there is much pain in the part (unless it arises from the unyieldingness of the structures under which it is forming, as in whitlow) matter will not form properly, and will be productive of much constitutional irritation—the matter that may form will be of a thin bad kind, and the progress slow.

There are several methods recommended for the opening of abscesses; where the object is simply to give exit to its contents in a healthy subject, it ought always be opened with a lancet. It leaves a clean little cut, easily healed, whereas if the abscess breaks of itself, or is opened by some other of the modes advised, there will remain an ugly circular opening, very tedious in healing. A rule has been laid down in books to open an abscess in the most depending part, but it is a bad rule, for that, in fact, may be the thickest part of the wall of the abscess, and you are only to be guided in your choice of the best part to make your puncture by selecting the *thinnest* part of its parietes. If you open it any where but in the thinnest part, what will the consequence be? Why, just this—that nature will make her opening where she at first intended, and this even though the opening the surgeon made be in the most depending part, and be discharging freely. Setons have been advised for discharging the contents of an abscess, on the ground that it prevents the entrance of air into its cavity; but this advice is absurd. Can it be supposed that in drawing a thick rope of silk threads through an abscess, air will not also be drawn in with it? But I think it very doubtful that if air *did* get into the cavity of an abscess, it would be productive of any ill consequences whatever. The only case where it would be at all rational to employ a seton for this purpose is where you would wish to evacuate the matter *slowly*. It has been said that opening abscesses with caustic improves their character or condition by its stimulus; but I never saw any solid ground for this opinion. You will, however, make a difference in your plan of opening according to the nature of the abscess; in an acute healthy abscess,

you have only to make an opening with your lancet sufficient to let out the matter, but where it does not *point*, in a chronic or unhealthy abscess, you should make a large opening, and you will find that such will improve its condition. There, however, are exceptions in particular cases, where a *large* opening would not be desirable, as we shall see hereafter.

When the cavity of an abscess is being obliterated, the opening becomes on a level with its floor, and this state of the parts is termed an ulcer. When matter is to form, the local inflammation and the fever increase together for three or four days, and the part is hard to the touch. In this state use the antiphlogistic treatment, but when once the fever subsides, although the inflammation be still rather high, bleeding, and other strong measures of that description, would only retard the matter, which is now forming, and do no good. If a man gets, suppose, a wound of a sword in the palm of his hand, which goes through it, the skin through which the sword passed will heal, but the fever increases instead of diminishing, and creeps into the typhoid or irritative kind, from the inflammation and absorption of the fascia which continues after the skin heals; here if the patient is timorous and will not let you make the necessary opening, you must give him opium, and this will relieve the feverish state of the system; except poulticing and stuping, you can do little more under the circumstances.

LECTURE II.

HECTIC FEVER.

HECTIC FEVER—SYMPTOMS OF—VARIETIES IN—TREATMENT. MORTIFICATION—KINDS AND SYMPTOMS OF—CAUSES PRODUCING—TREATMENT.

THERE is another description of fever, often connected with the process of suppuration, called **HECTIC FEVER**, which is very different from other constitutional sympathies with local diseases of which I have spoken. Cullen and others assert that the presence of pus is necessary to the production of this fever, but certainly this is not the fact; we meet it often where a particle of pus is not to be found in any part of the body. You will see, for instance, a woman of delicate constitution fall into decided hectic from suckling her infant longer than the state of her strength or constitution would warrant her in doing, and yet there may not be the slightest indication of any organic derangement to cause the formation of pus, either at the time or in perspective. Here is a case where simple exhaustion brings on the disease, and if the constitution be sound in other respects, its cure is simple and effectual. Strong emotions, or affections of the mind, if continued for any length of time, will, alone, bring on a hectic, which will be fatal if it does not receive proper attention. You see an example of this in the disease termed *nostalgia* by authors—where a conscript or recruit is forced to leave his family and his country, for the first time it may be, with small hopes of ever seeing either again. In neither of these instances, nor

in many others that might be cited, is any pus formed; and that there is no mistake as to the actual cause of the hectic is proved by the fact, that it is effectually cured by making the woman wean her child, and sending the man back to the persons and places for which he yearns. Many cases of hectic present themselves where either no pus is formed at all, or where there is no proportion between the fever and the local affection supposed to be its cause. In hectic from a diseased joint the quantity of pus may be extremely small; and, on the other hand, we have cases where large collections of matter have been absorbed, by means of a successful line of treatment, or some change in the part or the system, and not a sign of hectic will be developed from beginning to end. There does not seem to be anything in the qualities of simple healthy pus that would lead us to think it ought to cause so serious an effect on the constitution; it is a mild, bland, semifluid secretion, unirritating, tardily yielding to putrefaction, sometimes lying quietly encysted, for months, in the body; and for even years continuing to be secreted from the surface of an issue or other ulcer, without prejudice to the parts with which it has been in contact. We are still in the dark as to its uses, but, except from circumstances wholly unconnected with its particular nature, we see no injurious effects from its presence.

Hectic fever, when originating in a local injury or disease, is not a primary or immediate consequence of it; it seems to depend at least as much on an original tendency of the patient's system to be affected by it, as on the occurrence that more immediately appears to call it into action; for there is not any very exact proportion between the violence of the original injury and the chances of its being followed by hectic; trifling

ones sometimes being followed by a rapid and fatal hectic, and extremely violent ones, on the other hand, escaping it altogether.

How are we to know when a patient is hectic? It is often extremely difficult to decide the point in surgical diseases, although easy enough in others, as in phthisis. In surgical hectic the symptoms are never so regular as in others. Hectic fever is often preceded for weeks or months by wandering pains in the limbs like rheumatic pains; here the greatest caution is necessary on the part of the surgeon, for if the patient has had the venereal disease, and that he was treated irregularly, they might be mistaken for venereal pains, and if mercury be, in consequence, exhibited, the patient is driven rapidly into the worst stage of hectic. As soon as the fever sets fairly in, those pains gradually subside. The first symptoms of hectic may be easily, and in fact frequently are, unnoticed; it is so irregular in the occurrence of its paroxysms, that in any six days of its duration there will not be three of these days in which the paroxysms will happen at the same hour. The patient at first only feels a little weakness; he is conscious of not being able to use as much exertion as he used to do, and his friends remark he does not look so well; he rapidly loses flesh; yet his appetite may be as good as usual, and his functions go on regularly. It is soon perceived that once or twice a day he gets a change; about noon a shivering comes on, and lasts perhaps for half an hour, during which he looks pale, and his countenance drawn in; after this the warmth returns and the heat soon increases beyond the standard of comfort, particularly in the palms of his hands, &c., which have a peculiar biting hot feel. There is nothing in this cold and hot stage of hectic like the corresponding

symptoms in most other fevers. He may, without arousing any particular attention in his attendants at the incident, get his chair drawn nearer to the chimney, have the fire stirred, and something wrapped round his feet: by and by, he complains that the fire is too brisk, moves away from it, has a screen interposed, causes the door to be left open, and that's all. Sometimes the chilliness returns during the hot stage, or there comes on the sweating stage, (which in hectic is not a general full perspiration over the whole body,) and on its subsidence leaves the patient pretty well until the next attack, which usually comes on about six or seven o'clock in the evening. The sweating is seldom perfect; it is generally over the chest and arms, but sometimes on the lower extremities alone; it is not like the sweat in some other cases, but a greasy kind of moisture. The appetite, as I have said, remains tolerably good, and the thirst is less than in other fevers. As it goes on, the patient still loses flesh and strength; the appetite begins to decline; his tongue continues clean, but redder than natural; his mind becomes easily excited; his pulse is about 90, seldom gets as high as 120; his countenance changes; his forehead seems larger, from the falling off of his hair; his eyes get a pearly white appearance, and sometimes are peculiarly brilliant; he flushes often, or there is a circumscribed redness on one or both of the cheeks; his nose is drawn in, and his finger nails become incurvated. A colliquative diarrhœa generally occurs in the morning, and when this is the case he sinks rapidly; not, indeed, as some imagine, from the consequences of the diarrhœa itself, but from the extent to which the fever has arrived. He will complain of a slight sore throat perhaps, and on examination, a number of white specks called aphthæ are seen on

the soft palate, or perhaps on the tongue, or under the tongue ; or what is more frequently the case, there will be seen a large ulcer in the throat. When these aphthæ, or this ulcer appear, you may despair of your patient—he will not recover. Towards the close he is worn to a skeleton, and is as weak as an infant. Although the intellect remains little impaired until a short time before death, when there is a slight delirium, his mind partakes of the general weakness ; his legs become œdematous ; his urine comes away insensibly, and he no longer calls for the bed-pan ; he falls into slumberings, and at length dies off exhausted—often so quietly that those about his bed may be awhile unconscious of the event.

During the whole progress of the fever, the patient entertains the most sanguine hopes of his ultimate recovery. I had an intelligent pupil in this state once, who, if he had seen any other persons in the same condition as he then was, would have immediately pronounced the impossibility of their recovery, yet to the last he had no idea of his approaching dissolution. I know of no other disease but hectic fever where this unconsciousness of their fate remains so long. Quickness of the pulse is not an essential character of hectic ; I have known it natural all through, except during a paroxysm, or some temporary excitement. There is one thing in hectic that removes all doubt as to the real nature of the fever, it is this—if in the midst of the hot fit he suddenly relapses into a cold fit, you may be sure it is hectic. I know of no other surgical fever where this occurs except urinary fever, in which the other symptoms remove all difficulty of distinction. In the beginning, the hectic has intermissions more or less perfect, but it soon becomes remittent—that is, never entirely subsiding. In some surgical diseases,

as cancer, this fever presents few of its prominent characters well marked, such as you might observe, for instance, in extensive disease of a joint. In some diseases you will see one symptom, as the diarrhœa, almost alone; in others, the sweating, and so on: in fact, there is great variety in its appearance and course.

Hectic fever is sometimes interrupted in its progress by pregnancy; the woman is respited until delivery, and then the fever resumes its course at the exact stage in which it was at the time of conception; but this is not always the case, for women do sometimes die hectic during utero-gestation. In the same way hectic, in phthisis, is sometimes suddenly arrested by mania, which may continue for three or four months, after which, the mind gets well and the hectic takes up the patient where it left off, and runs its course as it would have done had nothing occurred to interrupt it.

If the cause of hectic is slight, removing that cause will not remove the effect, for then it is plain that the constitution is predisposed to the fever, or so small a cause could not bring it into action. Suppose a strong country woman is brought into a hectic state from nursing too long, take away the child from her, and in three weeks she will be quite well; but suppose a woman in the same circumstances, but prone to consumption, removing the child from *her* will not remove the fever, but it will go on. The diet of a patient in surgical hectic need not be so much restricted as it should often be in one arising from phthisis; for instance, he may take animal food if it agrees with him. He will urge you, and so will his friends, to stop the purging which comes on, and imagines he will then be quite well; you prescribe the

ordinary treatment for diarrhœa, and it is checked, but is he relieved? No; for there comes on the sweating in bed on any little exertion, or without any obvious cause; you are then besought to do something for that, and what is the result? If you relieve him by the mineral acids, you will find that for the two or three days following the nights he has been without the sweats, he suffers considerable uneasiness, nor is he relieved until they come on again. Dr. Gregory used to relieve night sweats by a meat dinner and a pint of draught porter going to bed. It is an error to say that it is the colliquative sweats or diarrhœa that are wearing down the patient, for they are mere symptoms. It is the fever that wears him down, and that alone. Aphthæ indicate the last stage of hectic fever, as I before remarked, and where they are the patient must die; but take care you do not confound them with those aphthæ which some people have for years, and those to which children are very subject, but which are not dangerous: it is the hectic aphthæ alone which are so, and which are often found after death connected with ulcerations all through the alimentary canal.

MORTIFICATION.

IN speaking of the terminations of inflammation, I should have mentioned that in particular *kinds* of inflammation, and in particular *structures* there is a natural tendency to a particular termination. Thus a serous membrane has a tendency to adhesion when inflamed—a mucous membrane rather suppurates. Rheumatic inflammation *generally* ends in resolution, and there is rather a tendency in erysipelas to gangrene. But there are kinds of inflammation which

always end in mortification, or rather, I should perhaps say, in which the inflammation and its consequence run *pari passu*, such as Anthrax. There is in general an intermediate state between active acute inflammation, and the absolute death of the part, termed *Gangrene*, in which there is a chance of saving the part from sphacelus by a well-directed line of treatment; you see therefore that mortification is sometimes a consequence of common inflammation, and sometimes not. Let us take a case:—Suppose a healthy man gets a compound fracture of his leg, which is to end in mortification, how does he go on? For the first two days there are no symptoms which indicate the approaching mischief: on the close of the second day there is more pain in the part than there ought to be in a simple case; in a day or two more the skin becomes livid and then black; it loses its consistence, it gets flatter, spreads, and is without any well-defined border; the cuticle separates; the feel gives a crackling sensation to the fingers; where the inflammation has gone up to the knee the whole thigh may be enormously swelled, and have the crackling feel throughout; the pulse becomes quick and weak, the full inflammatory face sinks, and the countenance gets pale and covered with a greasy sweat; there is great anxiety and constant vomiting: generally until the latter stage, the mind is not affected, but sometimes there is delirium ferox; the stomach continues to reject everything; the patient tosses his limbs about; after a little he ceases to have any pain in the limb, and he appears to be getting better, but the pulse is weak, and when gangrene sets in, he seldom survives three days. When the patient is to recover, on our coming to him in the morning we find him better; his pulse is fuller, and he has gotten some rest during

the night ; the margin of the mortified part has become defined, and a red line, the adhesive inflammation, appears round it, which increases ; specks of ulceration form in it, they coalesce one with another, and at length form a ring of ulceration which passes deeper and deeper until at last it casts off the slough. This red line never shows itself during a high degree of inflammation ; if high inflammation should supervene after it has formed, the red line will vanish, and the mortification will soon go on as before ; but a new line may afterwards form, and again bound the inflammation. Sometimes a kind of gangrene comes on after ten or twelve days of fever, without the patient giving any warning, except complaining of cold in the limb ; in this case the line of separation soon forms, but the separation of the slough goes on very slowly. If you amputate here, the operation is painful, and the skin won't retract ; yet you must operate in such a case however : such a case as this usually arises from cold and damp. Parts receive mortification in the same proportion as they would do ulceration ; thus a tendon will neither mortify nor ulcerate as soon as some other parts. A smell like that of putrefaction is sometimes emitted from a mortified part, but the two processes are very different, though some have fancied them the same, and from this cause have recommended antiseptics in various ways for the treatment of mortification. Effused blood will put on something of the appearance of mortification in a part, and even vesicles may come on its surface, so as to lead careless observers into mistakes as to what it is ; but if it is blood the constitution is not disturbed, nor is there the great pain in the part that there would have been if it were mortification ; certain states of erysipelas are very like gangrene in appearance, but they may be distinguished

by the nature of the accompanying fever. The prognosis in mortification will depend more on the constitution of the patient, and the way in which it commenced, than on the apparent extent of the local injury; when mortification is preceded by high inflammation, and is the consequence of it, the prognosis is worse than when it is the immediate result of violence. Our treatment must be guided by these considerations. When mortification is the result of inflammation we should not amputate until the line of separation is formed, for the high constitutional disturbance present would destroy every chance of favourable result. When death takes place in a limb *immediately* after the receipt of an injury, such as by a cannon-shot, we may amputate this limb, after the first shock is over, without waiting for a line of separation between the dead and living parts to be formed. The patient has no chance of surviving amputation when the gangrene is spreading, and the fever high, and before the line of separation has formed. When you see a part hastening to gangrene you must treat the case as one of high inflammation; even if there should be vesicles on the part you must bleed the patient, and repeat it should the pulse have the inflammatory character, instead of anticipating the debility that is to follow, by giving stimulants and antiseptics. In the *worst* cases, if you give wine, it will not rest on the stomach; what, then, are you to do? Give burnt brandy, or tincture of opium in mint tea, where stimulants are really required. Great reliance is placed on fermenting poultices on mortified parts; for my part, I do not think one poultice much better than another; in the latter stage perhaps a carrot poultice would be useful. No one now thinks of scarifying a mortified part, although at one time the only dispute was as to the depth your

incisions should go. After the line of separation between the dead and living parts is formed, we are still not certain that everything will go on right; for if the constitution be bad, or the case be treated injudiciously, the mortification may pass this and go on again, as if no such line had been formed; you may be able to satisfy yourself that the line of separation between the dead and living parts is in progress of formation before you can *see* the least sign of it—if the gangrene is spreading the margin will not be defined to the touch, but if it is about to stop you will feel a slightly elevated and hardened ring where the line of separation is beginning.

Bark has been thought by some to be a specific in mortification; but it is not a medicine to be poured into the stomach in every case of this kind; in fact the stomach will not retain it. When the fever has entirely ceased, bark will be then found a valuable remedy, but not until then; should it cause an inordinate thirst, or a foul tongue, it must be immediately discontinued; sulphate of quinine bids fair to supersede the common bark; it rests easier on the stomach, its bulk is small, and the patient is not obliged to swallow a quantity of inert matter.

The exciting causes of mortification are sometimes extremely slight; for instance, if a patient, labouring under anasarca, gets a scratch of a pin, or a surgeon punctures a part with a fine lancet to let out the fluid, in the great majority of cases this scratch or puncture will end in mortification; in another individual mortification will extend from a common boil. It is a curious fact that when gangrene arises from these slight causes its progress is much slower, and when it is to end fatally the patient lingers longer than when it attacks a robust healthy man.

There are causes independently of any local injury which produce mortification. I have heard it remarked by persons connected with large lunatic asylums in Ireland, that the unfortunate inmates of those institutions are particularly subject to mortification of the feet, without any apparent local circumstance to account for it. Excessive cold of a part will cause mortification of it, but sometimes a much less degree of cold than that of freezing will do it. A man, suppose, gets a fever, which, as it is the fashion, we must call typhus; well, on the eighth or ninth day one of his legs is observed to become colder than the other; it is not merely that the patient himself feels it colder, but there is an actual reduction of its temperature; the next day perhaps it is insensible; sometimes no pain is felt in the limb, and very rarely is there any considerable pain; the leg has sometimes a fulness in it, and sometimes it is shrivelled, and it quickly falls into gangrene. Cases of this kind have occurred where the foot mortified, and dropped off at the ankle, after a slow process. The most we can do generally, in such cases is, when we feel one of the bones perfectly loose, to remove it gently with a forceps; or if the gangrene, suppose, stops at the middle of the leg, to wait with patience until the ulcerated surface of the living portion looks clean round the tibia and fibula, by which alone the inferior portion is retained, and then to saw through the bones and liberate it. I have never, with but one exception, known this occurrence to take place in those who were comfortably lodged in a wholesome dry place; it is always among the poorer classes; I have never, in the higher classes, known an individual lose his limb from fever, but my experience of fever among the wealthy is very limited, it being chiefly derived from hospital practice. Well,

how are we to treat such a case? not by antiphlogistics certainly; the only thing to be done is to prevent any moisture being put to the limb, and to keep it warm with hot flannels, &c. Suppose you were to go to amputate this limb you would find it the most troublesome and the nastiest operation that can well be thought of. Sometimes in fever the skin covering the prominences of the scapula, scrotum, hips, trochanters, &c., becomes excoriated, gets red, and becomes mortified in the centre; this arises from pressure and extreme debility, and the most you can do is to apply cushions of curled hair in chamois leather under the hollows of the body to equalize its weight on every part; local applications to the mortified parts are worth nothing, but when they first become red you might apply spirits, either alone or mixed with vinegar, and this will often stop the progress of the local affection. When the cuticle is abraded, lay a thin sheet of gold-beater's leaf on the part; white of egg spread on linen or thin leather will be found useful to prevent these abrasions. After the fever has subsided and the patient is getting well, perhaps getting fat and walking about, still one of those gangrenous spots may show no disposition to heal; should the part be the prominence of the sacrum and the slough be attached to the tendinous aponeurosis covering it, don't be in a hurry to take your instruments to cut it off. If you do, tetanus will in all probability be the consequence; cutting off sloughs in any case, except where they are completely detached from the living parts, and only retained by their continuity with a small portion still connected below, is a foolish and very dangerous practice. I knew a young surgeon, who getting impatient at the slough of a caustic issue he had made, not separating as soon as he

thought it ought, took a scissors and cut it off, and the patient died of tetanus. Gangrene from cold comes on in two ways—A person, for instance, walking in very cold weather on ice, without shoes or stockings, finds, in the evening, a stiffness in his leg, and without any very apparent pain or inflammation it falls into gangrene. While in another such case a very high degree of inflammation takes possession of the limb before the gangrene occurs. In a part affected by excessive cold you must not apply heat suddenly; its vitality has been lowered, and is therefore unable to bear the stimulus of heat in the first instance, as it would cause the death of the part. You must make the transition to its natural temperature very gradually and cautiously. If a part be in a state of high acute inflammation, we should be equally cautious of applying anything to it that would be likely to reduce its temperature too rapidly, such as ice; the *cold* in this case would likewise be too strong a stimulant for the power in the part to resist its excitement, and the same consequence would follow as the application of heat in the first instance to a frozen part. Your first application, then, perhaps will be snow, the next cold water, then water a little heated, and so on; these should be applied with friction. Notwithstanding our best care, should reaction set in too violently, we have then only to treat the case as we would one of common inflammation.

Tight ligatures or bandages round a limb will cause mortification. A man, suppose, gets a simple fracture of his leg, and an unskilful person puts a bandage very tightly on it; in twelve or fourteen hours the patient cries out with great pain, and if the bandages are not quickly removed, that limb speedily becomes gangrenous. Gangrene, as I have men-

tioned, sometimes occurs without any fœtor, and the part becomes dry and shrivelled up; the patient's health is not much affected, and he walks about with this limb, which he no more feels or can use than if it was a piece of timber hanging to him. It is the effusion of serum which takes place in gangrene from inflammation that causes the fœtor; in this dry gangrene it is the want of moisture that causes the absence of fœtor. Sometimes, although very rarely, a limb attacked with dry gangrene, does not become black, but dies of a white colour.

In the *Dry Gangrene of old people*, the upper extremity is, I think, more commonly its seat in women, and the lower extremity in men. You will see it sometimes commence at the extremity of the finger, which becomes perfectly white at first, and then more or less livid; then it begins to be painful; the fingers get small, become shrivelled and dry. It generally attacks two or three, or all the fingers of the same hand; its progress is usually very slow. In such cases wine and bark are to be given; the bowels are to be kept *moderately* free; and the patient to make use of animal food of easy digestion. The local treatment should consist of gently stimulating embrocations, such as warm camphorated spirits or spirit of turpentine, and we must endeavour to maintain the natural temperature by warm flannel; an opiate should be given occasionally to moderate pain when it becomes severe. The shrivelling up of an entire limb is a thing of very rare occurrence. Although it has been more commonly observed in people at or after the middle periods of life, it is not by any means peculiar to any particular age. It is not preceded by fever, but the first thing observed is the drying up of the limb, which at length gets black, without being

attended with pain, but only a sense of weight in it; it slowly creeps up, without any bad smell, any discharge, or any disposition to separate spontaneously; and for months of its progress the patient will continue to enjoy good health. There is here no occasion for us to be in a hurry with our assistance; surgical interference by incisions, &c., is very bad practice at first—it can, in fact, be of no service. This affection is more frequently seen on the continent than with us, and would seem to depend greatly on poverty of diet. It is to be found, however, in every rank in life.

LECTURE III.

POTT'S GANGRENE—CANCROUM ORIS—ERYSIPELAS; MODES OF ATTACK; TREATMENT. CHRONIC ERYSIPELAS—ERYSIPELAS OF INFANTS.

THERE are some cases of Mortification not referable to any of the kinds I have mentioned, but which partake somewhat of a specific character; among these is what is called POTT'S GANGRENE. This disease is not met with in early life, and it seems to attack men oftener than women; I never saw it in a person under the age of forty-five, and very seldom under sixty-five years. In my experience, hard drinkers are more subject to it than others. The first symptom precedes for a longer or shorter time the local appearances; the patient complains of violent rheumatic pains, or pains exactly resembling rheumatism, but on examination there is not the slightest appearance of redness in the parts; the pain, which is most intense, generally begins about three o'clock in the day. This may be the only symptom for months, and the patient may get well of them for a time, even so long as for six months, and then the gangrene comes on. The first appearance is a blue vesicle, which generally forms on the inner side of one of the toes, sometimes on the under side of the toes, but very seldom on their upper surface; the cuticle is higher than the level of the surrounding skin; when this separates there is seen a dark coloured ulcer with a hardened base. Although this is attended some-

times with severe pain, yet the constitution suffers but little; in fact, not more than what you would expect from the want of rest. The sloughing and ulceration spread with greater or less celerity, but in general the progress is slow. From the part first attacked it gradually seizes on the other toes, then on the tarsus, and so on to the ankle. When it comes to the first joint, separation of the mortified part begins, and the joint hangs by one of the tendons; do not on any account cut this tendon, nor, as some advise, take it in your forceps, and twist it off. It would answer no useful purpose whatever, but would render the subsequent progress of the disease much more rapid, and what is still worse, might bring your patient into immediate peril of his life. As soon as the separation begins in one part, the pains return, and the disease goes on as at first, to the destruction of the next, and thus it may continue to intermit and recur for two or three years, or even more, before all the toes are gone. During all this time the patient enjoys tolerably good general health, and except when in pain feels little wrong with him.

Pott thought he had discovered a specific for this complaint in opium, and wrote on the disease with the view of recommending it, but experience has not confirmed the confidence in the medicine which Mr. Pott's paper at one time raised in medical men. It is necessary to relieve the severe pain, and for this you must give large doses of opium, and it is only from extremely large doses that any benefit is obtained—but, except for this object, opium does no more for this disease than for any other species of mortification. The limb is to be kept in the horizontal position; warm stimulating applications are to be used on the part, and by these

means you may keep off the disease for months, although it will eventually recommence its career. You will at times find that emollient applications or fermenting poultices give the patient ease, but sometimes either will be found to increase the pain. I have seen an affection resembling this in the fingers of women, the first symptom being a preternatural coldness in one or two of the fingers; should you find it in this stage all you have to do is to keep the hand warm, and give good diet. I met it in one woman of indolent habits in whom it began with violent pain in her arm, gangrene came on, it was stopped afterwards, but from beginning to end there was never pain in the part itself.

There is another variety of mortification called *Cancerum Oris* found chiefly in children—very seldom, however, among those of the wealthier classes, but among those feeding on poor, unwholesome diet—and left, perhaps, neglected in their wetted clothes or bed, habitually. So frequent was this disease in the Foundling Hospital, that it was considered a kind of endemical complaint there from year to year. Children that appear particularly subject to exanthematous diseases are not unfrequently affected with this also. The first symptom perceived of it is a fulness in one of the cheeks, and if you put your fingers into the child's mouth, and feel the part from within and without, you will find that the cheek is really thickened; there is no particular redness to be seen in it on the outside, but after some time a red line appears forming around the tumefied part, and sooner or later all within that line will slough out. Sometimes the whole cheek will come away, and the disease often proves fatal. At first all you can do is to poultice the part and sustain the child's strength by suitable

nourishing diet—attention to cleanliness, warmth, &c., and the exhibition of bark and other tonics. When the slough separates you are to endeavour to arrest the further progress of the disease by pencilling the edges and surfaces with strong muriatic acid, or, what I prefer, the muriate or butter of antimony.

ERYSIPELAS.

THE right understanding of the peculiar form of inflammation called Erysipelas, is of great importance to you; as in certain constitutions it will thwart the best designed and executed surgical operations, and may convert an otherwise insignificant injury into a very formidable one. It is by far more immediately connected with the patient's habit of body, than with the cause immediately producing it; bears no certain relation to that cause in the severity of its attack, and in fact often arises in a part without any obvious local cause whatever. It is either idiopathic or symptomatic. In some cases I consider the local appearance of erysipelas as a mere symptom of a peculiar fever. In idiopathic cases there is sometimes no fever whatever accompanying. There is observable in some a peculiar disposition to it, and when it is thus constitutional it is a very dangerous complaint. Although erysipelas has, not without some reason, been considered a disease, the proper seat of which is in the skin, yet it sometimes appears to extend itself into the subcutaneous cellular membrane, and is then called, on account of its mixed character, *Phlegmonous Erysipelas*, and this is the very worst form of the disease. But however it may arise, or in whatever form it presents itself, it differs very much from pure phlegmon.

Erysipelas will have, in the great majority of instances, its boundary defined by its colour—there are some cases of it, however, that I shall have to speak of in which the colour extends far beyond the actual disease ; in phlegmon, as I have before mentioned, the boundary is perceptible to the touch—the hardness of the adhesive inflammation. Erysipelas may begin in the hand or the foot, and gradually creep on to the trunk ; phlegmon remains where it began, and only enlarges—the first part affected continuing inflamed. The fever attending or ushering in either are very different.

Erysipelas comes on in various ways. Sometimes a person is attacked by an exanthematous disease, and this ends in erysipelas ; this is an idiopathic form, and belongs to the physician. In a symptomatic form, a man will be seized with a violent shivering which will perhaps last half an hour, and shortly after an eruption will make its appearance ; the pulse is often full and hard, the tongue yellowish, but as matters proceed, becomes of a perfect mahogany colour ; there is very great thirst ; sometimes delirium ; the inflamed part is hot, but without that feel of tension there is in other cases. The fever, then, you observe, precedes the eruption, and it may be even of two days' continuance before the local affection appears, but that is the longest period ; it is more violent, and more affects the digestive organs, particularly the liver, than the fever of phlegmon, and is more uncertain in its duration than any other fever. For some days before the actual setting in of the fever, the system will give some of the premonitory symptoms of approaching mischief. The patient will feel a lassitude, drowsiness, and dislike to exert himself ; his digestive organs, and particularly the liver, will suffer some derangement ; his sleep will be disturbed

and unrefreshing, and his appetite fastidious and bad, or he may have nausea and vomiting ; he cannot apply his mind to business, and will often complain of a dull uneasiness in his limbs : but with any or all of these things, you can't say positively that what is to follow will be erysipelas. The fever does not subside on the coming out of the eruption, but on the contrary, is often much increased, differing in this respect from most other eruptive fevers. The erysipelatous fever sometimes sets in with high delirium, and sometimes with coma, as other fevers do. Delirium or coma coming on *before* the local inflammation appears, seldom indicates anything dangerous ; but if the eruption sets in with slight constitutional symptoms, and if after lasting two or three days, that then delirium or coma comes on, that patient will die. When the tongue is brown, dry, and hard, with the fever going on, the case is very dangerous.

Now, we are told it is difficult sometimes to decide whether the case be phlegmon or erysipelas ; I do not at all think so, but if a symptom *be* required to distinguish between the two inflammations, it will be found in this—that in erysipelas there is no *hardness* in or about the inflamed part, as there always is in phlegmon. The redness over an erysipelatous surface is uniform at first, but if it becomes cloudy, is broken up into detached spots, you may be sure the disease is about to give way. You will next see it become yellow, and finally, the cuticle scales off. In some cases vesicles form on the inflamed surface, and where on their bursting you see a new cuticle formed underneath, you may consider this not at all a worse case than where there were none ; but when there is a great deal of pain in the part, these vesicles generally degenerate into foul ulcers, occasionally gan-

grenous. Now, although this is often a bad case, yet it is not always so; they sometimes do not spread, but get better from day to day, and in the end the patient will do very well.

The time an attack of erysipelas is to last is very variable; in no case will it end before the expiration of five days, but it sometimes goes on for twenty or thirty days, or may even last for six weeks. There is, certainly, no crisis remarked in the disease; you see your patient, suppose to night, and you find his tongue of a perfect mahogany colour, perfectly dry, and all his symptoms worse; yet the next day you find him better to all appearance—his tongue moist and cleaning, and he improves from day to day, until he is quite well. When the local affection goes on with little constitutional disturbance, the case is a favourable one; but when it is preceded by high fever, and that this continues some time, where there is delirium, or where the tongue is dry, brown, and hard, while the fever is going on, the case is very dangerous. Sometimes the eruption suddenly disappears—the pulse sinks, the patient falls into a lethargic state, and dies, apparently from debility. You will find it laid down in books, that when the erysipelas ends fatally, it is by its receding from the surface to some internal part. Now, this is never the case. I have examined several after death who died of this disease, and have spoken to others who made similar investigations, and never saw anything to bear out this opinion myself, nor heard of it from any one who did witness an instance of it. It is necessary to be aware of the fallacy of this notion, for it has had a very injurious influence on practice, by preventing the employment of the most useful remedial measures. In the commencement of erysipelas there is a high

degree of inflammatory fever : the pulse is full, hard, and beats as high as 100 or 120 in a minute. Here you might be inclined to employ strong antiphlogistic measures—to take a good dash of blood from the arm, and so forth: but this is hardly ever necessary, and often would be highly injurious. If you have such a pulse in the beginning of erysipelas, with irritability of stomach, give an emetic, and the pulse immediately becomes soft and regular. Such a pulse here does not arise from inflammatory action, but depends on some cause originating in the stomach and bowels. Give large doses of tartar-emetic: you need not be deterred from causing full vomiting by the apprehension of a blood-vessel being ruptured, &c.; and you will find it is the only thing to be relied on. After you have cleared out the stomach, you will continue the tartar-emetic, as advised by Dessault, in small doses, such as will affect the skin. Purgative medicines are also very useful to remove bile; and I know of no one better than another, except that which remains best on the stomach. You will give acid drinks to relieve the patient's thirst, and keep him moderately cool; but, remember, pure erysipelas does not require bleeding, however the state of the pulse may seem to demand the lancet. When the fever is of the typhoid kind, you will not, of course, attempt any mode of treatment calculated to reduce the fever, or patient, no more than you would in such a fever from any other cause. On the contrary, you must administer wine, cordials, &c., to support his strength. Now, bark, which is so useful in other apparently analogous depressions of the system, does not, according to my experience, do much service in these cases. There are many affections which bear a resemblance to erysipelas, and

among these is rheumatism; and I am convinced that many of those cases said to have been cured by bark, were of this description, and not true erysipelas.

With regard to local applications to this form of inflammation, very little can be done—warm fomentations, poultices, and other relaxants, are inadmissible, except, perhaps, where it comes from a wound. They do not even give comfort—they are not liked. The distressing heat may be moderated by cool lotions and mild astringents, such as solution of acetate of lead; dusting the part with some fine powder, as flour or hair-powder, is often very soothing and grateful to the patient. Should the erysipelas be followed by ulceration or gangrene, just treat the ulcer or gangrene as you would similar ones from any other cause, except in the greater caution as to bleeding, or the too early exhibition of tonics.

While in such cases as those almost our whole attention and treatment must be directed to the constitution, there are cases where erysipelas is a purely local complaint, such as that, for instance, which comes from a wound in an aponeurotic structure, and where our treatment also must be chiefly local—not such, however, as we employ in phlegmon. We shall have a good example of such a case in a particular wound of the scalp producing erysipelas, where the local treatment is almost all that is necessary to give any attention to, as far as the erysipelas is concerned. Wounds connected with tendons, and particularly punctured wounds, are attended with erysipelas; but no one, in such cases, would think of minding anything but the wound itself. It is of the first importance, therefore, to distinguish between an erysipelas arising from a wound, and produced by the nature of that wound, and one which is caused by a deranged

state of the constitution, and only excited by the wound, which itself may be a very trivial one.

A man—with or without wound or ulcer on his leg, suppose—perceives a little redness on the dorsum of his foot: this, by degrees, spreads upwards on his leg, and looks like erysipelas; but in my opinion it is not true erysipelas—it will be found to be a deadening of the cellular membrane, and the skin only inflames from being placed over it—it acting as a foreign body: for as this simple inflammation proceeds, the skin gives way, and shows a quantity of sloughy matter beneath. When this is discharged, the skin affection gives no further trouble. In Phlegmonous Erysipelas, it is an excellent rule to make early incisions; but as long as it is confined to the *skin*, no such thing should be attempted. Now, discussions have arisen as to what length and depth these incisions should be carried, as if their extent was a matter of the chiefest importance; but you will easily perceive how far the circumstances of each case will require them to be carried, and there can be no fixed rule on the subject. All you have to do is to make them of sufficient extent to let out the sloughs or matter: anything short of this is doing nothing—anything beyond it is doing too much.

On the going off of Erysipelas, it sometimes leaves a fulness behind it, which pits on pressure like anasarca, but which is readily distinguished from it by the thickened and roughish cuticle. Now, it is a remarkable fact, that if the skin be left in this morbid condition, it will be attacked a second time with erysipelas at some future period—it may be in three, six, or twelve months, but it will not escape another attack, one that will be more severe than the first, and which will leave a still greater fulness and thickness

than the first did. When this happens, the patient will, in my opinion, be subject to returns of the malady for the rest of his life. Such a disease I should be inclined to call *Chronic Erysipelas*. I have tried everything I could think of to cure this chronic form, and although in every trial I produced an amendment, I never completely succeeded with the existing affection, or in preventing a return of the erysipelas in its more acute form.

After recovering from erysipelas, the patient should be warned to be very careful of observing strict precautions in his habits of life, for some time at least. His bowels must be kept in good order; he should take moderate exercise in pure air, use light and simple diet, and avoid anything like intemperance in drinking. Should the attack have been in a limb, it will be often necessary to employ gentle frictions, and perhaps a roller round it.

If the Erysipelas should have been in the scalp and face, which it not unfrequently is, the hair will fall off as the patient recovers, and will continue to come away in the comb for some time after he is perfectly restored; now, this should not be neglected, for if it should be, the hair may not grow again on that part. The best way to avert such an unpleasant deformity, is to have the head shaved two or three times, with the interval of a few days between each time.

In *infants* there sometimes appears a kind of erysipelas which may even be born with them; it begins in a slight redness about the navel; its progress is wonderfully quick, extending in every direction, but in some cases it ends fatally before it attains the size of this watch; it has not the soft feel of erysipelas in other cases, but resembles exactly the feel which you all must have one time or other observed a subject

in the dissecting-room to have in frosty weather ; this will remain four or five days, and the child's constitution will appear to suffer very little ; if the inflammation spreads it dies rapidly, and the inflammation will be observed to have extended to the peritoneum. Do not believe the nurse when she tells you it is better or worse, but look to the symptoms. The best treatment is bark, exhibited in every way you can ; by the mouth, by glysters, and by lotion. This disease sometimes makes its attack on the infant's buttock. I have said it may sometimes be born with the child ; in a case I saw a few days ago, it was of six weeks' standing, and although the redness extends half over the body, the real erysipelas is only an inch in extent. You cannot treat those affections in infants according to the ordinary rules for treating erysipelas ; you must avoid much purging or nauseating remedies, and, as I have said, your great reliance must be on bark.

The question has been started whether erysipelas be contagious or not, and it has been adduced in proof of the affirmative, that several people in the same ward of an hospital will be attacked with it at the same time, without any obvious cause, and where there was no want of cleanliness and care ; but this is only a proof that there is some general predisposing cause, with which we are not acquainted, operating in the case. The greatest number of cases occurring in Ireland at the same time, have been remarked to be during the prevalence of very warm and moist weather. Those who believe in fevers being contagious, may, by the same train of reasoning, believe erysipelas so too. It is certainly remarkable that a number of cases will appear at the same time in an hospital in an unaccountable manner ; and surgeons at such a time will delay performing any operation

that can be delayed, for days and weeks, knowing the great risk the patient will be in of getting erysipelas from their incisions. I have been told by a navy Surgeon that erysipelas has broken out in his ship, and that although the utmost attention was paid to cleanliness, ventilation, &c., a great many of the sailors were attacked by it without any visible cause, and that after it had continued in this way for three months, it went away of its own accord, with as little apparent reason as it came. Common fever is another thing which has been often mistaken for erysipelas; it was a remark of Dr. Harvey that there was never an epidemic fever in Ireland that was not followed by numerous cases of erysipelas in the hospitals.* If in fever a partial redness appears in two remote parts of the body at the same time, that appearance is certainly not true erysipelas, it is only a symptom of the fever, and one which when it occurs is generally a sign of the fatal termination of that fever. Erysipelas never in any case appears in two separate parts of the body, as a leg and an arm, at the same time, except by continuity; wherever these erysipelatous appearances are contiguous, but not continuous, it is not true erysipelas.

* For several years it has been remarked in the Lying-in Hospital, Britain-street, that Puerperal Fever and Erysipelas frequently alternate with each other—the latter being, in such cases, situated about the vulva and buttock.—*Ed. of Lect.*

LECTURE IV.

CONTUSION—WOUNDS—SIMPLE INCISED—LACERATED—
PUNCTURED—GUNSHOT WOUNDS—NERVOUS AFFEC-
TIONS FROM WOUNDS.

BEFORE we speak of Wounds, we will say a few words about *Contusion*, by which term is meant an injury inflicted by a blunt instrument, without necessarily causing a solution of continuity in the skin. The effects of this kind of injury are sometimes of the most alarming and dangerous description—the viscera of the great cavities may be ruptured by a blow or fall without any appearance externally to indicate the mischief: so, likewise, bones may be fractured, or even broken into small bits, as by a cannon-ball, without the slightest apparent injury of the skin over it. But they are not always of so grave a character, or indeed commonly; the most trivial consequence of contusion is a slight tumefaction unattended with pain, except for the moment, and a discoloration of the skin, owing to an effusion of blood of trifling amount, called ecchymosis: this is generally what happens when the place injured is over a thick cushion of muscles or other soft parts; it requires little attention—the swelling soon subsides—the black and blue colour of the skin fades into a yellowish hue, and gradually disappears entirely. The contusion may, on the other hand, be just sufficient to cause immediate death of the skin, or cellular membrane, or a bone; or merely excite inflammation in them, which may or may not end in gangrene.

A contusion which causes a tumour, as, for instance, over a bone, acts in this way—the parts immediately under the skin elude the injury by their softness, but the structures connected more directly with the bone suffer from the unyielding nature of their support, the little blood-vessels are ruptured, and blood is effused through them. Now, the whole of this blood, whether coagulated or not, is speedily surrounded by coagulable lymph, and the cure is afterwards effected by the absorption of the blood by this lymph, and the sides of the cavity are consequently brought nearer together, until it is entirely obliterated. If nature does not take this mode of reparation, inflammation comes on, the skin gives way, the blood escapes, and suppuration of the cavity follows. These processes being somewhat tedious, and the latter very disagreeable, the surgeon is called on to do something. If, after a few days, the tumour seems sluggish, we may apply a gentle pressure, but not to such an extent as to cause pain. A moderately stimulant or evaporating lotion may be kept constantly on the part to promote absorption, and to repress any tendency to inflammation; this is all the necessity of the case requires, and all you can do with propriety. In some situations, contusions will produce effects peculiar to the part injured, and for which you should be prepared in delivering your opinion on even an apparently trifling matter in itself; for instance, a blow on the forehead, on or just over the eyebrow, may cause loss of sight in one or even both eyes, and ignorant people will be as likely to connect the occurrence of this catastrophe to the want of skill in the surgeon as to the blow, if not more so; for the eye itself may not have been hurt in the first instance.

If an incision be made into a bloody tumour *early*

a dangerous inflammation and fever is excited, but if, after two or three weeks, the tumour should appear to remain without any apparent alteration, it must be opened, and the blood be pressed out. At this period the parts are ready for the adhesive inflammation; you have therefore only to press them gently together with a compress and bandage, and the cavity will be obliterated. There is a reason given for opening these tumours early—namely, to prevent the occurrence of inflammation when it seems inclined to take place; though we may open it from such a motive, yet, in my opinion, it would be better to let it break of itself, and not roughly to squeeze out the matter or blood when it did break. If there should be a great deal of pain in one of these tumours, you might open it on the third or fourth day. Although the consequences of this kind of injury may at first appear slight, you must be cautious in your prognosis to the patient or his friends, as it may become a very serious accident; for though the skin is not much hurt, the periosteum of a bone under it *may* be, and if the patient be of a bad constitution, it will induce a bad inflammation, and ultimately degenerate into a foul ulcer.

WOUNDS.

A Simple Incised Wound was formerly treated in a very rough way, and still, simple as it is, there is some difference of opinion on the matter. You are told by some to leave the wound open until the bleeding stops; for that ever so small a quantity of blood remaining in the wound will interfere with its union; however this be, you cannot, in most cases, prevent a little blood oozing between its lips, and numbers of such wounds have healed rapidly with little or no

trouble. You are therefore not to mind all this, but at once close the wound, and that will be sufficient in itself to stop the bleeding, even when so large an artery as the coronary artery of the lips is divided. Having brought the lips of the wound together, you are to take means to keep them so by strips of adhesive plaster and bandages. Now, in many situations, the chief object of your attention, to maintain an easy apposition of the lips of the wound, will be position. Suppose a person is cutting bread, and that the knife slips and inflicts a deep wound between the thumb and forefinger, here you need not apply anything but a little dry lint, bandage the thumb lightly to the hand and leave it so. Sometimes, from the shape or other circumstances connected with the wound, you may find it necessary to apply a point or two of the interrupted suture to keep its edges together. Whenever they can be done without, you will not employ sutures of course, and where you must, you will use as few stitches as possible. You take a ligature of the proper size armed with two curved needles, and pass one of them through the skin from within outwards, you then pass the other through the other edge exactly opposite to the first, and having disengaged the needles, and got the wound brought neatly together, tie the suture moderately, and assist it with compresses and adhesive plaster. In very deep wounds in fleshy parts, another kind of suture called a Quill Suture has been recommended with the view of keeping its sides together at a depth which the common interrupted suture could not act upon; but if compresses at each side of the wound, bandages and position, do not attain the object, other means will be little likely to do so. You are told not to put sutures in muscular parts, and it is a good rule, but there are

exceptions to it, as, for example, after the operation for hare-lip.

When, after a day or two, you think everything is going on well, and the wound is healing, its progress may be stopped, and even what had been effected be undone, by the wound getting inflamed, through some indiscretion on the part of the patient, or from some other cause. Here apply emollients to the part, bleed the patient if necessary, and clear out his bowels : perhaps it may be necessary to apply a few leeches about the wound. This you may find it necessary to continue for two or three days ; the lips of the wound may have separated a little and formed matter ; but your hopes of healing the wound by the first intention are not over—just draw them together and keep them so with sticking plaster, light compresses and bandage, and they will unite evenly and well. Suppose it was a wound to which it was necessary to apply sutures, they may cause it to inflame ; the wound will be tense and painful, &c. You will have little to do but cut out the sutures, apply a poultice for a while, and it may afterwards heal very well ; but, suppose you neglect to remove the stitches of suture, they will soon make their own way out, the wound will gape, and it must heal by granulation or *union by the second intention*. Sometimes when a wound, such as a flap wound, is nearly healed, the patient feels a painful spot somewhere in the flap ; this is the beginning of the formation of an abscess ; when matter is formed it may be punctured with a lancet and the matter let out. In a contused flap wound over a bone, the bone may be exposed, and you of course be unable to prevent its exposure. Here you may hope for the best, for granulations may spring up from the bone which will unite with the under surface of the

sound part of the flap, or it will be skinned over. A considerable discharge may come from this wound for a long time, and at length after examining it you find it is owing either to a bit of slough, as a crumb of exfoliated bone retained in the wound, on the liberation of which it quickly heals. Almost any structure in the body likely to come in the way of a cutting instrument, will, under favourable circumstances, heal by the first intention; but we have seen that even in a healthy constitution, a simple clean cut may be interrupted in this desirable process, which, although we call it adhesive inflammation, not only is deficient in most of what are considered essential characters of healthy inflammation in general, but is actually retarded or altogether stopped should those characters supervene from any accidental circumstances. Thus, the little wound made by a lancet in bleeding, generally heals without any sensation of heat or pain, or any swelling, and so will often much larger wounds; but if there be any indiscretion on the part of the patient, either in eating or drinking, or moving the part so as to disturb the dressings or the opposed edges of the wound, and that pain, heat, and throbbing results in the wound, its lips will swell and separate from each other, and adhesion is suspended, at least until these symptoms are removed by appropriate antiphlogistic treatment. But a certain degree of tone or strength in the part is also necessary for an organized union, and without it the simplest cut may degenerate into a foul ulcer.

Lacerated wounds are rarely met without more or less contusion; but a simple lacerated wound will heal as readily as a simple incised one, if the parts can be put evenly together in apposition. A man fell out of a window on a shed, and, as he rolled off

to the ground, his thigh was caught by a hook, such as butchers hang meat on, and received a large lacerated wound. The man sustained but little injury besides, and his wound, with proper care, healed as quickly as a simple cut of the same size would have done. Lacerated wounds seldom bleed much. I saw a boy whose arm got entangled with machinery, and was torn away from the trunk, and although the blood-vessels and nerves hung in strings from the wound, he did not lose an ounce of blood, and he recovered in three weeks without having a bad symptom. Any structure may be reproduced by granulations, particularly in early life. It has been objected that the colouring matter of the skin is an exception to the rule; the cicatrix of a wound healed either by the first or second intention, will be of a white colour in the negro for years, but it will be found to become as dark as any other part, in the long run; and although the mark of the old wound will, after a long lapse of time, be diminished to a tenth of its original size, there will be enough, after it has taken the colour of the surrounding skin, to show that some of it has been really reproduced.

Punctured wounds sometimes differ but little from simple incised ones: if made with a sharp instrument they may heal by the first intention, but if with a blunt one, such as the point of an umbrella, there will be likewise contusion. When the instrument that caused a punctured wound is withdrawn, the parts have a tendency to fall together, so that even a probe cannot be passed any distance into it, and therefore any examination of such a wound, to learn its course and extent, would be fruitless. You can form no opinion from inquiring the position of the patient when he received it, or from inspecting the instrument,

or by any examination of the wound itself; for let us do our best we cannot trust implicitly to what we are told of the transaction, nor put the parts exactly into the condition in which they were when the wound was made; they will have all changed their relative positions, and it is not often of any consequence in the treatment. Suppose a man gets a stab in such a direction, that a large artery may have been wounded, how are we to know that that artery has been injured or not? The patient or his friends may tell you that on getting the stab there was a gush of blood, and then that it stopped soon—and indeed if the artery *was* wounded, this is the very thing that might happen; but we cannot trust the information we get from them, for, in the agitation of the moment, they may be deceived themselves; a small quantity of blood may, in these circumstances, be magnified by their terror, and their not being accustomed to see blood spilled in any quantity; many such complications occur where it is next to impossible to know the extent of the mischief until some remote consequences, such as aneurism or gangrene declare it.

A stab by a sharp knife or the blade of a pair of scissors may heal by the first intention or by suppuration; sometimes it will not soon heal; a portion of the external opening is thrown off by sloughing; the discharge does not lessen, and it becomes fistulous in its entire extent. It has been advised to have punctured wounds sucked in order to draw out the coagulated blood that may collect in it; but this is an useless practice, for only that part of it which is very superficial can be extracted by such means. Sometimes in punctured wounds, about the third day, a violent degree of pain and fever comes on; here a dense fascia has been pierced, and matter is forming

under it; in this case immediately introduce a probe-pointed bistoury and slit up the fascia to a sufficient extent, and almost directly all these bad symptoms are removed. If the fistula caused by a punctured wound be in a direction favourable to it, you should employ gentle pressure with compresses and bandage along the whole line of its course, and the sides will often be got to unite; but there are of course situations in which this cannot be done, as when the wound has passed directly through a limb; in this case, if after a time, there should be little or no apparent disposition to heal, stimulating injections should be thrown into the canal: you need not be afraid that they will make their way any where but into the canal; they cannot, for it is lined throughout with coagulable lymph. It is a law in fistulæ, wherever situated, that though their surface does not show a trace of granulations, yet when you convert it into a simple incised wound, granulations will begin to form; you will therefore, where the thing is practicable, cut open the trajet of this fistula proceeding from a punctured wound, lay a little dry lint into it, and it will gradually heal from the bottom: if a fistula runs through a limb almost its whole diameter you may sometimes make a counter opening so as to convert it into a perfect canal, and this will assist its healing sooner or later.

It has happened that a person getting a prick of a pin in his finger will have that finger waste away, and not only the finger, but sometimes the hand and arm, up to the elbow. I believe this is owing to something wrong in the constitution, but I do not know what it comes from; warm applications, as warm water and electricity, often cure it, or check its progress. After you have done up a punctured wound in the best manner, it will sometimes get very painful—inflammation will

set in, and the consequent swelling will increase the tightness of the bandages to an insufferable degree, and if they be not speedily removed they may even cause gangrene. What you have to do, then, is to throw aside all your apparatus, subdue the inflammation in the ordinary way, and the case which looked so formidable will do very well, and the wound heal perhaps by the first intention without more trouble.

GUNSHOT WOUNDS.

Gunshot wounds are peculiar in many things—thus, a ball may carry into the wound pieces of cloth, a button, or a piece of metal that has been in the pocket; there is always more or less contusion in a gunshot wound; but if a ball passes through a limb, for instance, all parts of that wound will not be equally contused, nor of course be affected by the injury in the same manner: where the ball enters, will be much contused, in proportion to the velocity with which it struck, but where it escaped, will be more lacerated than contused, in consequence of the diminished velocity; the entrance wound will be extremely small, in proportion to the size of the ball, and its lips turned inwards; the exit orifice, on the contrary, will be large, jagged, and its lips protruded. If the ball strikes obliquely, a very slight force will turn it out of the straight course—I believe a fascia will do it, and hence it is that a ball may seem to have gone quite through the chest, or abdomen, or head, when, in fact, it has only glanced round it under the skin; it may come out, or be felt sometimes under the skin just at the opposite side to where it entered. Here, then, are two circumstances which materially influence the nature of a gunshot wound—namely, the greater

or less velocity of the ball, and the angle at which it strikes. If the ball strikes perpendicularly to the surface, and courses through parts of uniform figure and density, it will go for some distance in a straight line, but if it strikes at an acute angle it will readily change its direction, at the least change in the nature of the resistance it meets. It will be found of use to carry these facts in your recollection. If the ball, going with the maximum velocity, strikes the body, be it bone, muscle, skin, or any other animal structure, it will contuse the part; it may destroy the vitality of the part at once, or cause mortification in a secondary way. If it strikes a bone with great force it may go through it, leaving a fair round hole, the surface of which will, in part at least, exfoliate; if it goes with less velocity, and consequently strikes with less force, it may splinter it, or cause a longitudinal fracture; and if it goes with still less velocity and force, it may shatter it into several pieces; no matter whether the ball strikes a bone directly or obliquely it must necessarily contuse that bone so as to kill a part of it which must afterwards exfoliate.

Sometimes very little inflammation results from gunshot wounds, and sometimes a very high degree of it, and this will be found to depend mainly on the greater or less contusion the parts have suffered; if much contused the inflammation will be moderate, but if they be but little braised it will, *cæteris paribus*, run very high; if a foreign body be forced in by the ball, the inflammation will also be severe.

The prognosis in gunshot wounds is extremely uncertain; we are to treat it as a simple contused wound, to lay a little simple dressing on it, and a light poultice over that. The old surgeons thought these wounds were poisonous, later ones gave up that idea,

but from something peculiar they supposed to be in the nature of such wounds, from their tendency to gangrene, they thought it necessary to score the wound or to open the whole track of it, in order to facilitate its healing ; but if you take two persons who receive similar wounds in the same part of the body, and treat one of them after this method, and leave the other to nature, they will both, you will find, be well in the same time. The object for scoring the wound was to relieve the congestion which they saw was an accompaniment to gangrene ; if, however, a ball enters a limb, and that inflammation and tension of the fascia of that limb takes place, there will be great pain and sympathetic fever, and you must do here just what you would do under similar circumstances from any other cause—namely, introduce a probe-pointed bistoury and enlarge the opening of the fascia as far as may be necessary, and this, almost immediately, relieves all the bad symptoms. It will sometimes happen that a gunshot wound continues to discharge more matter, and for a longer time than you could suppose necessary for such a wound. You may be sure in this case that the discharge is kept up by some foreign body in it, and from this cause a fistula may form in the wound, and the discharge might even continue for two or three years, without the foreign body making its way out ; now, what are we to do here ? Why, just nothing, as regards the wound—all we can do is to look to the constitution of the patient, to see that it is not too much reduced, which sometimes appears to be the case, from the profuse discharge and the high irritation or suppurative fever ; it is useless to go probing and poking such a wound, for neither your instrument nor finger can reach it, the track of the ball is not straight, and even if you were satisfied

what the foreign body was, and where it lay, could you in many instances extract it? Should the opening close, matter may collect and form a considerable abscess; here the surgeon may render the greatest service by making an opening where the matter appears to point, or at least where a fluctuation is discernible, for it may be necessary to cut down very deep, and this to prevent the matter breaking through the old wound. In some cases where a foreign body lies long in a wound, and cannot be found or got at, there is one method you may practise with success, and, in fact, you have no other rational one to adopt—it is this, to plug up the external opening; by this means the matter is made to collect, this loosens the piece of cloth, or whatever else is there, and on letting out the well of matter, it will probably be floated out along with it; the best thing to plug it up is a little sponge dipped in a thick mucilage of gum-arabic.

Balls may remain in a man's body for years without doing the least harm; if you go to the Old Man's Hospital you will find many old soldiers there who will show you balls which you may feel in their flesh; they give no inconvenience whatever, except they are in the track of a large nerve, or are so situated as to interfere with motion. A man may be shot in the shoulder, and the ball may take five or six years travelling down the arm, and at length be felt at the wrist. Wherever a ball is lodged, it quickly becomes enclosed in a cup of coagulable lymph: this is very necessary for the surgeon to remember, for by forgetting this one fact, great difficulty is often experienced in operations for cutting out a ball, even by men who are quite well acquainted with the anatomy of the parts through which they cut. When you come down to the ball you expose about one-third of

it, and then it may be turned round and round, but cannot be extracted, except the cup of lymph is fairly and fully divided. Suppose a man is shot in a duel, and the ball can be felt—the patient and his friends are extremely anxious to have it extracted at once, for they suppose a man cannot be safe with a ball in his body; they are even so importunate that the surgeon must sometimes perform the operation on the field, to allay the anxiety of the patient: but it is bad practice, for you excite inflammation in the whole track of that incision, which of course is a bad addition to the first injury; you are forced to do it before the parts are ready for the healing process. It should not be attempted for at least seven or eight days, until the cup of lymph is formed round the ball, at which time it will, in general, heal readily. In gunshot, as in other wounds, there is often a good deal of inflammatory fever; it generally keeps pace with the state of the wound, and it must not be subdued *too much*; it has nothing peculiar in it, as it does not differ from other fevers of the sympathetic or inflammatory kind.

Gunshot wounds of joints, particularly large ones, as the knee, are very formidable injuries indeed. At first they are calculated to lull the inexperienced into a dangerous misapprehension as to the violent consequences that are to follow; the wound is small; swelling trifling; pain moderate, and the motions still easily executed; but after a little time the most violent inflammation shows itself, and the time may have passed for the surgeon to render effectual aid. This is a kind of injury likely to be followed by tetanus. We shall speak of wounds of the great cavities at another opportunity.

There is a set of symptoms attending gunshot and

other wounds, of which I have as yet said nothing—they are called *nervous*; for instance, a man gets a wound or a severe compound fracture, and on the second or third day, when you visit him, you find him with his eyes blood-shot, he in a high state of delirium, and remember this man was a stout healthy man previous to the accident; well, in this delirium he has his leg dangling perhaps by a bit of tendon, or a little muscle or skin; yet he feels no pain in his limb; he throws and tosses it about as if it did not belong to him; now, what are you to do here? You are to bleed him most largely; until he faints; bleed him instantly, and from such an opening as you would be almost afraid to make in a vein; if the vein you open does not bleed freely, open one in the other arm, and make him sit up; and then, when you find him getting weak, and a cold sweat coming out on his face, you bind up his arm, and most probably he falls into a sound sleep, from which he awakens quite calm and collected. But recollect you must make an impression the first bleeding. You desire an assistant to bleed him, and he tells you he has done pretty well, that he has taken fourteen or sixteen ounces from him; but twenty ounces at least must be taken, or no advantage will be gained. Now, there is another case which you must carefully distinguish from the former; in this case the wound or fracture, or whatever else it may be, has been suppurating for seven or eight days, when on visiting your patient in the morning, you see his eyes suffused; he has a peculiar cast of countenance; he is talking continually; his fingers have a tremor, and so has his tongue, if you bid him put it out. This is a nervous affection, and is peculiar to hard drinkers; nothing could be more injurious than to bleed *this* man—what are we to do? To give him opium—and you

must give it in tremendous doses—as large as sixty or seventy drops of tincture of opium every hour, and overpower him with as much as he wishes of whatever he has been accustomed to drink—if it is whiskey, give him whiskey—if porter, give him porter, and give it in as large quantity and as often as he wishes, until you get him asleep. When a patient in these circumstances gets a sleep, he generally recovers; but he may be several days and nights without closing his eyes. A patient was taken into Steevens' Hospital, and he got the first kind of delirium: he was every day getting worse, and we could not account for it; he had a wife who was very fond of him, and she begged hard to be allowed to sit up with him, and so she did—well, the man died, and when he was removed from the bed, two bottles that had contained whiskey were found concealed under the bed; he never had been a hard drinker, but in his delirium he called to his wife for whiskey, which she gave him as often as he called for it, and contrived to elude the vigilance of the nurse, who was a very proper and careful woman. The delirium of the drunkard does not often end badly; but remember you must make inquiries as to what particular intoxicating drink the patient was addicted to, and to administer only that kind during his delirium; for it is a remarkable fact that none other will have the same power as a remedial agent.

There is another very curious nervous affection arising from these injuries. A man, suppose, in going out of a room, pulls the door after him, and gets his finger jammed in between the door and the doorcase. In some days after he feels a kind of creeping sensation going from his finger up his arm, and so to his head, or, as others will say, to their heart; when it

arrives there, he is thrown into violent convulsions—these convulsions being of different kinds in different cases, sometimes like epilepsy. Now, it is said by some that these curious affections are owing to a tension of a fascia, but there is no tension in the case I have supposed, for such a case did actually come under my notice. Well—what are we to do here? First see if there is anything in the wound that could cause all this mischief; for sometimes a bit of gravel or a thorn may be the cause of all the disturbance, and which being removed the mischief ceases. I saw a woman who had an abscess in her thigh; it was opened, and the matter let out, but soon she got this affection—indeed the same evening. I came to see her, and on examining the wound, I found the lips glued together, but there seemed a fulness as if there was something which filled the space where the matter of the abscess had been. I gently separated the lips of the wound, and there I found a quantity of coagulated blood, which I removed, and she had no farther return of the convulsions. In these cases, if you find nothing suspicious about or in the wound, and if the patient be of a full habit, bleed him, and if that does not cure him, it, at least, prepares the way for the next best remedy—namely, opium, which you must give in large doses. It is not safe to give opium until evacuations have been premised.

Where you meet a case in which the patient has this sensation of a creeping up the arm, you will find there is nothing that will so speedily put an end to the affection as the application of a tourniquet on the limb. A woman fell in James's-street; she was a large, strong, masculine woman. In falling, her arm came to the ground, and she got a sprain; she was taken into Steevens' Hospital, where a relative of

her's was a nurse. One of the pupils saw her, but did not think much was the matter with her, and supposed she only feigned to be ill. I, however, saw her shortly after, and though there was nothing very serious in the appearance of the injury in her arm, I thought I saw something peculiar in her countenance, and desired her to be kept in till morning. Well, all that night her shrieks kept every one in the ward awake. The pain went from her thumb up her arm, and as soon as it got to her shoulder, she shrieked violently. It sometimes went from the shoulder down the trunk, and into the thigh of the same side. Every thing that could be thought of was done, but nothing was of the least service. Well, I recollected having read something about the tourniquet in such cases, and so I applied it to her arm, and immediately the next pain came, and advanced as usual, but when it came to the place which was encircled by the tourniquet, it could get no further. I then removed it, and placed it on the thigh, and when the pain came to that part, it was again stopped, and could not get beyond the instrument. I replaced it on the arm, and for several days there was no return of the pain. I then took it off entirely, (it was a little cruel, to be sure,) but I removed it, however, and quickly all the symptoms returned with the first violence. It was finally replaced on her arm; she had no return of the pain, and was completely cured by this method alone. A woman came up from the country with violent pains in her thighs; they were œdematous, and very much swollen; every remedy had been tried by her medical attendants in the country, but without avail. I was consulted, and I thought it a fair case for the tourniquet. It was applied, and when I went the next day, I heard that she had spent a tranquil night,

and slept well, the first night's sleep she had had for some time. Her friends thought me a very great doctor for so expeditiously curing what had so long resisted every one else; but in seven or eight days it lost its efficacy, and ultimately failed. The disease, I believe, was in the spinal marrow. The tourniquet, of course, was not kept always tightened on the limb, for it could not live in that state; but she was instructed to tighten it when she felt the pain coming on.

LECTURE V.

TETANUS—DISEASES WITH WHICH IT MAY BE CON-
FOUNDED—SYMPTOMS—TREATMENT.

Tetanus is another consequence of wounds, and one of much more formidable description than any we have yet spoken of. It has been classed into two kinds—idiopathic and traumatic—and this distinction at once shows that the affection may exist without any local injury whatever. We do not meet many of those idiopathic cases of tetanus in this country, but they do not appear to be at all of such rare occurrence in hot climates.

Systematic writers have placed Tetanus among the spasmodic diseases, but, in my opinion, improperly. The involuntary contraction of the muscles in all true spasmodic cases—in fact, in all cases but those of the disease under our present consideration, is but temporary—it may be for a minute or quarter of an hour, as in some cases of hysteria, but then comes a complete relaxation, leaving the muscles as if they had not been so affected; whereas in tetanus, the muscles never do relax—there is a more violent action of them at one time than at another, but during the continuance of the disease they are as hard as a board, from beginning to end—that is, say, for ten or twelve days. This being the characteristic symptom of tetanus, and one in which it differs from all others, we should take it out of the class of spasmodic diseases.

You can never say positively that any description

of wound will, or will not, be followed by tetanus. There are some injuries that will more frequently cause it than others, and among these may be mentioned, particularly, compound dislocation of the thumb, but I have seen it brought on by so trifling an injury as a mere abrasion of the cuticle over the eyebrow, by the stroke of a light horsewhip. I have seen it follow so apparently trifling a thing as a little gravel getting into a small wound caused by a fall on the knee, and which went no farther than the skin. A nail running into the sole of the foot, a luxation of the great toe, and some wounds received by the bursting of a gun, often cause it. Where there is much laceration of tendinous parts, there will be good reason to apprehend that tetanus will follow. In fact, there is no operation a surgeon performs, even the puncture of a lancet in venesection, that may not induce tetanus, and we are therefore bound to declare in such a case that the surgeon was wholly blameless, and that it was a consequence which no human foresight could see or avert. I do not think that any one particular period of life predisposes to tetanus more than another. As to the duration of the disease, it varies according to circumstances. If it sets in soon after the injury that caused it, it will run its course rapidly. Thus, suppose a man gets a hurt in the morning, and in the evening of the same day tetanus appears, he dies that night. Whenever it comes on so soon as this, the patient invariably dies in twenty-four hours; but you may not meet such a case as this in twenty years.

In these countries tetanus seldom makes its appearance before the sixth day after the injury; it sometimes will not show itself until the forty-second day. The wound may be in any possible state or stage—it

may be sloughing, or the slough may have separated, or more generally when the wound is suppurating, and as I have myself seen, even when the wound is quite healed. There is, then, no stage of the local injury in which tetanus may not make its appearance; and neither before, nor during the progress of the complaint, does the wound alter its character in the least, as it does in hydrophobia.

There is a form of tetanus where the muscles of the jaw alone are affected, and this is called Trismus, by way of distinction. It is often merely a symptom of some local irritation of a temporary nature, and goes off with the subsidence of its cause.

There are two states or conditions of tetanus enumerated by authors—one, *Emprosthotonos*, where, during a paroxysm, the body is forcibly bent forwards, and *Opisthotonos*, where the body is bent backwards. Now, I never saw a case where the first condition existed perfectly. I remember the case of an old man under tetanus who preferred sitting up in bed, but even in this case the body was not more drawn forwards during a paroxysm than at other times.

The symptoms of tetanus are essentially the same in all parts of the world, but in low latitudes they are much more rapid and severe than in temperate climates. The patient at first yawns frequently, and, it is said, sleeps with his inferior extremities strongly extended, but of this I am not certain. He next complains of a slight soreness in his throat, with some little difficulty of swallowing; but if his throat be examined at this period, nothing particular can be observed in it. Even at this early period there will be observed a peculiar cast of countenance that marks distinctly the commencement of the disease. He next feels a

stiffness about the back of his neck, or, as he may call it, a "crick in his neck," which prevents him turning his head about; yet if you feel the parts externally, you are not conscious of any rigidity of the muscles of the neck. He finds he cannot open his mouth wide, and this is the first thing that generally alarms the patient himself. In this state he may remain for a few hours, or even a day, with little more advance than the increased rigidity or locking of the jaw. The difficulty of swallowing is now very much increased; he begins to feel a pain going from the xiphoid cartilage to the back. The muscles of the abdomen become rigid, so much so as to destroy the natural convexity of that region—to make it flat or even concave, and as hard as a board. The tetanic countenance has in the mean time become perfectly marked, although it is still more striking during each paroxysm. It is very peculiar, and if once looked at with attention, can never be forgotten. The forehead is wrinkled, both transversely and in the perpendicular direction, the eyebrows being drawn in a remarkable manner towards each other; the eyes are not fully opened; the nostrils more or less dilated; and the angles of the mouth drawn backwards and a little upwards. There is generally an expression of uneasiness, and slightly of apprehension; the mouth is not quite closed, and the teeth are seen; the body is sometimes hot and dry, but oftener the upper part is covered by perspiration, at times profuse.

The spasms from the first are very easily brought on, as by speaking, turning in bed, or attempting to drink, but as the disease advances they occur without exertion or other apparent cause of any kind. In the early stage, although the countenance seems to express otherwise, if you ask the patient he will

not complain of much inconvenience, but he is afraid to drink, as he cannot do so without bringing on the spasm. In some cases the spasms are excessively violent; I have seen the body curved backwards, so as that the heels have touched the back of the head, and with the force of the jerk, the patient been thrown out of the bed on the floor. The first parts that are felt rigid are, the masseter muscles, those about the fauces, and those of the back of the neck, and from these the hardness descends to those of the trunk, abdomen, and lower extremities. It is a curious fact that the muscles of the fingers are generally the last and least affected of all others. During the paroxysm the breathing becomes laborious, short, and hurried, so much so that you would think the patient every moment in danger of being suffocated; the pulse gets rapid, and the face is bathed in a cold sweat; in about a minute the spasms cease (although, as I said before, the muscles always continue in a state of spastic rigidity); the pulse becomes regular; the breathing continues hurried; the sweating continues; the patient makes efforts to get up a thick mucus which is in the trachea, which he ejects from between his teeth with much exertion and force. If you ask him where he feels pain, he will point it out as extending from the pit of the stomach backwards towards the spine, seemingly following the course of the diaphragm, and this symptom is always present. His appetite is generally pretty good, but he dreads swallowing anything; his bowels are usually confined, and the urine scanty, and sometimes passed with difficulty. It is a very remarkable thing in this disease that the patient never complains of pain, except you question him, and then he will tell you his sufferings are dreadful. He seldom appears to suffer from

thirst; his appetite is generally good, but he dreads taking any nourishment, as the effort to swallow anything brings on the paroxysm; he enjoys sleep, but is awoke out of it by a paroxysm. Spasm of the muscles thrusts the tongue out between the teeth, and it is often lacerated by contraction of those of the jaw. The ordinary duration of tetanus, when it is to end fatally, is three, four, or six days; but I have known a patient to die of it so late as the twenty-first day. The idiopathic cases are in general slower than the traumatic; in the latter the symptoms are most rapid from the second to about the sixth or seventh day. The patient dies apparently by strangulation during a paroxysm.

There is no disease which has been so often confounded with others as tetanus, although the symptoms are so well marked. For my own part, I think the countenance would, in every case, be sufficient to distinguish it from all others. I never saw but one description of face, one tetanic expression of countenance; it is the same in all cases; it is the first thing that gives the alarm, and the last symptom to depart. Even where a patient recovers, and is able to go about his business, that tetanic face remains—I believe it never leaves him. There are other diseases in which there may be some resemblance to a *paroxysm* of tetanus, but none in which the muscles remain, as in this, as rigid as a board after the paroxysm. In tetanus, each paroxysm is *one continued* spasm—it may last for a minute, but it is but *one* spasm, while in hysteria, for instance, it consists of a succession of alternating spasms and remissions, and this one circumstance can leave no doubt of the disease. There is a case which sometimes occurs, where the patient lies rigid and absolutely stiff and immoveable, and he re-

mains in this situation perhaps for three hours; in one instance I saw of the kind, the patient remained in this state for nearly a day, and, on being the least moved, convulsions came on, but there was neither the tetanic countenance nor the same rigidity of muscles. Now, this is nothing more than ordinary hysteria. The pain shooting from the xiphoid cartilage to the spine along the diaphragm, and the spitting up of a thick mucus, are common to hydrophobia as well as to tetanus. I was called on once by the attending physician to see what I was told was a case of tetanus; but when we arrived we found the patient walking about the room, and the doctor and the patient's friends regretted very much that unfortunately I did not arrive during a paroxysm! Of course this could not have been a case of tetanus at all. Sometimes it will happen that a patient recovers from tetanus, at least as far as the flexibility of the muscles is concerned, and he is able to go about, but it is a remarkable fact that those persons often die of affections of their chest. In one case I saw, that of a young man, whose arm had been dreadfully shattered by the machinery of a mill, and who appeared to have perfectly recovered from the tetanus, there came on a cough soon after, and at each cough he threw up about half a pint of fluid resembling exactly in colour the wine that is returned from the bag of a hydrocele which had been injected for the radical cure, and he continued to cough up this for three days, and then died. In another that I saw who had recovered from tetanus, the pulmonary symptoms were those of ordinary phthisis. In some cases you will read of, called tetanus, you are told that the patient's screams could be heard three streets off. Now, I ask any one who ever saw a tetanic patient, if he ever heard a cry from such a

patient that could be heard outside the door of the room he was in ? I know *I* never did. In other cases we read of, we are told that the patient took five bottles of Madeira a day, and three ounces of bark. Now, *we* can hardly get a tetanic patient to drink the smallest quantity of any kind of fluid, or to take three ounces of bark through the whole of a protracted case. The same kind of authority tells us that a change is observed in the wound ; that the suppuration diminishes, &c. I have paid particular attention to this matter, and never observed any alteration in or about the wound on the coming on of tetanus, except in one instance ; this was a girl who had necrosis of the tibia ; she was getting up behind a carriage, and a spike ran up into her foot ; she got tetanus, and there certainly seemed less of inflammation and suppuration than might in such a case have been expected. I am convinced there is no connection of this kind between the wound and the disease ; but those who are of a contrary opinion, place their chief reliance on the *local* treatment, and this is to stimulate it as much and as violently as possible. Well, I have tried this plan, and after exhausting the ordinary stimulants, I invented one for myself, consisting of muriate of antimony, saturated with corrosive sublimate, but I only added considerably to the patient's torture, without doing a particle of good. Cutting off the wounded part has been recommended by Larrey. I was present when Mr. Obrey amputated a limb where compound luxation of the thumb had caused tetanus, but he might just as well have left it on. I myself have lately put it to the test in Steevens' Hospital, in the case of a man whose arm had been greatly lacerated, but he died in the ordinary period, as if nothing had been done—it made matters neither better nor worse.

Well, then, as we have no chance of preventing or curing tetanus by any treatment of the wound, we must turn our attention to the constitutional remedies, and what are they? A good deal has been written on the efficacy of opium—with what justice I will not pretend to say. In one case under my own care, which got well, I had ordered two grains of opium every three hours, and when I saw the patient getting better, I thought the opium was doing wonders, but after ten or twelve days I found, on looking at the pills, that they were no larger than the heads of pins—an apothecary's boy who made them up considered a *grain* to mean the smallest possible quantity, and accordingly made them so small that they could have no effect of any kind. If you give opium, the tincture is the best form, as the patient can better swallow it; you must begin with forty or fifty drops every two or three hours, and increase the quantity according to the severity of the symptoms, so that in time the dose may be doubled. Even in very large doses opium will not cause drowsiness in a tetanic patient, in one case out of five; where it *does* cause it, it is a favourable sign, and you may then increase the dose; but you may give *too much* opium in this as in other cases, and therefore when you see the patient's eyes turgid, as if inflamed, when the face, which was before pale, becomes red and bloated, and its vessels turgid, like an attack of apoplexy, you must lessen the dose immediately: if you persist you will kill your patient as certainly with your remedy, as the tetanus would have done. Some say that the bowels become very torpid in this disease—I never saw this, but it may be true, however, and therefore you will look after them, and not suffer them to become too costive, and the best way decidedly to give purgatives in tetanus is in the

form of glysters. I recollect when Dr. Hamilton's book came out, it was expected that every disease could be cured by purgatives, and of course they were tried in tetanus; but I always found patients die sooner under this treatment than when nothing of the kind was tried. Musk has been advised; it is, however, too expensive a remedy for hospital use, so I can't speak of it from experience; but from what I have heard of it, I should not be inclined to place much reliance on it. The next best thing to opium is mercury, and the best way to exhibit it is by friction along the spine and elsewhere, in large doses, so as to cause salivation as quickly as possible, for there is not much time to be lost; you should throw it in, so as, if possible, to affect the mouth in twenty-four hours. Two drachms of mercurial ointment should be rubbed in at once along the spine, the limbs, jaws, throat; in fact, every where you can, to accelerate its absorption; every inconvenience must be risked if the medicine is to get a fair trial, and this it may get, especially if the case is not a rapid one. Some caution is, however, necessary: you know a patient could be killed by throwing in mercury too quickly. I do not know whether given in tetanus it causes that affection of the heart which it does in other cases, when given incautiously, but I would be on my guard, however. It is difficult to salivate tetanic patients, and we are told that if we succeed in doing so, they will recover; but I have seen patients die of tetanus while under profuse salivation; it has been found more serviceable in the idiopathic than the traumatic species. Warm baths are advised: now, what are their effects here? Just this—the patient may get a paroxysm while being put into it; but the first time he gets into the bath, he feels very comfortable, and wishes to remain in it—

the second time he is anxious to get into it, but he does not express so much satisfaction in it as he did the first time; he does not feel quite so comfortable, and you will rarely be able to induce him to try it a third time; the object sought for by the warm bath is to make him sweat. Dr. Wright advises the very opposite to this—namely, the cold bath, or cold water dashed on the patient suddenly, as an infallible cure, but when you come to his cases you find it was not tetanus he was treating at all; for he mentions, among others, one case where the paroxysm lasted ten minutes; but in locked-jaw a paroxysm never lasted half that time. I doubt if the doctor ever cured a case by the cold bath; and though he speaks of the disease as it is met in a warm climate, I doubt his statements, for Dr. Chalmers, a man who certainly wrote from observation, describes the disease in South Carolina exactly as it appears in these countries, and I am convinced there is no difference in its symptoms anywhere. I have heard of patients being cured instantly by the first glass of whiskey on Dr. Rush's stimulant plan, but this was not tetanus, for it was never cured *suddenly* by any treatment ever employed; but cases of hysteria, bearing some resemblance to tetanus, often are; whenever it has been cured, the improvement has been so very gradual, as to be a character of the disease.* A tetanic patient never

* I had read in some non-medical work the manner in which the inhabitants of the Tonga Islands cure locked-jaw, to which they are particularly subject from the difficulty of extracting the barbed arrows they employ in battle. They introduce a painted piece of reed into the urethra for three or four inches, and then push the pointed end through its inferior wall and integuments, and leave it there until it causes great inflammation and pain, at which

feels any sensation in the wound that could give him the slightest idea that his sufferings were owing to it.

When cases of common tetanus are to become fatal, we do not find the paroxysms grow less frequent, but they become apparently milder, and, on the contrary, when the patient is recovering, the intervals between the paroxysms are lengthened, but the violence of the last paroxysm that man may have may be as great as that of any of the preceding ones. Sometimes on visiting a patient he tells you he is better—he is now able to put two fingers between his teeth, whereas a little while ago he was only able to put one; he *feels* himself better—his jaw can be opened more, and his limbs are more flexible—his friends meet you with a smiling countenance, and everything is congratulation—now, what are you to expect? Why, that the next paroxysm the patient gets, will carry him off—the very next paroxysm will certainly be the fatal one. You had better, in the progress of your treatment of a tetanic patient, keep a bit of wood, or cork, which I think better, rolled in a small piece of linen between his teeth, to allow food and medicine to be introduced when necessary; you

time the rigidity of the muscles passes off, and the person most generally gets well. The late Mr. Wallace had a case in hospital when I was a pupil. I mentioned the savages' cure to him, and he resolved to try it in a modified form. He introduced a bougie smeared with strong red precipitate ointment into the urethra, and as soon as the patient began to suffer pain, the muscles of the limbs grew soft beyond a doubt. The same evening I introduced it myself, the same effect followed, and the man had not another paroxysm for an hour and a quarter, although they had been coming on about every twenty minutes previously. The patient, however, absolutely refused to allow a third application.—*Ed. of Lect.*

need not fasten it with strings or anything else. It is said that the body of a tetanic patient runs into decomposition sooner than any other; I cannot say how true or false this may be. Tetanus may end fatally before every part of the body gets rigid, and patients do very often die before the upper or lower extremities, or both of them, have become so.

When you come to examine a tetanic patient after death, nothing can be seen that could be called a *cause* of what he had undergone, but some of the *effects* may be detected. You may find some of the muscles of the limbs, but more frequently the recti muscles of the abdomen, torn across, and an effusion of blood in some places; the muscles are torn by the force of their antagonists during a paroxysm. Some stress is laid by writers on the effusion of blood or serum found in the brain in these cases, but there is nothing peculiar in this occurrence—it is common to all convulsive diseases; nor is much weight to be attached to blood being found in the spinal canal, as it may be caused by the very act of opening that canal for the purpose of examination. It is a curious fact, that when a case appears in this city, two or three cases will occur at the same time; sometimes there will be two in one hospital, or several will occur in one year, and then we shall hear no more of it for a length of time; the time I have seen most cases occur at once was in a very warm and moist summer.

How should we treat a wound likely to cause tetanus? I believe the very best thing is turpentine dressing—there is certainly something peculiar in the action of turpentine, and in the inflammation it causes, that is salutary, in unhealthy wounds. Of internal remedies, the one on which, from my own observation, I place most reliance, is the employment

of sudorifics. I had a case of a man who, in ringing a horse, got a severe hurt in his loins by some awkward check; slight symptoms of tetanus followed, and by getting him into a profuse perspiration, which I kept up for a few days, the symptoms went off. I then left off the medicines, and they returned; on resuming the treatment, they again disappeared, and the man was finally cured. I saw another similar case in a gentleman, who was cured by sweating. Some cases have occurred in this city said to have been cured by Tobacco. I have not had myself, however, experience in this method sufficient to enable me to speak decidedly of its utility, but it is certainly one that merits attention.* Idiopathic tetanus is slower in its progress, and more likely to get well than the traumatic; it is more prevalent in tropical countries than with us, and is characterised by its being ushered in with fever; the pulse is mostly much quicker in the idiopathic than in the traumatic kind. In every case I saw cured of it mercury was employed, but I cannot say that the cure was performed by the mercury.

There is a variety of the disease before us called

* The importance of the subject obliges me to state, that I saw two of the cases alluded to above, while I was a pupil in Jervis-street Hospital. They were the patients of Dr. O'Beirne, and one of them at least was seen by many of the first surgeons in Dublin. The treatment was simply an enema of an infusion of tobacco, thrown up two or more times each day, according to the effect produced on the system, and both recovered. I saw with Dr. Davis a third case of tetanus in Summer-Hill, about the same time, which was similarly treated, and which also recovered. It is to be regretted that Dr. O'Beirne has not published the result of his experience of tobacco as a remedy for this formidable disease. I have lately learned from him that he has had some other successful cases.—*Ed of Lect.*

Trismus Nascentium, or nine-day fits, and which is seldom observed except in the lying-in hospitals; the nurses that are accustomed to witness it will tell by the very cry of the infant that it is getting, or has gotten, nine-day fits; when it carries off the infant in five or six hours, it is called by them the "Black Fit," and when in five or six days, the "White Fit." I have examined several that died of this, and have always found that the navel string, whether it had separated or not, had left an ugly foul ulcer behind it. In the West Indies, when the preservation of the slave infants became of great importance in the eyes of the owners, greater care was taken of the mother during her lying-in than there used to be; formerly, she was let to remain in the wet and cold, but latterly, everything was kept dry and neat about her, and the navel string was constantly dressed with turpentine. The prevalence of trismus nascentium diminished in proportion to those improvements in the condition of the mother and child. I have no doubt that trismus nascentium generally, or frequently at least, depends on the condition of the navel string I mentioned, and the best thing to do is to dress the ulcer with turpentine, and to exhibit mercury by the mouth. I treated one of these cases with strong purgatives on Dr. Hamilton's plan, and it ran its course very rapidly. In fact, it is generally fatal. It is a remarkable fact, that trismus nascentium is rarely met with in the country, and scarcely ever in private practice even in cities.*

* There is a very interesting paper on this disease by Dr. Clarke, in the third volume of the *Transactions of the Royal Irish Academy*.—*Ed. of Lect.*

LECTURE VI.

HYDROPHOBIA—SYMPTOMS IN DOG—SYMPTOMS IN MAN—
TREATMENT. ULCERS—SIMPLE PURULENT—FUNGOUS
—CALLOUS.

THE next subject we shall consider is a still more intractable disease than tetanus; it is called *Hydrophobia*, from what is usually thought to be its characteristic symptom. It is a singular consequence of a particular poison received into a wound, in at least the great majority of cases, although there is reason to believe it may get into the system in some instances without the occurrence of any wound, or even abrasion of the cuticle. We are not without book evidence to prove that this disease can *originate* in man; but read the cases attentively, and you may convince yourself that they were not really what they were thought to be; for instance, the dread of swallowing liquids, so much relied on in these cases, is not peculiar to hydrophobia; it exists in many other diseases just before death. I have said this disease may come on without any wound: as an instance of this, I saw a young girl, who, while standing at a hall door, had her apron torn by a mad dog that made a snap at it in passing. She got a needle and thread and sewed up the rent, and not having a pair of scissors by her, she cut off the thread with her teeth, and she got hydrophobia and died of it. The disease arises naturally in many animals, as the dog, wolf, jackal, cat, &c. It is certain that a rabid cat will communicate

it sooner than a rabid dog; some animals, as the horse, cannot communicate it to man or animals.

When a dog has hydrophobia, you recognise it by these symptoms:—He appears sick, dull, and peevish, but this lasts only for a short time, and he again becomes playful; in a short time he seems to forget his master, but still he stays at home. By-and-by he quits home, and roams about the country; his run is weak, and he goes in a zigzag manner, with his back very convex, and his tail drooping. His nose is observed in this stage to get dry, and as yet he is not afraid of water, but will run or swim through water if it comes in his way; in his progress he avoids other dogs, and what is very remarkable, all the dogs he meets will avoid *him*; although he sometimes bites a good many of them, when he comes upon them suddenly or unawares; he does not go out of his way to bite, but he will snap at anything in his way; after running a long distance, he often returns home again. Now, a mad dog does not foam at the mouth, as is generally supposed, and his madness can never be known by this circumstance. To the last he may drink—I have seen a mad dog finish a bowl of bread and milk a few hours before he died. As dogs, and particularly young ones, are subject to a great many diseases, some of which may resemble hydrophobia closely in particular stages, and as it will be of the greatest importance to know the truth; should any suspicious symptoms show themselves, we should keep the dog confined, until he either dies or recovers, as the best mode of ascertaining whether he was mad or not.

When a person is bitten it is impossible to determine from the size, form, or other characters of the wound what may follow—they give us no insight into the future consequences.

Every one that is bitten by a dog really mad does not get the disease ; the proportion of those bitten is as fifteen to one that gets hydrophobia, so that we may reasonably doubt the efficacy of many of those remedies we hear of to *prevent* the disease. The symptoms of hydrophobia never appear earlier in a man than the twentieth day after the bite ; the most usual period is between the thirtieth and sixtieth days ; sometimes they do not appear for twelve or even eighteen months. We have accounts of cases where there was a lapse of twenty years between the bite and the appearance of the disease, but they are not to be relied on. After eighteen months have elapsed you may consider your patient safe—there is no fear of his getting affected. The wound given by a rabid animal heals with great readiness, although the patient may afterwards get hydrophobia. When the symptoms set in, and the disease is about to show itself, the cicatrix of the wound shows a disposition to inflame, and there is generally a kind of creeping sensation running from it up the limb, and so to the trunk ; but this is not always so, for in a case lately in the Meath Hospital nothing uncommon appeared about the cicatrix. The first symptoms manifested by the patient are—he passes restless nights, disturbed by troublesome dreams ; he becomes melancholy, and fond of solitude ; there is a peculiar lassitude about his look and manner ; as it proceeds, the senses become morbidly acute ; he becomes irritable ; the pupil is dilated, and the eye perhaps gets a shining appearance, but of this last I am not quite sure ; his countenance exhibits a mixture of coldness and timidity ; it betrays suspicion often of those about him, and his eye follows their movements about the room ; he feels a tightness or squeezing about the precordia.

At length, he becomes affected with spasms, and gets a horror of drinking; if you ask him, he cannot tell you why he does not like to drink—he really does not know. This horror of fluids does not always exist. In a case I saw a few days ago the patient drank two or three spoonfuls without much effort. Now, this does not at all depend on the will or determination of the patient, for those with the firmest mind and the strongest resolution will get the cup of fluid near to their mouth, and will even grasp it firmly with both hands, yet when it touches their lips they will suddenly, and as it were, involuntarily, dash it from them to some distance, apparently in the greatest fright, while others of a quite different character will swallow a little without much reluctance. You see, therefore, that the popular notion of the horror of water forming the great diagnostic of hydrophobia, is incorrect; we have the same horror of drinking in some cases of hysteria, in some affections of the brain, in tetanus, &c., while in some cases of hydrophobia, they drink with little reluctance or difficulty.

The senses, I mentioned, become very acute—the patient in general dislikes a current of cool air very much, but I have seen an exception to this, one in which he seemed rather to desire it; sometimes even the sight of a polished surface, or the sound of water pouring from one vessel into another gives him great uneasiness; he will start on the slightest unexpected touch, or at a sudden noise. After continuing in this state some little time, he at length gets into violent convulsions of the whole body, which have their exacerbations and remissions, very unlike the spasms of tetanus, which never undergo a complete remission from beginning to end; the strong effort to eject or get up viscid saliva produces that noise which

people conceive to be barking. While in the convulsions it is that bye-standers think he is making efforts to bite those about him, but this is not at all the case; he really has no such intention; you might just as well suppose, as he throws his arms about, that he is endeavouring to strike those near him. From this mistake, however, as to his intentions, it was formerly the custom to put the patient, in this stage, between two beds and smother him, from the apprehension of his biting any one: there is no excuse for such a practice now; and indeed I very much doubt if they even did bite, that there would be any case found on record to warrant us in fearing the disease would be transmitted in this way to another person.* The paroxysms in the disease last longer than those in tetanus: the patient has the same pain shooting from the xiphoid cartilage towards the spine, and the same viscid mucus in the trachea that we observe in tetanus; unlike tetanus, when the spasms in hydrophobia cease, there is a perfect relaxation of the muscles; the patient looks mild and timid, his eyeballs are often suffused, and you not unfrequently find him walking about the room, and would not think from his appearance that anything particular was the matter with him until you see him get into convulsions; he mutters to himself, but you cannot tell what he is muttering, nor can you get him to tell you—he seems to have a dislike to tell, but if you speak to him it rouses him out of this, and he speaks rationally. The pulse is extremely variable; it is of course quickened during the paroxysm—at length, he dies quite calm and apparently exhausted. There is but one thing in

* See experiments of Magendie and Breschet on this point.—*Ed. of Lect.*

our power to prevent this disease, and that is excision of the bitten part, and it must be cut out completely ; but this, from the situation and other circumstances of the wound, is sometimes difficult—but no matter, it must be done—as, suppose, the hand is bitten quite through, and here it will be a terrible operation. How soon after the bite may the operation succeed ? Why, I have known it succeed in seven or eight days after the bite. I remember three stable boys at Howth who were bitten by the same dog at the same time ; two of them suffered the part to be cut out, and they escaped, the third would not submit to the operation, and he got hydrophobia and died. There is another case recorded where the part was cut out seventy-two days after the bite, and the patient recovered, but we cannot be certain that he would have had the disease at all if nothing had been done for him. It has been recommended to have the wound sucked, but this can be of very little, or indeed no use to the person bitten, and, as we have seen, the person who sucked the wound would very much endanger his own safety. The next thing advised is the application of caustic to the wound : if used it must be of the very strongest kind—something that kills the part at once, without requiring to be rubbed for a long time, as some of the milder kinds do : use the pure alkali, or sulphuric acid, or, what I think by far better than either, butter of antimony. No constitutional treatment can be relied on. Bleeding is of no manner of use ; at the first bleeding the patient is probably relieved, but the second always makes him worse, or at least he always gets worse after the second bleeding. It has been advised to make the patient run about in this disease, and this advice had its origin in a case in St. Thomas's Hospital, where the hydrophobic patient escaped, and

ran through several streets before he was stopped, and he was thought to be much better after it, but his improvement was only temporary. There are sufficient grounds for the belief that an animal, not himself affected with hydrophobia, can nevertheless give it to others by biting them. The elder Mr. Dease used to mention a circumstance, when I first heard him lecture, of an ostler who was playing with his dog—he used to hold out his arm for the dog to leap up to it, and when he did so he used to shake him off again: the dog, however, got vexed, and bit the man's arm, and the consequence was, the man got hydrophobia, although the dog was not mad, nor did he ever get mad, for he was tied up to ascertain the fact. In the country sea-bathing has been practised with cattle that have been bitten by a mad dog; they are brought once or twice a day to the sea side, and are made to walk through it for some time, and apparently with considerable advantage. I think it bids fairer than most general measures to do service in the human subject, yet it has been tried, and persevered in for six weeks, but the disease supervened, as if nothing had been done. During its employment every effort should be made to tranquillize the patient's mind by giving him confidence in its success. Mercury pushed to salivation has failed repeatedly; arsenic, and in fact every other thing tried for a cure after symptoms had set in, have been totally useless, and there is obviously little reliance to be placed on any of them as preventives.

The notion that dogs only get mad in the heat of summer is not correct; they are quite as liable to it at any other season as in the dog days. I am informed that spring is the time dogs are most subject to this disease in Scotland, and it is accounted for in this

way. A number of cattle are annually left to perish during the severity of the winter, and it is supposed the dogs over-eat themselves which causes a tendency to the disease; but whether this be correct or not, I cannot say. There are some places which appear entirely exempt from the occurrence of hydrophobia, as the leeward West India Islands, and other places. In Antigua there has not been a case of it known for fifty years, and this does not depend upon the latitude of the country. Other animals besides dogs and cats can communicate hydrophobia—for instance, the racoon; the late Duke of Richmond died of the disease from the bite of a rabid fox. In Paris a remedy has been proposed for the cure of hydrophobia—viz., injecting medicines by the veins; but their injection will be found as dangerous as the disease itself—they will kill as certainly, though in a different manner. I consider any injection into the veins, except of blood, mortal.

ULCERS.

WHEN a wound does not heal by the first intention, and when granulations arise in it, it is called a *Simple Purulent Ulcer*. An ulcer may exist in any structure, and on any part of the body; but some tissues are more frequently its seat than others, or have seemingly a predisposition to ulcerate; so also have some diseases a tendency to produce, or end in ulceration. Ulcers are met with under a variety of forms; and I can assure you there are few things you will see in your hospital more worthy of your particular attention than the discrimination of one kind of ulcer from another, or becoming familiar with so much of their

more characteristic features as may guide you to their proper treatment. An ulcer is a secreting and absorbing surface; it forms pus either of the simple kind, or of a specific quality, capable of producing a similar disease in another person, or of some peculiar morbid character not of an infectious nature. It will absorb readily—for instance, if you treat an ulcer with red precipitate, you may salivate the man; if it is such a sore as you would deem proper for arsenical preparations, and that they are not applied with sufficient caution, you may poison him. A simple ulcer in a healthy person is attended with scarcely any pain; its surface is covered with small, reddish *granulations*, and it discharges a moderate quantity of mild unirritating pus, of a creamy colour and consistence, and without any offensive smell about it. The manner in which such an ulcer heals is this: there appears a pearly appearance about the margin, and you soon perceive that this is a new cuticle which is covering it; this appearance gradually proceeds inwards towards the centre of the ulcer until the whole is covered over. But this is not all—after it has been healed some time, you observe that the cicatrix that is left is not at all so large as the ulcer had been; there has been therefore a *contraction* of the circumference of the ulcer likewise, which materially assists the healing; no matter what the form of the wound, or of the ulcer that results from it, it contracts in every direction, and will be found diminished as much as two-thirds of its entire circumference in three weeks. If this simple ulcer be let alone, it will heal of itself; our object in the treatment of it is to exclude the air from it, and for this we employ ointments, which, from their greasy nature, perfectly answer this intention; if the ulcer

be left to itself, nature will effect the same purpose, by forming a crust over it by the drying of the discharge. Now, we may assist another of the means nature employs to heal this ulcer—that is, the contraction of its granulations; and this we do by applying strips of sticking-plaster in the manner recommended by Baynton, which draw together the edges towards each other, and keep them so. But suppose the ulcer is on the leg, as encircling the limb thus would constrict it partially, we prevent the ill effects of such a partial constriction by putting a roller on the whole limb, beginning at the points of the toes, and carrying it in a spiral manner, and as even as possible, up to the knee. Simple ulcers may be caused in a great variety of ways: thus the surface of an Anthrax, after its slough has been discharged, will become a healthy-looking, simple, purulent ulcer. A venereal chancre does not always heal under the influence of mercury, even when the cure of the disease is perfected, but may quite change its former characters, become this simple ulcer, and heal under the simple treatment of such an ulcer arising from any other cause. Ulcers of any kind on the extremities will be retarded, or entirely prevented from healing, if the limb be œdematous. You will therefore attend to this complication, and treat it with frictions, rollers, and a horizontal position, simultaneously with your local treatment of the ulcer itself.

The simple ulcer, in any stage of its progress, may change its character, and become what is called a *Fungous Ulcer*, by which is meant, when the granulations have become large, pale, and obtuse, and rising above the level of the surrounding skin. The change is caused by some local or general debility, is unaccom-

panied by pain, and, not unfrequently, is owing to the unnecessary use of relaxing poultices and stupes to the healthy ulcer which preceded it. It is, however, the simplest vitiation from the simple ulcer, and is easily cured. The granulations are to be touched with lunar caustic, sulphate of copper, or some other mild escharotic—not with the view, mind you, of *eating down* the granulations, but by the stimulus it gives to their absorption. Gentle pressure, on Home's plan, should afterwards be kept on the ulcer, to keep down the granulations. If strong caustics be employed to destroy those fungous granulations, they will readily slough away, but nothing is gained, for they will spring up again, perhaps larger and more troublesome than before. While an ulcer is in this state it shows no disposition to heal.

A *Callous Ulcer* is one the edges of which are not raw, but are covered with cuticle: the surface of which is too smooth, and the discharge from which is thin, and unlike pus; its edges are raised above the surface; the whole ulcer is extremely indolent and insensible, and the patient, in cleaning it, uses it very roughly, without seeming to feel more than if he was rubbing a piece of sound skin. By applying red precipitate to the edges, they will be soon lowered, and granulations will then spring up in three or four days. So long as those high callous edges remain, the ulcer will not show any tendency to heal.* There is no ulcer requires Mr. Baynton's plan of treatment so much as the callous ulcer. His mode of proceeding is this:—He gets some strips of good sticking plaster,

* I have found the scalpel, in every respect, better than escharotics or caustics for removing those callous edges.—*Ed. of Lect.*

about an inch wide, and, applying the middle of one of them to the leg on the opposite side to the sore, he brings them forward, drawing the edges of the ulcer towards each other, and crosses the two ends of the plaster over its surface firmly and evenly. You will find it necessary to have an assistant to draw the edges to one another with his fingers, while you apply the adhesive plaster. In this way you apply successive strips, until the entire sore is covered over with them. When you apply the strips of adhesive plaster on it, it must be with sufficient firmness to give pain : but this will generally go off in half an hour, and in three or four days the edges will be gone. The straps may be left on for three, four, or even eight days, and if, before applying them, you cut a few holes in them, the discharge will be allowed to escape, and you can wash the ulcer by letting a stream of water play on these holes ; you, of course, remedy any œdema in the limb by rollers and rest. Baynton's plan will not answer with ulcers over a bone and adherent to it, as on the shin : you may, to be sure, draw the edges together until you make them overhang the ulcer ; but you do not, by these means, diminish the *surface* of the ulcer in the least. In these cases you must use stimulating dressings, but not as it is usually done in the hospitals ; for legs that have been constantly exposed to the weather, or perhaps daily immersed in bogs, will bear much more than the delicate ones you will meet in private practice. In every case where you sprinkle an ulcer with red precipitate, you must put pledgets of dry lint over it to absorb the discharge, or the precipitate will be carried out with it, and excoriate the neighbouring skin, and cause three or four ulcers instead of one ; the pressure of these pledgets will

also assist the healing of the ulcer. It has been recommended to change the stimulating dressing, as soon as you have brought a callous or vitiated ulcer to the simple state, for those of the absorbing kind. This may sometimes be necessary, but very seldom so, for the continuance of the stimulating dressing will heal the simple ulcer; however if you do make this change, you are to cut narrow slips of simple dressing, and lay them on the edges of the ulcer where they are inclined to heal, and then apply *lapis calaminaris*, (impure carbonate of zinc) or any other absorbent powder on the centre. The stimulant dressings, as well as the absorbent, should only be applied to the hollow of the ulcer.

There is another variety of ulcer met with, the surface of which is of a greenish colour, and the discharge from which is of a greenish hue—this is the *Irritable Ulcer*. This is sometimes a very perplexing kind of sore; and here I would recommend you to read Underwood's book on Ulcers of the Legs: it is excellent on this and the Callous Ulcer. Nothing, positively, is so interesting in all surgery to a junior pupil as the treatment of ulcers. He should dress them with the greatest attention, and observe every appearance and change with care, until he becomes so familiar with them, that he can predict, with certainty, on looking on an ulcer, what will happen in its progress. If your patient is walking about with an irritable ulcer, you may try the soothing plan with it; but the soothing treatment will not answer always. I have seen some where a mild poultice almost set the patient mad with pain. I at first thought that it might be owing to the kind of poultice used, and have, in consequence, changed them repeatedly, but found that whatever poultice was put on produced the same

effect, which convinces me that it is not the composition of the poultice, but something in the nature of the ulcer which did not admit of the soothing treatment. I think the term Irritable Ulcer a very vague one, for any ulcer may become irritable, and with almost any appearance. There is only one description of ulcer I ever met with, that really deserves the name, and which is not described in books ; it is this—It generally comes on the outer side of the ankle, upon or a little above the external malleolus ; it is a small ulcer, sometimes not larger than the point of the finger ; it never goes entirely through the skin ; it has no edges, nor is there any inflammation about it ; it discharges good matter, and has nothing very grave looking connected with it ; it is excessively painful, however, and you examine it all over in vain, to say why it is so. You really can see nothing to account for it, in its appearance at least. Now, if you have soft, mild applications, such as poultices laid on it, you will set your patient mad with the pain. You must treat it in directly the reverse way. Rub over its surface with a pipe of lunar caustic, and dress it with a solution of the same under which the pain will go, and the ulcer heal.

We sometimes meet with an ulcer, the edges of which considerably overhang the surface. You think, on looking at it, that you see the extent of it, but on introducing a probe under these edges, you find that the ulcer extends a good way under it. This is an extremely tedious kind of ulcer, and will keep a patient longer in an hospital than any other I know of. I believe the best application to it is nitric acid.

Now, are you, without hesitation, to undertake the healing of any one of these ulcers that you may be called to see ? You are not—it would sometimes be a very

dangerous thing to succeed in. It does not at all depend on the length of time the ulcer has existed; that it has been a length of time there, discharging, is not at all a reason why you should not attempt to heal it; but if the patient has an affection of his lungs; it is not necessary that he should have a violent cough, with great expectoration, but if he has a thickness of his breathing, and that you discover clearly a tendency to organic disease of his lungs, and that you set about healing his ulcer and succeed, as you may do, you will be, as my old master used to say, his executioner. Don't meddle with it, or you will accelerate his pulmonary complaint, which, with the running ulcer, might have remained long quiescent.

Varicose Ulcers depend so much for their origin and continuance on the morbid state of the veins of the limb, that no mode of treatment will succeed in curing them short of curing the varicose veins themselves, and when that is accomplished, the ulcer will heal immediately without further trouble. A varicose state of the veins of a limb is not a simple distension of those vessels, nor does it invariably arise from causes that might distend them by interrupting the current of the blood through them, such as pressure of the gravid uterus on the iliac and other veins might be supposed to do, but is a thickening of their coats, probably the result of chronic inflammation, and an enlargement as well in their length as in their circumference. It is remarkable that the veins in some situations seem much more prone to the disease than in others; for instance, we see a hundred cases in the lower extremities for one in any other part of the body; but what is of more importance to know in a practical point of view is, that the deep-seated veins of a limb—the *Venæ Comites*, as they are

called, are rarely, if ever, affected with varix. For the cure, or at least alleviation of those varicose veins, pressure by means of rollers, laced stockings, &c., have been recommended, but they do not entirely answer. Certainly while they are worn little or no trouble, inconvenience or danger, will occur; but the relief afforded by such means is of a temporary nature; the disease remains as before their use, and is ready to assume its worst form if they are left off for a day. Knowing this, other means have been had recourse to, to effect a permanent cure. Mr. Home advised tying the saphena vein, where it runs on the inside of the knee, and many cases were given where the operation was practised with success; they were all favourable. At length one surgeon had the hardihood to publish a case where the operation ended fatally, and directly several others, with similar results, were made known by different people, and thus the practice was found to be fraught with so much danger that it seems now to be entirely laid aside. I had one case myself, where the patient got bad typhoid symptoms after the operation, and died. But there is an objection to Home's operation arising out of its inefficiency, even where the patient escaped with his life; it is this—if you tie the vein ever so well, you will find that in twelve months that vein will be as pervious as if it never was tied at all. From the danger attending the operating on this vein, and from the fact that phlebitis is not by any means so much to be apprehended from operations on the smaller veins, Mr. Brodie conceived the idea of dividing the latter, as those on the instep. The object of all these operations is to obstruct the passage of the blood through the superficial viens, and thus to direct it

through the deep ones which are not observed to become varicose. Mr. Brodie introduces a particular kind of sharp-pointed bistoury, under the skin, at some little distance from the vein, with one of its sides next the skin, it is then pushed on between the vein and the skin, the edge of the knife is turned to the vein, and a division of it is made by withdrawing the knife from the opening by which it entered; there is thus no aperture in the integuments opposite where the vein is cut. This operation is at least free from the danger incurred in cutting or tying the large trunks.

For the purpose of effecting a permanent cure of varicose veins by simple pressure, I contrived an instrument which I would call a Vein-truss; it consists, as you observe, of a spring, something like that of a truss for hernia, but shaped so as nearly to encircle the upper part of the thigh; it is furnished with a pad made to press on the saphena vein, just where it is about to enter the femoral vein. This instrument must be put on before the patient gets up in the morning, while in the horizontal position; for if he gets up before it is applied he will certainly be uncomfortable all the day afterwards. I have tried the efficacy of the instrument with decided advantage. A lady who was near bleeding to death from the bursting of a varicose vein in her leg during pregnancy, had the vein-truss applied, and she got such relief that she sent up to town for another to be applied to the other limb. An apothecary in this city, whose business obliged him to be very much on foot, and who did not like driving about in a gig, applied to me for relief for varicose veins, that had become so troublesome as to disable him from walking almost any distance; he had the vein-

truss applied, and he experienced from its use complete relief. In pregnant women I found it particularly useful.

When a varicose vein bursts, it is by a hole of very minute size ; just before it bursts it is merely covered with cuticle, and as the giving way of this causes no pain, the patient is at the moment unconscious of what has happened ; he may be walking in the street, and he feels his foot damp, which, from the dryness of the weather, perhaps, surprises him ; he takes off his boot and finds a quantity of blood in it, and is some time before he discovers the orifice from whence it came, which indeed may not be larger than a pin-hole. Now, if you are called in at such a time, you find it very easy to stop the hæmorrhage, provided you go the right way about it. If you put a large pledget over the orifice, you will not stop the bleeding. Just take a small bit of lint, moisten it with oil of turpentine, and lay it on the little opening ; over this put a somewhat larger one, over this a bit a little larger than the last, and so on until you make a pretty thick graduated compress, as it is called, and then apply a rather tight bandage over the limb. When you apply the first bit of lint keep it there with the pressure of your finger for a few minutes, until the blood coagulates, and then put on the remainder. When hæmorrhage takes place from varicose veins in a pregnant woman, it is always from some very small branches about the small of the leg, and the floor may be drenched with blood, although the opening from whence it came may not be larger than a pin-hole.

LECTURE VII.

HOSPITAL GANGRENE—ANTHRAX—FURUNCULUS—MAMMARY ABSCESS. PARONYCHIA.

THERE is another condition to which Ulcers or Wounds are subject—what is called *Hospital Gangrene*. There are two very different states of an ulcer which have been confounded under this name; for instance, when you see an ulcer this morning, suppose, you may think it is going on very well, but on seeing it next morning the patient tells you that he passed a bad night, and that he felt much pain in his sore. You see that the healthy granulations which were there yesterday are all gone; the edges appear to overhang the ulcer, and on raising them you observe several black spots; the edges are inflamed. The entire of the ulcer, however, is not always engaged, for perhaps three-fourths of it will go on to heal, or it may be entirely covered with the disease, and the discharge is of a bad kind—but this is not the worst state of the ulcer. It is one very nearly allied to hospital gangrene, but is really very distinct from it, as it may go on, and the constitution of the patient remain *unaffected*. In the case I have described the best treatment is the soothing one—such as fomentations with chamomile, mild poultices, &c.; the stimulating plan generally answers best where the appearances came on in distinct patches.

Now, if you apply red precipitate, you will form a favourable opinion next day if you find it dry and forming a crust, as it were, over the surface of the ulcer ; but if you find the precipitate has been washed away by the discharge, you may be sure that that sore will extend ; you may be certain that if it once begins to improve, it will continue to do well. When the ulcerative process extends over a large space it may become hospital gangrene, or sloughing ulcer, or phagedenic ulcer—for it has all these names ; but it occurs sometimes without wound or ulcer ; it may begin as a small pimple, which, before it is the size of the head of a pin, takes on the sloughing characters of hospital gangrene.

Hospital gangrene is just this—when an ulcer does not yield as much purulent discharge as would appear sufficient for its size—when the patient complains of having passed a restless bad night—the discharge of a bad description—the lint, which used to come off freely, now sticking to the sore, which has become flabby, ash-coloured, and always has more or less of that angry redness round the edge that is observed to surround parts falling into gangrene. The ulceration is, suppose, confined to the skin, but the sloughing is not so, for it quickly destroys the subjacent cellular substance, the fascia below it, and also the muscles ; the latter parts having exactly the appearance described by Thompson, that of a wet bladder filled with a fluid, the proper texture of the muscle being entirely destroyed. If, suppose, the disease begins in a venereal bubo, it will extend in every direction, and you will see the vessels, muscles, &c., as perfectly dissected as you would in the dissecting-room, excepting that they will not be of the natural colour ; the cellular and adipose membrane will all have sloughed

away. But no structure will be long free from its ravages; it seizes on the arteries—if the artery that sloughs be large, as the femoral, of course the patient dies instantly on its giving way, but sometimes smaller vessels are destroyed, and then the patient dies of repeated small bleedings. Hospital gangrene will make its attack on any wound or ulcer.

There was a family in this city that lost several children by hydrocephalus. Dr. Percival was consulted, in hopes he might think of something to overcome this unfortunate tendency, as it seemed, to the complaint; he had faith in issues to effect this, and accordingly ordered issues to be put in all the surviving children's arms, which was done. After some time one of the children complained a good deal of pain in his issue, and the surgeon who had put it in was sent for; he examined the part, and told the parents that the child had complained without reason, for that he saw nothing particular to cause uneasiness in the ulcer. However, the symptoms increased, the child got worse, and in short, died of the gangrenous ulcer. Some time after this I was consulted by Dr. Percival. I was asked if, under the circumstances, I would venture to put an issue in the arm of one of the children who had not had one before inserted? I said I would, if they promised that they would send for me on the slightest change taking place in the issue. This they promised, and it was therefore inserted. About three months afterwards I was sent for to see the issue, and found the surface of it covered with that ash-coloured appearance and other characters of hospital gangrene that I have described. I removed the pea at once, put mild dressing on it for a few days, the pain and angry appearance subsided, and I was then able to put in the

pea again. I was sent for ten times at various intervals, on similar occasions, and always prevented serious mischief by a similar line of treatment. I am quite certain the child would have died, as the other had done, if the issue had been neglected on any of these occasions.

The discharge from a part affected by hospital gangrene is extremely acrid: it will sometimes produce pimples wherever it touches, and these frequently take on the character of the original ulcer. It is difficult to say how far this is a constitutional or local disease, for sometimes the constitutional and sometimes the local symptoms take precedence. In the beginning the constitutional symptoms are very light and trifling; the tongue is a little white at first, but soon becomes of a bilious complexion, and lastly, brown or black; the pulse has never, in any stage, the full inflammatory feel, and towards the latter stages it becomes miserably compressible; the face has always something peculiar in it, which shows things are not going on right—it has that greasy appearance that we see in some other instances.

Is there any symptom or appearance which would authorise one to say decidedly, “this man will recover?” Not one. I have left a man at night as bad as he well could be, and next morning I learned he had had a tolerable night’s rest—everything else was altered for the better, and from that time he continued progressively to improve until he quite recovered. While there is any life remaining I would never despair in these cases; for, in the morning after a good night’s rest the redness of the edges may be going or quite gone, and he recovers. From the army surgeons, who have many opportunities of seeing this disease, it would appear that it comes on all at once,

attacking a number of men at the same time. From what I have observed, there have been few cases in this city, and in an hospital only two patients, perhaps, out of a hundred, may have it at the same time, and this induces me to think that hospital gangrene is not contagious. Whether or not it is capable of being communicated from one person to another, by using with a simple sore the sponge that had been cleaning an ulcer affected with this disease, I cannot take upon myself to say. It would be a cruel experiment to put it to the proof; but I can well conceive that a number of men in the army would be seized with hospital gangrene at the same time, without any contagion being in the case at all. Men, suppose, under the calamity of a retreat after being defeated, eating little or unwholesome food, drinking a great deal, and suffering every hardship, it is no wonder that being placed in those circumstances they should get this ulcer, and that many should get it at the same time. Sometimes a compound fracture, or a gunshot wound, will put on very much the appearance of hospital gangrene, but on the expulsion of a spicula of bone in the one case, or removing an extraneous body in the other, the ulcer heals. Hospital gangrene, therefore, cannot always be a constitutional disease, for here it obviously arises from a perfectly local cause, the removal of which removes the disease. In the commencement of hospital gangrene the patient says he is pretty well, and looked at superficially, appears so; yet if you examine him closely you will find his pulse quicker than it ought to be—his skin will have a harsh kind of heat, but you may not perceive this when you first lay your hand on him; you must keep it there for some time; but these symptoms may depend on other causes.

What are the constitutional remedies for this disease? Undoubtedly, the very best thing to be given first is an emetic; you may keep the bowels open, but much purging is to be avoided; you must take the patient off animal food—give him none at all of it; let him have cooling drinks, particularly acid ones, and remove him into pure air; bark does no good in hospital gangrene; wine they will not take, although it is a novelty to many of them; you may get them to take one drink of it, but they will take no more of it for you; they always prefer bottled ale or porter, and it is much better for them. Opium has been recommended, but what effect does it produce? None whatever; even if you begin with fifty drops of the *tinctura opii*, the patient feels no effect from it; it neither lessens the pain nor gives him sleep. As regards the local treatment—the soothing plan sometimes does good, as stupes with chamomile or poppy-heads. I think the carrot poultice, or the fermenting one, is better than the common one, as it removes the *foetor*; sometimes the stimulant plan does best with the ulcer, such as lotions of muriatic acid or vinegar; applications in the form of powder have sometimes appeared to be of service, such as rhubarb, bark, charcoal, &c.; so also have a solution of gum kino in claret, oil of turpentine, &c., but I suspect accident may have done a good deal in many of these cures, for no one can tell by the appearance of the patient, or that of his ulcer, whether the morbid characters of the latter may not change entirely in twenty-four hours. The chief object to be kept in view, in the treatment of this disease, is to take care of the constitution. The disease ought not to be called *hospital gangrene*, for it differs materially from gangrene, properly so called.

Anthrax is the next subject we shall have to consider. We saw, in other instances, gangrene or sphacelus following inflammation, and resulting from it as a cause, but the present disease is one where mortification is the first thing that happens ; it affords, then, an excellent example of *gangrenous inflammation* ; an inflammation which cannot be made to end in resolution, which will not admit of adhesion. Although no period of life can be said to be absolutely exempt from its occurrence, yet children are very rarely subject to it, as also adults until after the meridian of life ; it rarely affects the front of the body, but I have seen it on one occasion on the chin near the lower lip, and extending down the neck. In the commencement of anthrax the skin feels hard to the touch—it is red and painful ; the redness is not a healthy one, such as is seen in phlegmon, but of a dark brownish hue ; the swelling is flattened and does not point—that is, there is no part of its surface more soft and red than another, the entire being raised above the surrounding skin ; it may not exceed the size of an orange, but it often is as large as a dinner-plate. As it proceeds, a small opening forms, after fourteen or fifteen days, then another, and so on, until there may perhaps form six or eight or more of them, and from these there may ooze, on pressure, a little of a something like pus ; on looking into them you see nothing like a cavity, but a quantity of deadened cellular substance of a whitish or ash-colour, and a little good pus. These openings run into each other, the skin between them having become thin, smooth, and of a bluish colour, and finally ulcerated. If the case is to end badly, the inflammation extends, and the patient dies of the long continued pain and fever. The fever is of the low typhoid kind or something between that and the fever of erysipelas.

It sometimes is produced by the irritation of a blister; making its appearance when the blister is healed. As soon as ever you see the disease you must make an incision from one end of the tumour to the other; it is not merely the hard brawny skin over the dead cellular membrane you are to divide, but you must cut through the *margin*, and so a little way into the sound part, otherwise you will not liberate the entire slough, and if the next day you find your incision has not been made to the necessary extent, don't hesitate to enlarge it.

The necessity of cutting beyond the margin of the complaint is this:—The skin itself is diseased, but differently from the cellular membrane under it: it is thick, rough, and without the elasticity of sound skin, so that although your incision be seven or eight inches in length, the lips of the wound will not separate more than half an inch asunder. The next day, however, you will find the wound gape more, and from day to day you find them shrinking from absorption, until scarcely any remains, and you have a fair round ulcer by the time the slough has separated; this by the bye, is often a tedious process, but the constitution has been improving in the mean time, so that you need not be impatient. The operation you perform to liberate the slough is not always free from danger. I knew one patient to die of erysipelas caused by the incisions made into an anthrax. Now, poulticing may sometimes be substituted instead of the operation in very old people, but it should very rarely be trusted to, as the cure is very slow, and the constitution has to bear up so much longer against the pain and fever. You must in all these cases take care of the constitution; in some, as in healthy middle-aged people, the fever must often be treated on the antiphlogistic plan,

but in the majority, you must give wine. After the operation apply a large poultice over the part ; when the slough separates, the granulations of the large ulcer left, have a glassy appearance, but they soon become healthy, and the subsequent improvement in all particulars is very rapid. Secondary anthrax may form near the seat of the primary one, but it is seldom so large or troublesome as the first had been.

Furunculus or boil very much resembles anthrax. Like it, it consists of deadened cellular membrane under an inflamed skin, but its course is attended with exquisite pain and soreness on pressure. It is of a conical shape, with a white top, is more frequent in young subjects, and often several of them appear at the same time or in succession. Taken at the earliest period it can very seldom be dispersed ; a few times it may by smart purging, but leeches and other things of that kind are of no use ; the fever is of the inflammatory kind. The treatment is exactly the same as that in anthrax—viz., an early incision through the margins, from one end to the other.

MAMMARY ABSCESS.

THE various changes that occur naturally in the condition of the Uterus are not unfrequently accompanied by sympathetic affections of the female breast, either natural or morbid. Some of the latter may be considered at present, others when we shall have to speak of particular diseases that the breast is liable to, in common with other parts.

There is one affection of the breasts of women which mostly occurs after parturition, but sometimes before it, called *Mammary* or *Milk Abscess* ; it generally occurs within a month after parturition, but

you will sometimes meet it coming on three months after. It is ushered in with a rigor, which is succeeded by heat, sweating, thirst, and other febrile symptoms. There are many circumstances which may induce a rigor in a female at this period, but if it is to end in mammary abscess, you will find, on examining the breast, that the patient is able to point out one particular spot which is very painful, though nothing at the time may *appear* to show what is to follow. If the disease be left to itself, it is very slow in its progress—it will take perhaps a fortnight or three weeks to come forward. Even when it bursts, and the patient says she is better, and really seems to be doing very well, the painful distension relieved, and the fever greatly subsided, you will have to suffer the disappointment of finding another abscess forming in some other part of the gland, or even in the other breast.

While this suppurative process is going on, the secretion of milk is diminished, the infant's endeavours to obtain nourishment give considerable pain, not only in the affected breast, but even drawing the sound breast is productive of much uneasiness, and the consequence is a greater accumulation of milk, which adds to the distress.

The contents of these abscesses are pus, and often milk mixed with pus. Sometimes the *entire* of the breast seems to be inflamed, and gets considerably larger and harder than that of the opposite side, and is accompanied with high inflammatory fever; the patient suffers much more than in the preceding case, and its course is generally more rapid. Now, here it is not the substance of the gland itself that is affected, but the cellular substance between it and the pectoral muscle, and this form is called an *Encysted Mammary*

Abscess. Occasionally, there will be a case of this kind which will have given little local or constitutional uneasiness until the matter has come nearly to the integuments, and this it does by making its way through the substance of the gland. There are various causes assigned for the production of Mammary Abscess. If the woman is obliged from her station in life to use her arm too much while the breast is distended with milk—if there be any cause to render her distressed in mind—if she suffers great depression or excitement—if she gets a cold that produces a feverish condition of the system—if strong measures be employed to put back the milk, particularly local ones, without proper attention to other treatment, she will be very likely to get this disease.

When the mammary abscess comes on after parturition, it is surprising with what rapidity hectic fever sets in. You will have as perfectly formed a hectic fever in ten days in these cases, as you could have in three weeks in some others; but it need not give you any alarm, for, as soon as the abscess bursts, the hectic symptoms will immediately disappear. But it will sometimes happen that hectic fever will come on even after the abscess bursts or is opened. The treatment of these abscesses should be almost entirely constitutional. I do not think that the local treatment, whatever it may be, is of the least consequence. I have read of warm oil being applied to the breast, in the commencement, and wonders are told of its efficacy, but I have not tried it, and can say nothing, therefore, of its virtues from experience.

I believe active cathartics, of the saline kind, are the very best things you can give. The patient and yourself may be very anxious to have the abscess opened early, on account of the great pain and fever

it occasions, but if you do open it you cause much local irritation and profuse night sweats. Leeches do little or no good, and the exposure to cold, the slopping and the irritation they subject the patient to, often do a great deal of harm. Cold applications have been recommended sometimes, but they are not liked by the patient, and I think warm ones are better: your warm fomentations are best applied as women themselves do it—that is, to put the materials of the stupe into a wooden bowl, large enough to contain the breast, and lay it in it, covering the parts outside round with flannel. Even when the abscess feels ripe it is much better not to open it, except indeed the matter be just under the cuticle, when you may just puncture it with a lancet and let out the matter; but in general you ought to avoid the lancet in these cases, for if there be any life or thickness in the parts you cut through, you excite fresh inflammation, and greatly increase the chances of other abscesses. [An extremely foetid mass, enough to fill a large washhand-basin, was here exhibited.] The woman to whom this breast belonged was taken into the hospital for what we all thought was mammary abscess: she, however, died in three weeks, and on examination, we found the mammary gland converted into this firm substance, which is extremely like cow's udder; the fever attending this case, however, was not at all like that of mammary abscess. Whether these abscesses be opened by the surgeon or not, it is ten to one that there will be more than one abscess. Sometimes the inflammation in the breast seems running on to suppuration, and this even for ten days, and after all, matter may not form, but the affection may terminate in resolution.

When her health is bad, remove the patient to the

country—I have seen the improvement really wonderful from one day's country air. Some hardness remains after this disease, and different applications have been recommended to be rubbed on the part; but you will find that in this case the best thing you can advise is sea-bathing. I have witnessed the best effects from it. This hardness often remains for months, and might, in some cases, be mistaken for scirrhus, but there is nothing in the least malignant in it. As the child cannot suck the breast in this state, the accumulation of milk becomes very distressing, and it must be drawn by one of those bottles contrived for the purpose. Now, how often should it be drawn? If you draw it often, you excite a good deal of irritation, and if not often enough, the accumulation of milk produces fever: the best way is to be guided by the feelings of the patient. There is one circumstance which attends this complaint of a very unpleasant nature. The breast affected with mammary abscess may, in all probability, never secrete milk again. As you seldom can prevent the formation of matter, or cause its absorption when formed, your object is to bring it forward as quickly as possible. Sometimes you will be astonished at the quantity of matter one of these abscesses will contain. I have seen a quart of pus discharged from some of them.

The wound or ulcer after the discharge of the matter has a great disposition to fall into fistulæ; they will very seldom heal like abscesses in other situations. Now, if you are called in to a case in such a state, you must lay open these fistulous canals into one; you must follow them with the knife through all their ramifications, for if any of them are left unopened, the operation will be ineffectual. If in this proceeding there should be a small portion of the

mammary gland insulated, you may as well remove it entirely: it can never be of any use as a secreting organ, and may, by its presence, retard the healing of the remainder. Mammary abscess is not exclusively confined to women; it has also been observed in men; there is nothing peculiar in its symptoms or treatment differing from the same affection in woman. Abscesses, either acute or chronic, in the female breast, are by no means exclusively connected with pregnancy or nursing, although much more prevalent at those times than at others. Common abscesses in the subcutaneous cellular substance, may occur in the breasts of married or single women, as they would in other situations, but they do not differ from the same affection any where else; and you are to treat them in the ordinary way. They occasionally can be traced to irregular menstruation or more general causes.

PARONYCHIA.

THERE is an abscess which is usually found at the ends of the fingers called *Paronychia* or *Whitlow*, of which there are some varieties, chiefly owing to their seat.* One description of whitlow is a mild and trifling complaint; it is where a little collection like a spot of milk appears just under the cuticle. All that is necessary is to cut the cuticle from about this, or puncture it, and it gets well of its own accord. The second variety is where the matter forms under the whole thickness of the

* It will be *instructive*, no doubt, to students to learn, that Astruc and Camper reckon two kinds of whitlow, Heister three, Ledran, David, and Lafarge, four, Calliser five, Sauvages seven, and Francis Imbard, in his treatise on Humours, enumerates no less than eight varieties of whitlow!—*Ed. of Lect.*

skin. If it forms under the nail, the nail will inevitably fall off; but, after all, this is the worst that can happen here. The third kind, commonly called the *malignant*, is a much more serious disease. A man will go to bed quite well, but soon after he feels a dreadful pain in the top of one of the fingers, which keeps him in torture the whole night. In the morning, when he looks at his finger, there is nothing to be seen; very quickly he is seized with the inflammatory fever, and in six or eight days this runs into the irritative fever, as it is technically called—that is, where the pulse becomes much quicker, but with less strength. Sometimes the pain is so intense as to cause delirium, and yet after all nothing is *seen* in the finger itself that could account for this disturbance. So high does the fever go on some occasions, that patients have died of it and the pain and irritation caused by this form of the complaint, and some have been only saved by amputation. Often, if left to himself, the patient has a feel as if the pain and tension were creeping up the arm; it shifts first to the middle joint of the finger perhaps; some time afterwards he will tell you the pain is all in the palm of the hand; it next passes the annular ligament of the wrist, and I have sometimes opened abscesses in the middle of the forearm which began in this way. When the pain is in the palm of the hand, an opening made into that region will give exit to very little matter, and the relief is but temporary. This form of paronychia is in the sheath of the tendons, between this strong fibrous membrane and the periosteum, and it always makes its way where these sheaths are weakest, as in the cleft between the fingers. When whitlow breaks it heals rapidly, but with perhaps the loss of a finger; or the joints may become

anchylosed; or the hand itself may become stiff and useless; sometimes, where the joints of the finger do not become anchylosed, you can feel the ends of the phalanges grating on each other, being deprived of their cartilages, and the bone itself, after a time, appears to be absorbed; something extraordinary certainly does take place, for you feel the top of the finger perfectly soft, with nothing hard about it, but perhaps a bent ill-formed nail: sometimes it will be the middle phalanx that will disappear, leaving the extreme one, and quite moveable, as if only hanging by the integuments. The first and second kinds of whitlow are found generally in those who work much at their needle; the third variety is often observed in sailors and others who are much employed in pulling ropes.

How are you to treat this disease? In the two first forms you have only to treat them as common abscesses, but in the third, when the patient comes to you, whether the *finger* presents anything remarkable or not, whether any matter has formed or not—and the fact is, you can never tell whether or not there be any matter there until you have cut down on it—you are to make a deep and long incision down to the bone. You must feel the knife grating on the very bone, and it must likewise be extensive, for the tendon must slough and be cast off, and you must give room enough for this process to be effected easily. When you lay open the finger, you don't find the tendon of a bright, shining appearance, like a natural or healthy tendon, but it has a ragged, unravelled look, like one which had been a long time steeped in water, and was going into putrefaction. Sometimes, whether it breaks, or has been opened rather late, the end of the bone will make its way out of the wound, and may take a consi-

derable time before it is thrown off, but let it remain there. You may try from time to time if it has become loose enough to be drawn out gently with the forceps, and if so, remove it; but use no cutting or other violence—it does no harm except preventing the wound from healing, but too much interference may do a great deal. Should the matter be under the nail, you must cut the nail away over it, and in doing so I give you one caution—cut through the nail in the transverse direction, and afterwards the lower part will grow up over it, and there will be no deformity in a little time; but if you make your scrapings or cuttings longitudinally, the patient will have an ill-formed nail as long as he lives.

If the inflammation has come into the palm of the hand, what is it that embarrasses the surgeon? Why this—the integuments are as thick as this desk, and œdematous, and from this, and from the strong palmar fascia, under which the matter is, you not only can see no pointing, but it is impossible to feel a fluctuation in the slightest degree; a kind of pointing will sometimes show itself in these cases—not in the palm, where the matter is, but between the fingers. If you see this, let out the matter there, but if you must cut into the palm, remember you will have to go deep. Before you do this, it would be well to inform your patient that it will perhaps be necessary to make two or three cuts, for that come what will, you must reach the matter. This will make him submit easily to what he would not, if you first told him you had only to make a little cut, and afterwards he finds you may have to make several. It is probable you may have to divide an artery here; I have even seen the palmar artery divided in this operation; but suppose you must divide it, it cannot be helped, for you must cut

down until you come at the matter, or serious mischief may follow ; and even when you do succeed in this, an abscess may afterwards form in the arm. Now, you may be able to feel a fluctuation just above the annular ligament of the wrist, and to convince yourself that it communicates with a collection under the palmar fascia, and you might suppose it would be a very good thing to lay both open at once by dividing the annular ligament ; but let nothing tempt you to cut through this ligament—you can have no idea what mischief such a proceeding would cause ; in fact, death might be the consequence of such imprudence. Never tell your patient he is well until the sloughy tendon is thrown out. As to the fever that accompanies paronychia, severe as it may be, nothing can be done for it until the local disease is cured. Sometimes you will have, towards the last stages, to support the patient's constitution.

LECTURE VIII.

INJURIES OF THE HEAD—CONTUSION AND WOUNDS
OF SCALP—SIMPLE INCISED WOUNDS—LACERATED
WOUNDS—ERYSIPELAS OF THE SCALP.

WE will begin this subject with injuries of the *Scalp*, and it is necessary to consider these unconnected with any injury of the contents of the cranium, for the sake of arrangement, although much injury of the one is seldom met with uncombined with that of the parts within the skull. What is there peculiar in contusions of the scalp? There is but little, and that arises from the structure of the part itself, and from the danger of its being complicated with injury deeper-seated than in the mere covering of the skull. The integuments are connected to the tendinous expansion of the occipito-frontalis muscle by a very dense cellular structure, the fibres of which have something of a ligamentous strength, and enclose a peculiarly vascular adipose substance. Now, from the unyieldingness of this connexion, and the resistance of the bone under it, a comparatively slight blow will produce a greater effect than a severer one in a softer and more yielding part—the dense cellular membrane will be ruptured, and from the number of vessels ramifying in it, a bloody tumour will be readily produced; but from the structure of the parts it cannot well be diffused beyond certain limits, but will be impacted, as it were, at its boundaries, so as to give the margin a peculiarly hard feel to the touch, but

this is all in which it differs from bloody tumours elsewhere. Suppose a man gets a fall, and his head strikes against the pavement, which, particularly if it is convex, contuses the scalp—such contused portion must separate from its attachments below, and this separation leaves a space into which the broken blood-vessels pour their blood, and this is precisely what would happen if the contusion was over the shin-bone or elsewhere. There is nothing peculiar in the injury or the treatment of it; the blood will gradually be absorbed, and the parts will get well of themselves. If you make an early opening into this tumour before the parts are fit for the healing process, you will cause severe inflammation in and about the part, and there will remain an ugly ulcer, all of which it is necessary to avoid, as the mischief might extend to the internal parts. What you have to do is, to use some discutient to the part, and a *slight* degree of pressure, with compress and bandage, and in four cases out of five the blood will be absorbed in from ten to twenty days. Sometimes this will not happen, however, and if the tumour be placed so as to give much inconvenience—as, for instance, where a man cannot go out of doors because he finds it impossible to put on his hat, and especially if the integuments begin to inflame and point, you will then be urged to open it. This, under such circumstances, you may do after the lapse of twelve, fourteen, or twenty days, and what will you find? You may find the blood entirely fluid, or there may be a little bit of coagulum floating in fluid blood; but you do not find in any case a change of its natural appearance no more than if it had been effused but the day before. After opening it, bring the parts together, and keep them by compress and bandage, and they will quickly unite.

Now, you read that this bloody tumour of the scalp may be mistaken for a depressed fracture. Why, to a careless or superficial examiner, it may be so. If you press the centre of the tumour with the point of the finger it will yield, and you think you can feel the edges of a circular depression of the bone, and you are told you are to distinguish them in this way. Run your finger along the scalp towards the tumour, and before it gets to its soft yielding centre, your finger will have to rise over a ridge round its margin, and then it will suddenly sink, which would not occur if it was really a depression in the bone; but there is a better and more obvious method to distinguish one from the other. If the portion of bone which receives the blow be really depressed, you will always find that the scalp is depressed along with it, and there will be no tumour at all, and on running your finger over the place you feel the depression in the scalp, and the finger will sink *gradually* into the depression. When this tumour is being absorbed, you will sometimes feel as if there was a little island of coagulum floating in the blood, but this makes no difference in the case, and it will go on very well. After giving exit to the blood, the scalp will, very likely, adhere to the parts beneath without a single troublesome occurrence; but should this not be, and that the parts suppurate, still it will be a simple mild ulcer, unattended with any bad symptoms, and will gradually cicatrise as such a sore would elsewhere. We meet cases of this bloody tumour of the scalp in new-born infants, produced by pressure of the head against some prominence of bone during labour, or perhaps by instruments used for the delivery of the child; the treatment of such cases differs in nothing from that of similar cases in the adult.

It is possible to confound those tumours with others of a more grave nature, where the mistake might be productive of fatal consequences, if the surgeon were to act on it. The bloody tumour does not, in the first instance, discolour the skin. Now, there may be a deficiency in one of the bones of the head, and a protrusion of the brain take place under the skin, and if a puncture or incision was made into this tumour, I need not say to what consequences the surgeon's rash interference might lead. The way to distinguish the two cases is this—the tumour arising from protrusion will pulsate synchronously with the heart, but the tumour arising from a bruise or blow will not pulsate at all.

In the first case, you must keep the patient low to prevent inflammation; the second, is the ordinary case which will get well under ordinary treatment, or, in fact, if left to itself, without any care, in general. There are no mysteries in injuries of the scalp, uncombined with injuries of the parts within the skull, although all the writers on the subject make some; even Mr. Pott, who, I think, the clearest writer on this subject, contradicts himself, and gives opposite directions in different parts of his work.

Simple incised wounds of the scalp are to be treated like similar wounds in other soft parts; they will unite readily by the first intention. Should a branch of the temporal or frontal artery be divided in a wound of the scalp, it makes no difference in what you are to do. Just draw the lips of the wound together, and apply moderate pressure over it. If the skull is laid bare, and if you even see a little chink in it, it makes no alteration in the case, but if a fissure, in which you can introduce the handle of a dissecting knife, be made by a blunt cutting weapon, there is

some difference here, for this case is really one of depressed fracture. Suppose a wound made obliquely with a sabre which slices off a shell of bone, and on examining, you find it attached to the under surface of the scalp, if it is as thick as the external table of the skull, does this make any difference? None whatever. Leave it there; lay down the flap, and treat the case as a simple one; when you lay it, and the scalp down in their places, the bone will unite with the cranium by the first intention; but if the bit of bone be very thin and small, you must remove it, for it will have too little vitality to unite with the bone beneath, from which it was separated, and if it fails to unite, as a thicker bit would, it will act as an extraneous body, and perhaps do mischief, just as a bit of gravel would. You will, with or without this complication, keep the flap in apposition with adhesive plaster, compress, and bandage. Of course, in such an injury as this, you will have to watch your patient diligently to meet any inflammation that may show itself, with proper remedies. If the wound in the scalp be of an irregular figure, and that it would seem difficult to put its lips in apposition, and keep them so, you are directed to put a point or two of suture in it. You will not often meet such a wound here, and the less you meddle with sutures in scalp wounds the better.

Lacerated Wounds of the scalp do not materially differ from similar ones in the skin of any other part of the body; if they are not bruised they may heal by the first intention, but if they are, they must go through the usual course of such wounds any where. Some of these accidents are very extensive, and are very frightful in appearance. I have seen nearly the whole scalp torn from the bone and thrown back, and

had really to draw it over like a night-cap into its place, yet such an injury will do very well; and what is very extraordinary, but what I have remarked often, the greater or more extensive this kind of injury is, the better it will do. As to *contused* wounds of the scalp all I need say is—Don't be in too great a hurry to draw the lips of such wounds together here, no more than you would similar wounds in other parts, for these lips will be carried off by sloughing and suppuration, and if you kept them bound too close together, you would excite erysipelas. Suppose a man falls in the street, or on a road lately gravelled, and that the wheel of a waggon grazes his head so closely as to tear down his scalp, and presses dirt and gravel into it, what are you to do? Some advise you, after you have completely free'd the flap of all extraneous matter, to lay it down in its place; others, aware of the difficulty of removing every bit of dirt, &c., recommend you to interpose dressing of some kind between the scalp and the skull, with the view of loosening these extraneous bodies by suppuration, and finally drawing them away with the dressing after a few days. Now, I don't see much sense in either of these proposals. If you find dirt or gravel ground into the inner surface of the flap, wash away as much as you readily can with warm water and a sponge, but don't be too particular in washing it all off, or getting a sharp-pointed probe to pick out every little bit separately—you might be a whole day trying to do so without success; what you leave behind will be washed out by the discharge of suppuration. Should a bit of the scalp be torn away, don't mind that, but lay down the rest. On looking at this wound a day or two after the receipt of the injury, you may find the pericranium perhaps separated from the bone the

whole extent of the wound, and if you take it in your fingers you may draw it entirely away. Now, how will this end? Granulations will form, the polished surface of the bone will be absorbed by these granulations, which will then seem to sprout from the substance of the bone, the under surface of the scalp will adhere to these granulations, and all will do very well; even this separation of the periosteum then is not dangerous if the patient's constitution is not bad. When the scalp is healing you may see about the fourth or fifth day a little spot perhaps inflame, and this ends in a small abscess round a bit of gravel, slough, &c. If this be near the edge of the flap, you just take your probe and separate the adhesions a little, to let the matter, &c., escape; or if not near the edge, you puncture it with a lancet, or it bursts of itself, discharges its contents, and you have no more trouble with it. The bone itself may suffer from the general contusion, and the contused part exfoliate, be thrown off, and the case go on as favourably as if nothing of the kind had taken place. Sometimes the flap will inflame, and recede from the sound parts with which it was before in contact; you are then to adopt the ordinary means of allaying the inflammation, and apply moderate compression afterwards, with sticking plaster, compresses, and bandages.

If a *punctured wound of the scalp* be superficial, it may heal by the first intention, but if the constitution of the patient be bad, or if the wound be deep enough to have penetrated through all the soft coverings of the cranium, it will often give a great deal of trouble, and, in some instances, be attended with imminent danger. Should the wound go through the aponeurotic tendon of the occipito-frontalis muscle, matter may form under this fibrous structure. The patient

will get a rigor, indicating the commencement of an inflammatory fever, which will go on increasing in severity, even to the height of delirium, that form called *delirium ferox*. The scalp, over where the matter is about to form, is not perhaps very red, but there will be immense pain in it, and it will be acutely sensible to the touch; the swelling will be circumscribed and tense, so much so, indeed, that fluctuation cannot be felt at all. Now, you know that the cellular membrane connecting the aponeurosis of the occipitofrontalis to the pericranium is not of the same description as that connecting this tendon to the integuments. It is of that kind called reticular, and just as will happen, where matter forms in this structure under a strong fascia in any part of the body, it will create great constitutional disturbance, and find great difficulty in getting to the surface. This, then, you will perceive is a purely local affection, induced by the nature of the wound, and the tissues which it traversed; it will, therefore, require, almost entirely, local treatment. What you are to do, then, is—to make an incision through the whole extent of what you see separated, down to the bone, and let out the matter. You will also free the patient's bowels, keep him on low diet, and you will quickly restore him without anything more. Although you take every pains to persuade the man that your little incision is the safest and speediest thing that can be done to relieve his sufferings, and avert the danger he is in, yet you will sometimes fail in inducing him to submit to it. All you have to do under such circumstances is to have his scalp stuped and poulticed, to lower the system, and perhaps in a little time the wound may get wider, the matter make its way out, and he finally do well. The matter, however, does not always get exit through

the original wound, but will burrow on until it appears over the outer angle of the eye, or behind the ear, or elsewhere, at some distance from where it began, and at length escapes. This, then, is simply matter forming under a fascia, but if the man has lived an intemperate life, or has a bad constitution from any other cause, he may get instead—

ERYSIPELAS OF THE SCALP.

Now, this may result from all sizes and descriptions of wounds. It is not on the nature of the wound that it depends, but on the state of the patient's constitution. It seldom comes on before the second day, but after that, it may happen at any stage of the wound—nay, even when the wound is healed; but it generally occurs about the third or fourth day. Where matter forms under the aponeurosis the swelling is *hard* and *circumscribed*, while in erysipelas it is soft, red, and diffused; the eyelids, ears, and the face in general are very much swollen; in the former case they are not engaged in the swelling; the digestive organs are always in this case much deranged. Abscesses may form here, but I never saw them *point* in the situation of the wound. It has been said, that patients who have died of this erysipelas owed their death to a metastasis of the inflammation to some part within the cranium. Now, I made it my particular care to investigate the truth of this supposition, by opening several patients who died of this affection, and never saw the least trace of inflammation in the membranes of the brain, or any where within the skull. Mr. Wilmot, who was employed in the same pursuit about the same time, opened several patients who died in Jervis-street Hospital of this erysipelas,

and never met an instance of such a metastasis. There is really nothing peculiar in this erysipelas of the scalp; it does not differ from the same disease any where else. It often occurs without any local injury of the scalp, from wound or contusion. In this case no particular attention is necessary for the local injury. The affection will be ushered in with a rigor, perhaps pains in the back or limbs, nausea, headache, and thirst; the tongue will be browner, rough and dry; the pulse will be frequent and small, and sometimes hard, the bowels will be irregular, and the urine scanty and high-coloured. The first thing you will do is to give an emetic of tartarized antimony, so as to cause full vomiting. As soon as the stomach is settled, give five or six grains of calomel with compound extract of colocynth or aloes, and follow it up with a saline purgative. You then continue the use of tartar emetic in diaphoretic doses. When the patient is *quite* free from the disease, it will be well to have his head shaved two or three times, for if the hair is left to fall off of its own accord, which it is likely to do, it will not grow well again—it will always be more or less deficient in quantity.

LECTURE IX.

INJURIES OF THE HEAD—CONCUSSION—INFLAMMATION WITHIN THE CRANIUM.

A man may receive an injury of the scalp without the parts within the skull suffering in consequence, but more or less disturbance of the internal organs is a much more frequent occurrence. Now, it may happen that there shall be neither wound nor contusion of the scalp, yet the patient may die of injuries of the internal parts. Let us take a case: A man falls off a ladder from a height of ten or twenty feet, and pitches on his head; he is taken up insensible and brought to the hospital; his head is shaved, and the most minute examination can find nothing wrong in the scalp. Yet there he lies, insensible; his pulse 40 or 50; it may be regular, or it may be intermittent; his respiration slow; his breathing stertorous; his lips and countenance pale, and his body cold. After a time, however, his lips resume their redness, and his heat returns to him, but he still snores. You speak to him, but he does not answer a word, nor can he swallow; and he gradually recovers out of this state, after a day and night, perhaps. Although, immediately after the receipt of the injury, he passed his urine and fœces involuntarily, he now becomes sensible to the calls of nature, and thus he gradually but steadily improves, and in ten or fifteen days is quite restored; the time he takes to arrive at this is, however, very variable. The intensity or duration of

the symptoms is by no means proportioned to the force of the blow, or the severity of the injury. When the patient recovers out of the state I have described, he finds himself, perhaps, paralysed on one side, or has lost his hearing, or the sight of one or both eyes, or his sense of smelling, and I am sorry to say there is no cure for these that I know of; or perhaps he recovers, with some derangement of his intellect, not amounting to madness, however.

The length of time a patient may remain in this insensible condition varies very much in different cases. I have known patients, having the symptoms above mentioned, recover so far in three or four hours, as to get anxious to be allowed to go home to their business, totally ignorant of how they got to the hospital, or what caused them to be sent there.

If such a case as this is to end badly, the patient does not recover from the state of total insensibility—there is no sign of rallying whatever, and he dies gradually.

If, while in the insensible state, you find his breathing slow, and his pulse perhaps 120 in a minute, or if his breathing be quick and his pulse slow, that man will die. I never knew a patient under those circumstances recover in whom the number of respirations and pulsations had not the natural proportion to each other. Well, how do this man's functions go on? His eyes are shut, and if you open them, you sometimes will find the pupils dilated, and sometimes contracted. He seems perfectly insensible, yet if you pinch him, or attempt to bleed him, or to cut his scalp, there is no man who will struggle more, or roar louder than he will.

On examining a case of this kind after death, we find the parts in one of two conditions—either we

shall not be able to discover a single vestige of any thing unnatural in the cranium or its contents, after the most minute examination, except, perhaps, that the brain does not exactly fill the cranium; and even of this fact or appearance I am very much in doubt. Now, in this case we say the man died of *concussion*—Or we find, on raising the skull-cap, a stratum of blood between the bone and dura mater, or between this membrane and the pia mater; or sometimes we find the substance of the brain itself lacerated, and blood effused between the separated parts; or we may find a coagulum of blood in the ventricles, or about the base of the brain. When the blood is between the bone and dura mater it is circumscribed, and generally in small quantity; but when it lies on the free surface of the arachnoid membrane, between it and the dura mater, we find the coagulum thin, and very much extended, and, what is important in a practical point of view to remark, it does not simply lie on the arachnoid, but actually *adheres* to it by means of coagulable lymph, showing the impossibility of removing it during life. Now, in this case we say the patient died of *compression* of the brain. But recollect that either of these conditions of a patient may exist, although he actually has received no blow or other violence on his head at all. If he gets a fall on his rump, the concussion or violence may be propagated to his head, and may cause either of these sets of symptoms or appearances.

Well, is there any symptom that will enable us to determine, positively, whether a man in this state labours under concussion or compression? I do not think there is. Writers, even the best of them, differ as widely as it is possible as to the leading characters of each state—the pulse, the condition of

the pupils, the way in which the patient breathes, &c., have been noted, and attributed to one state or the other, without the possibility of coming to any certain conclusion from these conflicting opinions—a fact that in itself is sufficient to prove that the same symptoms may exist in either case. The older surgeons have contested the matter warmly, and some modern ones, as Mr. Abernethy, give several distinctions to guide our diagnosis, but careful observation will show that they are all common to the two states. I am quite positive that during life they cannot, in almost any case, be distinguished.* We must therefore treat them alike. If, indeed, a man recovers instantaneously, or in an hour or so, we may say it was concussion, but this is very rare : or, on the other hand, if, with the symptoms I have mentioned, we see the patient bleeding from the nose, eyes, mouth, and ears, we may reasonably infer that such injury has been done as to cause rupture of some internal vessel, and that compression has some part, if not the chief or

* When a pupil, I made many dissections in my hospital with the view of detecting some symptom or set of symptoms that might establish a diagnosis in these cases. The result, which has at least satisfied my own mind, is, that the only symptom in an unmixed case of compression or concussion of the brain that can be relied on during the patient's life, for a true exhibition of the real state of the case, is to be found in the temperature of the skin. In some fatal cases where I could discover no lesion of texture after death, the patient's skin was *cold* from beginning to end, and whenever there was effusion of blood, or depressed bone, the skin was of the natural temperature, and in some cases even rather above it. A theory might account for this, but I do not presume to offer it to the profession. I mentioned what I have stated to Mr. Colles after this lecture ; he seemed interested, and said he would test it. The great difficulty seems ever to have been to get an unmixed case.—*Ed. of Lect.*

only one, in the effect we witness. Sometimes when a man is taken up insensible, if there be an officious person present, he will take out his lancet and proceed immediately to bleed him; but this would be very wrong. There is here a recession or depression of life, and in such a case, I think it possible (although I have never seen an instance of it) to kill a person by bleeding him at this time. This observation is not peculiarly directed to a depression from *this* particular cause. I think you might kill a man by bleeding him during a weakness caused by his merely looking at a slight cut he gave himself in the finger.

How are we to treat this man who labours under these first symptoms of concussion? Why, if he is cold at the surface put something warm about him, and give him a warm drink, if possible; when he recovers a little, we then should bleed him, and while bleeding him we shall find his pulse grow quicker if he is benefited by it, the brain having been relieved by the operation. *This* bleeding we do from our observations in practice, and we repeat the bleeding afterwards from theory, to prevent extravasation. Now, in bleeding a man in this state, there is one thing you should never let out of your memory—viz., that although he appears quite insensible, the moment he feels the lancet he will start forwards in a way that will astonish you: never go bleed such a man without having one or two stout persons to hold him while you make the puncture. If you find his pulse gets more frequent, you may let the blood flow to the extent of twelve or twenty-four ounces, according to circumstances, and you will free his bowels by smart injections. We can go no further at present. If his pulse gets from 50 to 60, and you see no further improvement for 12 or 24 hours, you may bleed again.

Now, suppose a man has dined and drank freely, and in this state received the injury in his head, you find him trying to vomit, straining a great deal without being able to get up anything. You must give this man, first of all, a powerful emetic; there is less danger in a full vomit than in this continual straining. When a man gets this injury, some will think they cannot be half busy enough, and will blister and bleed him, and so forth. In fact, the patient's friends, and often the surgeon himself, think that when they see a person in this state, too much cannot be done to bring him out of it, but time must be given for the brain to recover itself, and when one in this state makes any approach towards recovery, in nine cases out of ten, or at least five out of seven, that recovery will be progressive. You must keep the patient on low diet; but do not be precipitate, or over zealous to do too much, nor repeat your evacuations too quickly when you find the symptoms begin to yield—that is, when consciousness begins to return, when he ceases to pass his urine and fœces involuntarily, &c.

It has been advised to exhibit stimulants in the first instance to these cases—to give wine, ammonia, and Dover's powder; but recollect that stimulants of any kind would produce a ten-fold reaction in any person reduced to this low condition, and one of the chief things you have to watch, and to use every means in your power to control, is too great a reaction, which, even where stimulants have not been exhibited, is, unfortunately, often more than a match for the best directed and vigorous efforts. As to wine, it is a very improper thing to exhibit in such a case—it never should be given—and as to Dover's powder, it does no good whatever, but may do harm from the opium it

contains—a medicine quite unfit for those head affections, particularly in the early stage. When the patient is able to swallow, the best thing you can administer is a dose of some purgative medicine of a cooling nature, and that will be likely to rest on his stomach. There is nothing more variable than the pulse in injuries of the head. A man's pulse may beat but sixty in a minute while lying quietly in his bed; but make that man sit up, and immediately it rises to one hundred and twenty; very slight exertion will quicken the pulse in this manner. Do not, therefore, mind every little acceleration of the kind.

It will sometimes happen, that although when a patient is taken up, after receiving the injury, he seems to have hardly any life in him, yet, by-and-bye, he begins to mutter, and, after a little time, he becomes perfectly delirious; but he has a method in the midst of the delirium. If left to himself, he will perhaps get up and dress himself; if he wants to make water, he goes regularly and looks for the proper vessel, and uses it like any man in his sober senses; his pulse is, however, very quick; his movements unsteady; his eyes are morbidly acute. Now, I consider this a much worse case than when the patient is thrown into insensibility. I have, of my own knowledge, observed this delirious state to occur but in *extravasation*, but I believe it occurs also in concussion. As I mentioned before, when such a patient recovers, he may have lost his hearing or sight, &c., and this is beyond our ability to cure. There was a man in Steevens' Hospital who fell through the well of the staircase, and the only injury he received of any consequence was an amaurotic condition of his eyes, for which various remedies were tried without effect: in twelve months afterwards he got a fever,

and during the fever he recovered his sight, and from that time to this he has not had a return of his complaint.

Now, if our bleedings, &c., don't relieve the patient whose case we have been supposing, and that his pulse, instead of rising, gets from sixty to fifty, ought we to trepan him? There is, we'll say, no sign, no mark on the scalp to direct us, or there may be five or six marks of contusion on it. You will find in books various methods laid down for ascertaining, under such difficulties, *where* we should apply the trepan. One says, if you press the scalp here and there, the patient will give signs of uneasiness or feeling when you press over the spot where the extravasation or injury lies. Now, if you *do* trephine here, it is an equal chance you will find nothing. If several surgeons grope and poke the man's head, they will make some one spot a little more tender than the rest—in fact, you have nothing to guide you as to the place where you are to apply the trepan, and yet we must do something to give the patient the only chance left him for his life.

We are told that the blood must lie between the cranium and dura mater, or between this membrane and the pia mater, or between the layers of the latter, or in the substance or cavities of the brain; but if it is in either of the last two situations, of course it is out of our reach altogether. Now, if the blood be between the dura mater and the bone, what harm can it do there? Although the patient may remain for two or even three days insensible, the blood does not continue to be poured out all that time, for the closeness of the adhesion of the dura mater to the bone limits the quantity of the extravasation, and also the great strength and unyielding nature of the membrane itself—so that the thickness of the coagulum is not

greater than the thickness of a shilling, and sometimes not half so much, about an inch or an inch and half in diameter, and of the hundreds of cases we see recover from such accidents without any operation, it is hardly possible but that some of them must have had such extravasation; in fact, we are not without evidence that even large coagula, comparatively, have lain for a considerable period within the skull, and in much more critical situations, without producing any serious effects, after the first that followed the rupture. The blow on the instant separates the dura mater from the skull, and a little blood is thrown out from the wounded vessels; we trepan the patient, and are, perhaps, congratulating ourselves on the improvement we have effected, for he appears more sensible, perhaps opens his eyes and speaks, but the next day we find him worse. It is then said, "Oh! the extravasation is under the dura mater." Well, we cut through the dura mater, and what do we find? A little thin coagulum resembling, exactly, in appearance and consistence, currant jelly; here there is no mechanical hindrance to the effusion, and accordingly dissection shows that it is sometimes spread over half or the whole of the surface of the brain, has dipped in among its convolutions and ventricles, and as I before remarked, is adherent to all the parts with which it lies in contact. Now, what advantage can the case derive from your proceedings in those cases? Absolutely none. But our operation may do service, should the symptoms that at first led us to perform it arise, as they sometimes do, from another cause than extravasation; namely, a fracture and depression of the internal table of the skull, while the external table remained perfect and could give no clue, on inspection, to the state of the case. Here we certainly must employ the

trephine as the last and only chance to save the patient's life. Before undertaking any operation here, we should tell the patient's friends the nature of the *chance* we are about to give him, to prevent their harbouring hopes it may not be in our power to realize. We do not apply the trephine until everything else has failed. In a case of extensive extravasation, recovery, under any circumstance, is rare. A man gets a wound or blow with a broad weapon, and in seven or eight hours he is reduced to the last extremity. Why, here you can't make the man worse. The blow may have caused a wide separation of the dura mater, and consequently a large extravasation, the removal of which may be of great service. If you find the symptoms are very bad in the beginning, and grow worse, you must apply the trepan, as the patient's only chance. If you do trepan, what do you find? A coagulum, which perhaps you can't get up, and perhaps a cavity into which you could put your finger up to the second joint; in this case you must make a second perforation, and afterwards cut the two into one, and thus make room to get out the coagulum, and after you do all this, the patient goes off quietly. Pott tells you that the blood and dura mater must grow putrid, and cannot be got rid of by any effort of nature, but there is no want of evidence to show that blood extravasated into the cranium will be absorbed as it would be in any other situation, and does not grow putrid. If, after the removal of the coagulum, you do not in a little time see the cavity lessen, by the rising of the dura mater to its proper level, you may be certain that patient will die. I never saw a single case recover in which the dura mater continued depressed into a cavity, after the blood which had caused it to be so, had been removed.

WELL, now, let us suppose a man falls, and pitches on his head, and is taken up insensible, and after two or three days having apparently recovered of the injury, you find him up and walking about the room ; if you ask him how he is, he says he is very well, or perhaps he complains of a slight pain in his head—will you pronounce this man out of danger ? No ; he is really in great danger, and of what ? Of *inflammation of the contents of the cranium*—the symptoms of which do not show themselves earlier than the sixth or seventh day, and do not come to their height until the twentieth day. How does this inflammation begin to show itself ? You come to your patient in the morning, and he tells you he has passed a bad night—he did not well know how it was, but he was tossing about in his bed, and could not sleep—perhaps he had some nausea or vomiting. You see something not right about his eyes—they want their natural lively expression—there is a dulness in his eye, and this is one of the strongest marks of the approaching mischief ; I do not know how to describe it, but it has a different appearance from the eye of a person in common fever. Sometimes it begins with a rigor—slight at first—but as matters proceed the rigors become tremendous ; he shakes the bed under him ; and these are followed by the most profuse sweats, which are generally most severe on awaking in the morning. These rigors do not succeed each other at regular intervals—they are what are called irregular rigors—his pulse gets weaker, he begins to rave, and at length is convulsed, but only on one side, and this is the side opposite that on which he received the injury.

Suppose the case was one of simple contusion without any wound of the scalp, and that matter is forming within the skull, you will find the scalp puffed

up into a tumour, which does not give the distinct feel of fluctuation, nor that of air, but as if it contained a mixture of matter and air, and it will grow larger. If you cut into this swelling the first day you will only find a little thin fluid in it, but if you open it after some days you will find pus, and the pericranium separated from the bone. Suppose that at the beginning there had been a wound in the scalp, what change will you see in the wound? Why, the suppuration, which was going on well before, will be altered; the dressings, which used to come off easily, will now adhere to the wound, and before you remove them you can perceive that a thin exudation is making its way out through the lint. Suppose it had been a lacerated wound which before was granulating, you now find that the surface of the wound has become smooth, shining, and uniform—that appearance which gets the name of “glassy;” the granulations having entirely disappeared, the pericranium is found detached from the bone.

LECTURE X.

INJURIES OF THE HEAD—INFLAMMATION WITHIN THE CRANIUM, CONTINUED—FORMATION OF MATTER.—FRACTURES OF THE CRANIUM.

AT our last meeting, I mentioned some of the symptoms by which approaching inflammation of the parts within the skull was ushered in, and the changes an open wound of the scalp would undergo in such an event, and that if the wound had healed, the cicatrix becomes swollen and painful. We are told that there is great intolerance of light in such a case, but this is far from being a constant symptom, for many patients express none whatever, and others merely dislike a very strong light. It is set down in books as a pathognomonic sign of the mischief, that the patient has a feel as if a cord was drawn tightly round his brain; but these symptoms are not to be relied on as exclusively belonging to this case; for in common fever, there is intolerance of light, and a man may have inflammation and suppuration of the brain without any intolerance of light whatever. As to the corded pain in his head you cannot rely on this, for if you ask the patient has he a pain of that kind, or of any other kind that suggests itself to you, he will say he has. With respect to the appearance of the wound in this case, you cannot rely on it as a certain sign of matter forming within the cranium, for it may take on this appearance from other causes. For instance, the blow on the head that originally caused all this,

may have deadened a portion of the external table of the skull, this deadened portion of bone will exfoliate, and the wound will not resume its healthy state until it is thrown off, and this of course may happen without any formation of matter within the skull. I have met two cases of inflammation and formation of matter within the skull, during the whole progress of which the patient complained of nothing particular, except an oppression or "load" about the heart.

You see, therefore, that you are not to think these appearances or symptoms very important, or place too much reliance on them ; but you must bear in your mind one fact, which will render you cautious in your prognosis on these occasions. It is this—that patients have died of inflammation and suppuration of the brain, without ever having had a single one of those symptoms laid down in books as always accompanying it, and without the slightest alteration in the wound. I recollect having examined after death a man who died of abscess of the brain: this man's wound had healed as well and as readily as any simple wound in any other part could have done, and the only constitutional disturbance or ailment he complained of, from beginning to end, was a little weakness.

In fact, *any* constitutional cause, unconnected with the injury of the head, will produce all the symptoms and appearances said to indicate the formation of matter within the skull. Why—even the very remedies you employ may produce them ; for instance, the man has been once or twice bled, the vein may inflame, and all those symptoms result from the phlebitis. When, therefore, you find these symptoms present themselves, see if there be any other inflammation in the body present ; or if there be, from any

other cause, a derangement of the system; or if the fears or other mental affections of the patient have any share in them; see if there was any irregularity in the patient's diet, &c., before you pronounce your opinion on these symptoms.

Although the symptoms of inflammation of the parts within the skull do not appear until the seventh day, yet it is not at that period that the inflammation has begun. You will often find pus formed within the skull forty-eight hours after the injury has been received; in fact, the inflammation was going on from the very beginning, but the symptoms did not appear until it had got to that stage which caused the constitution to sympathise with it; and this you know is not peculiar to *head* diseases—it is what may happen in inflammation any where.

Old Mr. Dease mentions it as an extraordinary matter that one man will have his skull broken and a piece of bone come out, and yet this man will recover perhaps without a bad symptom; while another of similar age and constitution, will die of inflammation of the brain, although he has only received a tap of a cane on the head. This was a great puzzle to all the older surgeons; but the solution of the mystery is just this—that one was a temperate man, and the other had committed some irregularity in eating or drinking, &c.

I have endeavoured, as far as I have gone, to point out to you that many circumstances may exist to modify your treatment in any particular disease, in different individuals—that the previous constitution, habits, age, sex, &c., of your patient, must always enter into your serious consideration when administering to that patient, no matter what the name of his complaint may be, or what general rules may have been

laid down for your guidance. All cases of injuries of the head of the same kind are not to be treated alike, no more than similar injuries in other parts. For instance, you must not bleed and purge men as long as they have any life in them. If a patient is strong and plethoric, you must lower *him* to the necessary point, and adapt the activity of your measures to his strength; but if your patient is naturally of a weakly constitution—is already very low—you must not think of reducing *him* lower. A strong active soldier, for example, who has been well fed and well trained, and his wife, who has perhaps a delicate bad constitution, and is addicted to dram-drinking, should not be treated in the same way in any possible case requiring medical relief. There is really nothing mysterious or peculiar in the treatment of injuries of the head; you must regulate your practice by the rules that would direct you in inflammation elsewhere.

Now, it is *diffuse* inflammation that causes death in the great majority of those cases. In the suspected case of the formation of matter we perforate the skull, and find a small quantity between the bone and dura mater; but cut through the dura mater, and there will be found matter diffused for some distance on the surface of the pia mater, the effect of the diffused inflammation, and this diffused inflammation is always owing to a bad constitution. Much, therefore, will depend for successful practice here on our care of the constitution. Well, how are we to manage this? I believe on the first day those symptoms show themselves, the very best thing you can do is to give an emetic, and put the patient on low diet. This will be all that is necessary to be done on the first day, as you will thus allow yourself a little time to learn whether what you have noticed be really

the forerunner of inflammation within the skull, or whether the symptoms are merely those of common fever, the simple result of the wound in the scalp; or may not have arisen from some irregularity in the stomach or bowels, or imprudence in the patient himself. Inflammation of a vein that had to be opened in the first instance might readily lead one into error as to the state of the case—more particularly as the symptoms announcing it frequently do not show themselves for several days after the venesection has been performed, and the fever soon changing from the inflammatory type to the typhoid; but if you only examine the arm, you are immediately sensible that, however the head be concerned in your patient's state, there is enough in his arm to occasion it all.

Surgeons formerly were very anxious, when they discovered the corded pain in the head, and vomiting, to treat it immediately as inflammation of the brain, but I believe the practice is now laid aside by every observing practitioner. Read Pott, and you will really think you never can trepan often or soon enough, but recollect, the operation itself may cause inflammation of the dura mater; and that this is not a mere matter of opinion, I will tell you an incident in proof, which I heard either old Mr. Dease or Mr. Obrey mention. It is valuable for this, that it would be difficult to find another instance where trepanning was performed, and where the consequences could not be attributed to anything but the operation itself.

Dr. Evatt had taken it into his head that lunacy was owing to the brain becoming too large for the cranium to hold it, and, full of this notion, he succeeded in getting permission to try if he could cure it by trepanning. Accordingly, three lunatics, in

sound bodily health, were subjected to the operation ; and what was the consequence ? Why, that two out of the three died from the experiment ; and recollect they were all in perfect health previous to the operation.

After inflammation of the brain has once commenced, what chance has the patient from the trepan ? Very little. When you cut a piece out of the skull, and find no matter, you are told to cut through the dura mater to find it, and you get such directions concerning the signs by which you are to know if it is under that membrane, that one would think every thing was as plain as if you could see the matter through it. They tell you that, on raising the piece of bone, you will see the surface of the dura mater rough, and that you can feel a fluctuation quite plain in it ; but no—the dura mater is thickened, and you really cannot feel anything like fluctuation. These instructions are of no use to you in the living subject. But if there even *was* matter below the dura mater, you might cut the bone, and through the membrane covering half the surface of the brain, before you could evacuate it : the matter here is *not fluid* ; it will not flow out ; it *adheres firmly* to the parts on the surface of which it lies. But there may be such a thing as a circumscribed abscess just under the dura mater, which could be evacuated, and therefore, as such a case *may* be, you ought to give the patient the chance, little as it is, of saving his life ; but perhaps from the beginning to the end of your professional career, you will not save two people by the practice. Where there happens to be this circumscribed abscess, however, the patient will die of diffuse inflammation, if you neglect to trepan it. I recollect the first case I ever had was a child, who was brought to

the hospital with puffy tumour of the scalp, about the size of a gooseberry; none of us could tell what to make of it; it was opened, and about a spoonful of matter was discharged; the child, however, died, and on examination, we found matter within the skull, which had, as one might say, corroded the bone, and was making its way through it. Here is a preparation of the child's skull, and you see how nature was endeavouring to evacuate the matter, by causing an absorption of the bone. In this case I think if the child had been trepanned it would have recovered. I did, some time after this, perform the operation on a child under similar circumstances, and it recovered; but in fifteen or sixteen years afterwards, it became affected with epilepsy. I forgot to bring here the preparation of this patient's skull, but will show it to you another time. When you have to cut through the dura mater, let it be by a simple longitudinal incision, not a crucial one, as some have directed, which would only add to the chance of a protrusion of the brain, and not to the freer discharge of matter. The apparent improvement in the patient's sensibility after the trepan, is generally owing to the temporary stimulus of the operation, and perhaps, in some cases, to the small quantity of blood lost during its performance.

FRACTURES OF THE CRANIUM.

WE shall now speak of Fractures of the Cranium. A simple fracture of the skull does not necessarily cause any bad symptoms whatever. If, therefore, a man gets a wound of the scalp with such a fracture, we are not to stuff the wound with lint, to see what will follow, no more than we would treat a compound fracture of the leg in this way. No; we should cover

the bone quickly, and treat the case as a simple wound of the scalp. Should the wound be a lacerated one, with a fracture under it, does this make any difference? None whatever. Just treat it in the same way. Some direct you to follow the track of the fracture with your knife; but you might have to cut away to the base of the skull, or into the orbit, to follow it; and after all, to what purpose? I am sure if those who give such a direction were asked their intention or object in following a fracture, they could not tell. A blow struck on the parietal bone may cause a fissure that will run round to the base of the skull, and be stopped perhaps by the *foramen magnum*, or some of the foramina in the orbit. As then it would answer no purpose if you even did know the extent of the simple fracture, your object must be to cover the bone quickly, to prevent suppuration of the soft parts. If you should not even succeed fully in your intention of a speedy union, when you bring the integuments over a fissure in the skull, and that an abscess should afterwards form under the scalp, surely it is no great pain to the patient to open it again. Therefore cover the bone at once: all you have to mind is the constitution. Simple fractures of the skull seldom require the application of the trepan in the first instance; and if there should not be constitutional symptoms to call for the operation, performing it in anticipation, as it were, would rather tend to excite, than avert inflammation of the contents of the cranium; but there are cases where they do—for instance, a portion of the internal table may be depressed although the external table of the skull remains at its proper level: here you must perforate. Sometimes you see blood coming rather freely from the wound in the scalp, you wipe it away, and still it

flows; you examine it more minutely, and you perceive that the blood is oozing up through the fracture in the bone. Although the patient recovers the first effects of the injury, and is even able to walk about, still the blood is coming. Well, here you *must* trepan, for, in this case, the blow has ruptured either a sinus or the middle artery of the dura mater. Now, you are cautioned against the application of the trepan over a sinus, or over this artery. Certainly, if there should be no positive necessity for the contrary, we may as well avoid these parts, but there need be no dread in applying the trephine over them if circumstances render them eligible on other accounts. If a sinus be opened the slightest pressure is sufficient to stop the hæmorrhage. If the blood should shoot up to the ceiling from the artery, a little bit of lint will, in general, be sufficient to control it—or, if not, it can be detached and included in a ligature. In general, the simple exposure to the air will be enough to stop this bleeding. Well, you must trepan in those cases, and remove the blood that has been effused, and which you will find partly fluid and partly coagulated. Here is a preparation of the skull of the child I mentioned, where matter had formed within the cranium, had caused absorption of the bone, and had made its way under the scalp. If we had trepanned over the seat of this circumscribed abscess, I think the child would have lived.

In depressed fracture of the cranium, the bone may be starred or broken into several pieces, and many of those pieces may be depressed; or simply one piece. Now, let us first take the simplest of these two cases. Suppose a fracture of the parietal bone with a simple depression. This was a case where the old surgeons would have trepanned immediately, supposing that all

the mischief arose from the pressure of the bone ; but they forgot that every one of the symptoms attending such a case were often present without any depression or even any fracture at all, and many recovered without any operation. A depressed fracture does not call for the *immediate* use of the trepan, but we should not cover up the parts the same as in a simple fracture. Our great attention must be directed to the constitutional symptoms, and if in one, two, or three days, we find our remedies produce no alleviation of these, then we should trepan ; to wait so long can do no harm, if the case will permit it. In many of these cases you can raise the depressed bone without the trepan : the elevator or the common dressing forceps will often be sufficient for the purpose. If any depressed pieces of bone cannot be prevented from wounding or irritating the dura mater by other means, or if it be perfectly loose, and have lost all connection with the adjoining parts, so as to be incapable of union, we should remove it. In very small depressed fractures, where a loose bit of bone is sunk into the brain, it will be prudent to postpone any trial to remove it for a few days ; for, if we attempt to catch hold of the depressed portion immediately after the injury, the first touch of the forceps sinks it more deeply into the brain, but if we wait for two or three days, the brain under the bone will become more firm by the adhesive inflammation, and its resistance will enable us to lay hold of the piece of bone with more safety to the patient. Recollect, these depressed fractures are always more dangerous than simple ones, as they are more likely to cause inflammation of the parts within the skull ; but the symptoms of compressed brain do not correspond in severity with the size of the depressed bone, or the depth to which it is

sunk. Depressed fractures, which are very trifling to look at, often produce very alarming symptoms, and a frightful looking fracture may be attended with comparatively slight and transitory symptoms. You must therefore be very guarded in your prognosis in these cases.

As the fracture in the skull is only to be regarded according to the constitutional disturbance it has, or is likely to produce, we must guard against inflammation of the brain or its membranes by the strictest antiphlogistic regimen; we must purge the man, and keep him as quiet as possible. This inflammation within the cranium may come on from a wound of the soft parts exterior to it, but of course is much more likely to follow a fracture of the bone, particularly those attended with any depression, but remember it does not *necessarily* follow any of these injuries. You have therefore no means of knowing whether there be a fracture or not, unless the bone be laid bare, and then it can be seen.

Exfoliations are not common, and when they do occur, they are very slow in their progress, and are not generally attended with any bad symptoms, even where both tables are affected. Should a patient with a slightly depressed fracture recover, without any means having been employed to raise the bone to its former level, and that he is under seven years of age, the bone will in time be found to have risen of itself, and no ill effects will follow the injury; but if the person be advanced in life, the bone will not rise, and in a few years he will be likely to be attacked with epilepsy. I have seen even considerable depressions in children rise of themselves.

Sometimes, when there is a small wound, we are enabled to see the depressed bone broken into pieces,

and jammed, as it were, into the dura mater or pia mater, but are not able to satisfy ourselves as to the extent of the injury or what relief we might be able to afford. Here we should dilate the external wound in the direction of the fracture, to a sufficient extent for our purpose. Sometimes we are able to detect such an injury by the touch, although there is no wound of the scalp, and if so, we are instantly to make an incision into the integuments, with a light hand, lest we depress the fragments still farther, and giving ourselves room enough, we remove as many of the pieces as we can do readily and with safety. You must recollect that fracture of the skull, whether simple or depressed, does not destroy the adhesions of the bone to the dura mater as a matter of course.

Suppose you are called in immediately after a man has received a severe injury of the head, and that you find a piece of his brain in his hat, or that it comes away in his night-cap after he is laid in bed—does this make any difference in the case? None whatever. Many such cases have done very well: many well authenticated cases are on record, where a considerable quantity of the brain has come away, and the patient did very well. Such a case is therefore to be treated as if no such occurrence had taken place. In some of these injuries the brain will come away immediately after the occurrence; in others, on the first or second dressing, with a little blood; there will be a very fœtid smell, and the wound may continue to discharge brain for five or six days before death. It will push up the dressings, get from under them, and run down the face. All this may happen, and be perhaps accompanied with symptoms indicating very great danger, yet such cases will sometimes get well in a few days.

It will sometimes occur, in three, six, or eight days after the operation of trepanning has been performed, and after the patient has recovered from the first effects of it, that a fungus shoots up luxuriantly from within the skull: when this takes place, the patient will hardly recover. I believe there are two kinds of fungus observed after trepanning. In one, there is nausea, vomiting, &c.; in a word, fever, and the patient gets worse from day to day. Here there is not a new growth of the brain, but a deviation—a protrusion of the brain itself caused by extravasated blood in its substance. Nothing will cure this case. In the second case, and whenever the patient recovered, I believe it was a regular fungous growth from the dura mater, which, becoming strangulated by the margin of the trepan hole, and by the granulations shooting up from the dura mater itself, has dropped off without any assistance, and the patient recovered. In the first case pressure has been tried, and what was the consequence? The patient dropped down in convulsions the moment it was applied. Shaving it off has been tried, and the patient died instantly. In every case, and under any treatment, the patient dies.

A Gunshot Wound in the Head is the most dangerous description of wound that a man can get, for the points of contact between the ball and the bone are so small, that the effects of the stroke are immediately transmitted to the brain. The ball will sometimes go half round the cranium external to the bone, and after death you can trace on that man's *brain* the exact course the ball took. The ball will often lie in situations where an anatomist could never suppose there would be room enough for it, as just at the upper and back part of the external angle of the eye, in the temple. Sometimes you will see the ball half buried in the

bone, and the other half sticking out. This is the most dangerous case of all, for the ball has driven in the internal table upon the brain. But a ball may strike, suppose, the forehead, and will not enter the skull, nor even injure the skin, yet cause a train of very formidable symptoms; these will afterwards be found to be produced by a fracture of the internal table of the bone, which is depressed or thrown in upon the contents of the cranium. This inner table of the bones of the cranium is certainly much more brittle than the external table, and deserves the name of "*tabula vitrea*," which the old anatomists gave it, and we find many instances accordingly where external violence of various kinds injures this table without sensibly affecting the outer one.

Injuries of the head sometimes cause death in a way not often mentioned. A man gets a blow which does or does not fracture the skull; he is greatly depressed; gets lower and lower, and at last sinks. Matter may or may not have formed in this case; but on examining this man's brain, you find a portion of it beneath where the blow was received, and extending no farther than the apparent boundary of the external injury, converted into a substance exactly resembling flummery in appearance and consistence, and the eye can clearly distinguish the boundary between this altered portion and the surrounding sound brain; this may arise from any injury, but it generally follows gunshot wounds of the head. Sometimes a man will appear to have recovered *perfectly* from an injury of the head, and without the slightest warning he will suddenly drop down dead. I saw a soldier who had sustained an injury of the head, and who had recovered so far as to be able to get up, and dress himself and walk about; he was at length dis-

charged from the hospital; he complained of nothing, but just as he got to the gate of the hospital he dropt dead. On examination, this man's head showed an abscess in the substance of his brain. During his stay in hospital he complained of nothing particular after the first effects of the injury had subsided.

The elder Mr. Dease believed there were certain cases of injury of the head which never recovered. I do not recollect whether it is in his work, but I remember he used to mention in his lectures a case which you all may have seen. As a patient with one of those injuries lies in bed, it will sometimes be perceived, that the external auditory canal is filled with a clear lymph, which rises to a certain height, but does not overflow. You get a bit of sponge and sop up this as far as you can see, but the ear again quickly fills, and this happens as often as you may try the experiment. Now, I have seen cases like this recover. In two or three days the lymph ceases to come, after which a slight crust of blood forms in the ear, which in a few days separates, and the patient gets well. Mr. Wilmot had a case of welling of the ear which recovered.* This appearance certainly does indicate great danger, but it is not a certain sign of a fatal termination of the case.

* I have seen, at least, two cases recover where there was this lymphous welling in the ear, besides other bad symptoms. One was a case of the late Dr. Duggan's, and the other, I think, belonged to Mr. Adams—both in Jervis-street Hospital.—*Ed. of Lect.*

LECTURE XI.

INJURIES OF THE HEAD—TREPPANNING—CONCLUDING OBSERVATIONS—"PRACTICAL PRECEPTS" ON INJURIES OF THE HEAD.

BLEEDING from the nose and ears, although sufficiently alarming in injuries of the head, is not, after all, so very dangerous a symptom. It indicates, it is true, that the fracture has extended to the base of the skull, but many of these cases have recovered. There is one case where the patient will not survive—it is where, as sometimes happens, one or more of the sutures of the cranium are separated by the violence. Though depressed fractures will often recover, yet, as in the case I have already mentioned, epilepsy may be the consequence subsequently. This, it would appear, arises from a growth of bone internally which presses on the brain. I have here a preparation of the skull belonging to the case I alluded to, of the boy who returned to me after several years with epilepsy, and you see a spicula of bone growing down into the brain. We find these growths of bone into the brain in cases which we cannot trace to any external injury—an Exostosis, as it is called, and the subjects of it have, as in the present case, been attacked with epilepsy. The perforation made by the trepan is never repaired with bone. Here is the preparation of the skull of a man who died twenty years after he had undergone the operation of the trepan, and you see there is no at-

tempt at osseous reparation; there is merely a thinning of the edges, from which the dura mater and pericranium stretch across in contact with each other.

Besides what I have already mentioned on the subject, there is another thing that should deter you from employing the trepan without great necessity: it is a case I never saw but once, but it made a strong impression on me. There was a man who had been trepanned; he recovered, and remained in good health until a long time afterwards, when he was put into the Sheriff's Prison; there he soon learned to drink, as most people do who have the misfortune to be put there: this, and the confinement, injured his constitution, and after a time, a small ulcer broke out in the cicatrix of the old wound—the bone under it partook of the mischief—it exfoliated, and the patient died of diffused inflammation of his brain.

After carefully considering all the circumstances of the case, and deciding that nothing but perforating the skull can give a reasonable chance of saving your patient's life, you will then proceed to the operation of trepanning him—that is, removing with a saw of this description a portion of the bone. Now, here is the old instrument for the purpose called a Trepan, it is a circular saw worked something in the manner of a carpenter's bit-and-brace. It is seldom used in these countries at the present day, although perhaps in cases where much pressure of the instrument would not be advisable, as in children, it might be still employed. Here is what is generally used, and which is distinguished from the other by the name Trepine: it is worked in half circles, and where a thick skull is to be perforated, it really requires no inconsiderable labour to accomplish the object. The crowns of the old instruments were often made of a variable shape, tapering towards

the teeth, and this form was given to it to prevent it suddenly sinking into the brain when the piece had been nearly cut through; and certainly if any one could be so careless as not to try how far he had gotten, and moderate his pressure accordingly, it might prevent the catastrophe. It is, however, next to impossible to get through any thickness of bone with it, and with ordinary precaution the modern trephine is, in every respect, more eligible. There is here a centre-pin within the crown of the saw, the point extends a little way beyond the teeth, but it can be entirely withdrawn by a spring or slide: the use of this pin is to keep the saw steadily in the one spot, for those who have not steadiness of hand to dispense with it in the first movements of the trephine. The head having been shaved, and before commencing the operation, your first care must be to have the patient's head supported by some solid resisting substance, such as a very small pillow, or a couple of folds of blanket on a table. If the head be placed on a large pillow or bolster over a feather bed, there will not be that resistance to the working of the instrument, which is very necessary. Having disposed yourself and your patient in the most convenient manner, you commence a single longitudinal incision, with a light hand, through the soft parts. This will be enough without cutting out a circular piece of the skin, as some, absurdly enough, have advised, or a triangular or crucial incision, neither of which are required to give space enough for the saw; but you must make your cut long enough to leave plenty of room, for if the soft parts get torn by the teeth of the instrument, you will not be able to heal them afterwards without an ugly ulcer. Should the forehead be the part on which you are to operate, a transverse incision will

leave less subsequent deformity than one made in the longitudinal direction. Should you find, on exposing the bone, that your incision is not large enough, it is easy to cut at right angles through one of the sides in whatever direction circumstances may require. If the pericranium be not already separated from the bone, you may cut through it where the saw is to be applied. Now, you are told not to begin sawing the bone until the bleeding from the incision in the scalp stops; not even if you had to wait three or four hours for it; but a trifling degree of compression will control any bleeding of the kind, and you may go on. If the part you have to saw be very convex, you must use the central pin, or perforator, as it is called, until you make a groove in the bone sufficiently deep to prevent all danger of the instrument slipping. This is even more necessary if you use the *trepan*, for your hands cannot keep it so steady as the trephine, although in the latter it must be occasionally employed too; but if the part of the bone you act on be flat, you will hardly have to employ the centre, when you have acquired a little dexterity.

There are some very dangerous directions given by writers about cutting through the bone. You are told you may work on boldly until you see blood coming up from the diploe, or until you can feel you have got to the diploe by the greater freedom with which the saw works. But remember, there are parts of the skull on which you may have to operate, where no diploe at all exists; that in some skulls there is hardly a diploe in any part, and this last fact you have no means of ascertaining until the piece is taken out. When you have worked some little time, remove the saw, and examine how deep you have gone; take a quill or a toothpick, and run it round in the groove,

and observe if you have gone a little deeper on one side than another, and if so remember to lean a little more to the opposite side the next time, and, particularly if there be any oozing of blood, clean the teeth of the saw with the brush. Before you get quite through the skull, or, as you may think, nearly through it, raise the piece with the common elevator and forceps. Some irregularity must remain, and you should take away all the spiculæ you can ; you will, in general, however, have but little to remove. After doing what more may be necessary for the case, you replace the integuments and cover them lightly, so as not to prevent the exit of any discharge.

If the patient is to do well, you will find that in a few days the dura mater will granulate and unite with the scalp. In general there will be a trifling exfoliation from the edges of the aperture made by the saw, and therefore if the wound in the scalp is tedious in healing, and does not look quite so healthy as you think it ought, there may be sufficient to account for this in the retention of the crumb of bone which has separated, without reason for apprehending more serious mischief there. Now, sometimes you find the aperture made by the crown of the trepan is too small for your purpose, and it must be enlarged : this you do by making a second perforation at the necessary distance, and in the required direction from the first, and divide the intervening part with Hey's saw. This instrument will be very useful where a piece of bone is depressed below the level, and overlapped by another, and will much shorten the operation in cases where a number of separate perforations would otherwise be required. In some fractures with depression, we don't find it necessary to do anything for its elevation. If the bone is broken into many pieces, a sufficient space

for the elevator may be found without using the trephine at all; but take care to have a good purchase for the elevator. In some of these comminuted fractures, you may, by cutting off a projecting piece of bone with Hey's saw, make room for the elevator.

As soon as we have elevated the depressed bone, we have done all that is in our power to do for the patient, at that time, and our future proceedings must be guided by circumstances. I should have mentioned that when a part of the bone is not much depressed, we must include its edge in the perforation as well as the corresponding edge of the bone from which it has been broken, and which afterwards makes our fulcrum. From the circumstance of fracture of the internal table of the skull by a gunshot wound, with little or no external injury, being a frequent occurrence, we are justified in employing the trephine in those earlier than in most other cases; and as this kind of injury is not always caused where the ball first strikes the head, we should be particular in our examination of the neighbouring parts, and in watching the appearance of the puffy tumour in every part. Where a suture is engaged in an injury done to the bones of the head, there will be a peculiarity in the consequences that should be always kept in mind—at least this peculiarity does very often present itself, that there shall be two distinct collections of matter, one on each side of the suture, without any communication between them. If, then, we trephine on one side, and give exit to some matter, but that little relief follows, we should not hesitate to operate in a similar manner on the other side of the suture, or include the suture in the first instance. Trepanning over sutures has been objected to, as a general practice, on account of the more firm adhesion of the dura

mater in those places than in most others ; but in the present case the objection is overruled by the advantages of a single operation instead of two, which is not a trifle, when at all sufficient. The bleeding from a sinus, or the middle meningeal artery has been so far from being a cause of apprehension, that it has been encouraged, and even a large sinus opened with a lancet, as a good means, opportunely given, for local depletion—a practice, however, I do not recommend for general adoption when practicable.

In mentioning gunshot wounds of the head, I should have alluded to cases you may read of, of balls lodging in the skull, and even inflicting injury on the brain and its membranes, and of their being afterwards removed by the trephine at some distance from where they entered. I have not witnessed such cases myself, but in a man with a good constitution, I can conceive the thing possible ; but do not announce hopes too confidently on one or two rare cases, for gunshot wounds of the cranium, even when they do not penetrate into its cavity, are always to be considered as of the most dangerous description of any injuries that could happen. There is often considerable debility remaining, on the recovery of a patient from any severe injury of the head ; therefore when you know you may do it with safety, give bark, and the best way perhaps is in effervescent draughts. It may happen that the external table of the cranium is fractured without the internal sustaining any injury. It is obvious that there can be but very few situations in which this can occur, as at the frontal sinuses, where these cavities happen to be very large, and the force extending but over a small portion of the surface of the bone ; this may sometimes be attended with a limited emphysema. The outer table, in such a case, may even be somewhat

depressed, and in the process you adopt for elevating it, (if any be deemed necessary) you will not necessarily open the cavity of the cranium. When fracture occurs in both tables, or the two walls of the sinus, and that the application of the trephine is required, it is recommended to apply the crown of a moderate-sized instrument, first to the outer table, and then to perforate the inner one with an instrument a little smaller, to allow it to work easier and with less danger of accident. I omitted, I think, to mention one circumstance attending certain cases of contusions and wounds of the scalp. It is this : When the injury is inflicted on the forehead, near the superciliary ridge, and that some of the branches of the frontal nerve are bruised or divided, it may occasion loss of vision in one or both eyes. Now, this of course you are not answerable for, nor can you do much to restore the sight—whatever time may do ; but suppose a case of acute inflammation of the eye, for which local bleeding would be the appropriate treatment, you might attempt to open the frontal artery as it leaves the orbit, on account of its direct communication with the affected organ ; but in doing this the nerves could not be avoided, and thus, while relieving the disease, you might unfortunately destroy the functions of the eye. You will therefore on no account meddle with this vessel, as a means of taking away blood.

From considering the great importance of the subject I have now concluded, and anxious that you, gentlemen, should not misunderstand anything I have said on it, and that if the result of my experience, which I have laid before you, should possess any value, that you may retain the substance of it at least in your memory, I have caused to be printed a few

practical precepts, of which I beg your acceptance as a mark of my sincere esteem, and a return for your kind attention. The plan of this little work has been borrowed from a similar publication, by the late Mr. Dease, the first Professor of the Practice of Surgery in our College. I have ventured to make considerable alterations in the arrangement, and such additions to the matter as have been supplied by the present improved state of surgery. I have made Mr. Dease my guide, because every man who has read his larger work, "Observations on Wounds of the Head," must see that the principles which he there inculcates, are now received as established truths, and are acted on as rules of practice.

PRACTICAL PRECEPTS ON INJURIES OF THE HEAD.
INJURIES OF THE SCALP.

Contusion.—A blow of a blunt weapon, in general, detaches the scalp from the pericranium. The separation takes place to a greater or less extent around the seat of injury. Into the receptacle thus formed, and also into the broken cellular substance which surrounds the cavity, blood is poured from the ruptured vessels.

There is danger of mistaking such an ecchymosis for a depressed fracture; because the border of it, raised and hardened by the blood which is impacted amongst the cellular substance, resembles the elevated circumference of a depressed fracture; while the central part, soft and yielding, allows the finger to sink apparently below the level of the scalp.

If you open such tumours in an early stage, you will induce a high degree of inflammation and fever, which will be followed by suppuration of a very bad character.

By means of cold lotions applied to the tumour, by the antiphlogistic regimen and quiet, the extravasated blood will generally be absorbed in the course of ten or twenty days.

If, at the end of ten or twelve days, the tumour should continue undiminished, especially if the integuments begin to inflame and point, you may then make an incision sufficient to give exit to the blood ; after which keep the parts in apposition by compress and bandage, and they will quickly unite.

Wounds.—Simple incised wounds of the scalp are to be treated as similar wounds in the other soft parts. They will unite by the first intention.

If the bone be so cut that a scale of it be raised along with the flap of the scalp, replace the parts, and treat the wound as an incised flap wound of the scalp only : such a wound frequently heals as if it were merely a wound of the soft parts.

In lacerated flap wounds of the scalp, replace the flap and retain the parts in apposition by gentle compression, with bandage, &c., &c.

In contused wounds, if small, approximate the parts, but do not bring them into very close apposition ; because a greater or less degree of suppuration and sloughing must follow.

Contused flap wounds are to be treated by laying down the flap after you have endeavoured to wash clean the surfaces. As soon as the process of sloughing is finished, bring the parts into the closest apposition, and retain them by adhesive plaster and bandages.

Should you dress the surface of the wound and the flap separately, the flap would, from day to day, become more thick, more unyielding, and more narrow ; so that when you wish (after the process of sloughing)

to draw the flap over the surface from which it had been raised, it will leave more than one-third of that surface uncovered.

Punctured wounds of the scalp are to be treated as similar wounds in other soft parts.

This class of wounds is sometimes followed by a circumscribed painful swelling, accompanied by inflammatory fever: these consequences arise from the *inflammatory tension* of the aponeurosis, and are most speedily removed by dilating the wound of this membrane.

Erysipelatous inflammation with fever is not an unfrequent consequence of wounds of the scalp, arising, however, rather from constitutional than local causes. The treatment should be the same as for erysipelas attendant on wounds of other parts. The event sometimes proves fatal. On examination after death no traces of inflammation of the brain or of any other disease of that organ can be discovered.

In wounds of the scalp, (generally speaking,) the antiphlogistic regimen should be enjoined, not merely to moderate the local inflammation of the integuments, but also to guard against the more serious danger of inflammation of the internal parts.

CONCUSSION AND EXTRAVASATION.

THE primary or immediate constitutional effects of injuries of the head are, loss of sense and of voluntary motion, stertorous breathing, slow labouring pulse, involuntary discharge of urine and fæces, &c. Every possible variety occurs in the violence and duration of these symptoms, from a slight stunning to absolute and almost instant death. The intensity or duration of the symptoms is by no means proportioned

to the force of the blow, or severity of the injury. Dissection discovers two different states of the contents of the cranium, in those who have exhibited the above symptoms. In some, blood has been found widely spread on the pia mater over one or both hemispheres, or extravasated into the ventricles, or about the base of the brain; while in others we discover no effusion, no rupture, no disorganization of the brain: the only remarkable appearance which presents itself is, that this organ seems not to fill the cranium completely. This latter class of patients are said to have died of concussion of the brain; the former class, of extravasation.

The same train of symptoms occurs in both these forms of internal mischief. The same line of treatment is applicable to both.

In case of recovery, these symptoms in general slowly retire; the sensibility and voluntary motion gradually return. In a few instances the patient suddenly recovers possession of his faculties.

Venesection, repeated if necessary, purging injections, purgatives by the mouth, and occasional blisters, should constitute the plan of treatment.

When the symptoms begin to yield, we may entertain good hopes of recovery. We must not then repeat the evacuations in too quick succession.

Should this plan of treatment prove ineffectual, and should the condition of the patient become more and more alarming, we may then think of applying the trephine; for in some few cases it has happened that by the blow the dura mater had been detached for a wide space from the cranium, while at the same time a fracture of the internal table had torn the middle artery of the dura mater, or some one of the sinuses, and thus a large quantity of blood had been

collected between this membrane and the skull. With the faint and uncertain hope of finding such an extensive separation, and such a large collection on the surface of the dura mater, we should apply the trephine. In general, however, this operation affords but little chance of relief, because the effused blood lies, not on the surface of the dura mater, but is widely spread over the pia mater, and tenaciously adheres to that membrane.

Whenever the usual symptoms of concussion and extravasation are combined with epileptic fits, spasms, or convulsions of any of the muscles of the face, carefully examine whether there be not a fracture, and whether a splinter of bone has not wounded the dura mater.

In a few instances of injuries of the head the patient is affected in a manner very different from that described in the beginning of this section. He has a wild look ; talks much ; frequently gets out of bed ; has a tendency to vomit ; his pulse more than naturally quick ; his breathing neither slow nor stertorous.

INFLAMMATION AND SUPPURATION WITHIN THE CRANIUM.

PATIENTS who have suffered from extravasation or concussion of the brain, may, after the removal of all the symptoms attendant on such mischief, be seized with symptoms of suppuration within the cranium.

The probability of such a consequence is not to be estimated according to the severity of the original injury ; for suppuration has followed injuries of the head in which no wound of the soft parts, no fracture of the skull had taken place, and where the symptoms of concussion had been very trifling and transitory.

On examination after death we generally find a small quantity of purulent matter lying (at the site of the blow) on the surface of the dura mater. When we raise this membrane, we find nearly the entire surface of the hemisphere covered over by a yellow purulent fluid, which adheres so tenaciously to the pia mater that very little of it will flow off; indeed, the colour and consistence of this fluid would lead us to suppose that it was formed of a commixture of pus and coagulated lymph.

Nausea, thirst, headache; quick, full, and hard pulse; restlessness, pain, and corded feel of the head, are the constitutional symptoms said to be indicative of this mischief.

The local symptoms, in cases without wound, are a tumour of the scalp, puffy and tender, but not painful to the touch. In cases accompanied with wound, the surface, which had been healthy and granulating, will become pale, glassy, and flabby; instead of good matter, it will discharge only a thin, discoloured sanies, the dressings will stick closely, and the pericranium instead of adhering firmly to the bone, will separate from it, and that even to some distance, around the edges of the wound.

The symptoms indicating suppuration within the cranium never appear at an earlier period than the sixth day; generally between the eighth and twentieth days.

We are not, on this account, to conclude that the *inflammation* has only begun at this period. Dissection has proved that matter has been formed within the cranium so early as the third and fourth days; so that the above symptoms mark not so much the commencement of the inflammation, as the disturbance which the system suffers from the matter formed within the skull.

To avert this inflammation and suppuration, we must take our measures from the very first day of the injury. Blood-letting, largely and repeatedly employed, according to the condition of the patient, with a strict attention to the other parts of the antiphlogistic regimen, constitute the means most likely to succeed with the generality of patients.

The trephine should never be employed as a means of preventing inflammation of the brain and its membranes.

Rigors, fever, and the other symptoms said to denote internal suppuration, may arise from a wound in some other part of the body; from inflammation and tendency of the injured bone to exfoliate; or from the ordinary causes of fever; therefore be not too hasty in applying the trephine on the first appearance of such symptoms. Search well for every other cause which may have excited the present disturbance in the system; use the means ordinarily resorted to for the relief of febrile symptoms; and if, notwithstanding these attentions, you perceive an aggravation of symptoms, then have recourse to the operation.

This operation must necessarily prove unsuccessful in the majority of cases, because the inflammation is diffused, and the fluid is spread on the pia mater, not on the surface of the dura mater, as had been formerly imagined.

In a few instances, however, the matter is formed in a circumscribed spot on the surface of the brain, with adhesion between the dura and pia mater, and occasionally with a splinter of bone forced through these two membranes into the substance of the brain. The early application of the trephine will save such patients; but if it be too long delayed, this operation will, even in such cases, prove ineffectual; because the

matter of the abscess being pent up, will irritate the adjoining portions of the brain, and give rise to the diffused inflammation along its surface.

Should the operation fail of bringing the wished-for relief, and only a small quantity of matter be found on the exposed dura mater, we will have neither any certain guide to indicate the presence of fluid lodged beneath this membrane, nor any strong encouragement to divide it. Should the desperate condition of the patient urge you to this measure, you will perceive only a very small quantity of serous fluid to flow through the opening.

After the operation of the trepan, the integuments should be laid down again, but not brought into such close apposition as to prevent the escape of pus.

The constitutional treatment must be regulated by the particular circumstances of each case.

When fungus of the brain shoots up, pressure will not restrain it. Removing it by ligature is ineffectual; by incision is mortal.

FRACTURES OF THE SKULL.

SIMPLE (undepressed) fracture of the skull is not productive of any symptom or condition by which, when the integuments remain entire, we could be certain of its existence. Blood issuing from the nose, eyes, or ears, affords a strong presumption of fracture passing across the bones which encompass these organs.

In simple fracture, accompanying an incised or lacerated wound of the scalp, we are required to be particularly attentive to bring the lips of the wound into close apposition, and procure their speedy union.

To trace the extent of a simple fracture is equally

unavailing and unnecessary; for such fractures too often pass from the top or sides to the base of the skull, until stopped by the foramen magnum; and surely the fracture, if left covered, is more likely to unite without much inflammation, than if it be exposed, to satisfy an idle curiosity.

The early application of the trepan to a simple fracture must tend to excite, rather than to avert, inflammation of the contents of the cranium.

The constitutional treatment of such injuries should consist in the most sedulous employment of the means calculated to prevent inflammation and suppuration of the brain and its membranes.

Depressed fractures.—The symptoms of compressed brain do not correspond in severity with the size of the depressed bone, or the depth to which it is sunk. In some slight cases of depressed fractures, the symptoms of compression are alarming, while in some severe injuries of this kind the symptoms are comparatively slight and of short duration.

If the case be not urgent, we may postpone the attempt to elevate the depressed piece, until symptoms of inflammation begin to show themselves. Many such cases have had a complete recovery, although the bone remain depressed.

In depressed fractures, attended with severe symptoms of compression, we must quickly raise the depressed piece to its proper level.

This, in very open fractures, can sometimes be accomplished by the elevator alone. Where there is not room for this instrument, or where the form and circumstances of the fracture require the removal of some part of the skull, we should apply the trephine to such parts, and in such manner as will facilitate the elevation of the bone. In general, we will find it of

advantage to make the trephine comprehend the border of the fracture.

Mr. Hey's saws will be found of great advantage in removing the edge of these fractures when of any considerable length.

If any depressed piece cannot be prevented from wounding and irritating the dura mater, or if it be perfectly loose, and have lost all connection with the adjoining parts, so as to be incapable of reunion, such piece should be altogether removed.

In very small depressed fractures (such as may deserve the name of punctures of the bone,) where a depressed bit of bone is sunk into the brain, it will, perhaps, be prudent to postpone the operation for a few days. For, if the operation be performed immediately after receipt of the injury, and if we attempt to seize the depressed fragment, the first touch of the forceps sinks it more deeply into the brain; portions of the brain, from the softness of its texture, rise up, and conceal the bone both from our sight and touch; whereas, if we defer the operation for a few days, we give time for the adhesive inflammation to take place; this circumscribes the depressed piece, hardens this spot of the brain, and thus enables us more easily and certainly to lay hold of the fragment of bone.

The older surgeons prohibited the application of the trephine to certain parts of the skull; but when the circumstances of the case require it, we should not hesitate to apply it even to those prohibited parts.

Wounds of the brain must be treated on the same principles that regulate our practice in the treatment of the other injuries of the head.

LECTURE XII.

DIVISION OF THE FRENUM LINGUÆ—HARE-LIP—EN-
CYSTED TUMOURS OF THE EYELIDS, &c. INJURIES
OF THE THROAT.

Division of the Frenum Linguae.—Children are often brought to the surgeon as tongue-tied, but for one of them really requiring operation, five at least will not have need of it. Sometimes the fold of mucous membrane, called the *frenum linguae*, extends so far forwards, and binds the tongue to the floor of the mouth so closely that the child cannot suck well, nor will be able, at a future day, to enunciate well, if something is not done for it. To divide the *frenum* with a pair of sharp scissors is a very simple matter, but you will guard against wounding the ranine artery, or what is much more in danger of being wounded, the ranine veins, for small as they are, they will pour out a great deal of blood, if opened, more than an infant could bear to lose. If it were not that the bleeding is induced and kept up by the act of drawing the breast, it is probable that it would soon stop of itself; but, under the circumstances, the blood will be swallowed with the milk, and the nurse have no knowledge of the matter until it is too late to remedy the mischief. You will, therefore, incline the scissors backwards and downwards sufficiently, and there can be no danger. Sup-

pose, however, one of those vessels should be wounded, you might touch it with spirits of turpentine on a small dossil of lint, or with a point of lunar caustic, and you will generally succeed in arresting the bleeding ; but the parts should be watched carefully. It has been advised to take up the lingual artery when everything else had failed to stop the bleeding. You know the lingual artery lies just above the corner of the os hyoides, at the most convenient part of its course for taking it up, or a little exterior or behind this point—so that you have a fair guide to it. You will take care to avoid including certain parts in your ligature that your knowledge of the anatomy of this region will indicate—such as the lingual nerve, the superior laryngeal nerve, &c.

HARE-LIP.

THERE is a malformation seen sometimes in the upper lip of infants at birth called hare-lip, which causes great deformity in many instances, but always more or less ; and not this disfigurement only, but, according to its extent and complication, may be productive of serious inconvenience during lactation, and even in after life. On this account, and as the affection is not of very rare occurrence, it has attracted much attention from surgeons from an early period. Perhaps the most general and simple form it is seen under is that of a cleft, extending from below the septum nasi, downwards through the whole thickness of the lip ; sometimes it is not in the middle line, but begins beneath one of the nostrils, and when this is the case, the cartilages of that side are stretched out, and the nostril is widely dilated. Sometimes there is the appearance as if there were two fissures, sepa-

rated by a central projection, which, however, never reaches down as far as the margin of the lip, and is often but a little tubercle. Not unfrequently the upper jaw-bone is involved in the deformity, the alveolar process and palate plate being divided by a fissure corresponding to that in the soft parts. The fissure in the lip is not straight as if cut with a knife, but its edges are rounded, as if scooped out, and of course there must be some cutting to make the parts lie evenly together in contact. In simple hare-lip, the operation is easy, and the best instrument to perform it with is a knife, except sometimes, perhaps, with very young children, with whom the scissors may be more convenient, and when used, it should be one of considerable strength. Your object in the operation is—to convert the margins of the fissure into even straight lines, and make them in their whole extent raw edges to favour their union with each other. To effect this, you make two incisions as high up as you can, beginning each at a common point above the commencement of the fissure. You take care to hold the side of the lip *firmly* in your fingers, and not to let it slip or escape until you have cut through its whole substance; you then make a similar incision through the opposite side, including all the rounded edges, and their irregularities in the two straight cuts; these will of course divide the coronary arteries, but pressure by the assistants will be sufficient to control their bleeding; you need never employ a ligature on them. You next take two needles, and pass each through all the structures of the lip, except the mucous membrane. If you leave any thickness of the lip behind not transfixed by the needles, a gaping will remain that may permit a serious bleeding from the coronary arteries, which you know run

at the posterior surface of the lip close to its lining membrane, and, if the child is on the breast, the act of sucking will induce and continue this bleeding, the blood will pass into the stomach, and the occurrence not be discovered until too late to save its life. The loss of a very small quantity of blood would be hazardous in a young child. You push the first needle through the lip near its margin to ensure evenness at that part. Having passed the needles through, you twist a ligature in a figure of 8 shape from one to the other, and assist their purchase on the lip by strips of adhesive plaster, of sufficient length to include the cheeks; you then, with compresses and bandage, complete the resistance to any force tending to separate the cut edges from each other.

You will sometimes find the lip adhering so low down to the alveolar process, that it will be necessary to begin the operation by dissecting it from the bone. If a nipple-like portion of lip projects between the upper edges of the fissure, just include it in your V-like incisions and remove it. Should the alveolar process project so much as to make you apprehend its thrusting itself between the parts you wish to keep in contact, you may remove it with a bone-nippers—it will give little or no additional pain. Should a tooth project, extract it with a tooth forceps. If the nostril be much widened out, you must separate it from its adhesions, bring it to its proper position, and retain it there. If there be a fissure through the palate, it will often be found to close up of itself in some time after the cure of the fissure in the soft parts: if it should not, you must have recourse to some mechanical contrivance to prevent the serious inconvenience that the existence of this fissure would probably cause to the patient through life. I

shall have occasion, at another time, to say more on the subject of an artificial palate for the redress of accidental, as well as congenital deficiencies of the hard palate. As the needles should not be let to remain in longer than is absolutely necessary to allow a certain degree of adhesion to keep the parts together with the aid of the sticking plaster and bandages, you might remove them, in general, on the third day, but if the parts seem much on the stretch you might let them remain in until the fourth. To withdraw them, there is no necessity first to untwist the thread from about them—just take the larger end between the forceps, and gently disengage them, one after the other, by a gentle rotatory motion. If the threads are glued to the part by blood or lymph, leave them there until they become loose, or until you know that you can take them away without disturbing the wound: of course you will not meddle with the sticking plaster, but if you see a want of them, add a few more strips, re-apply your compresses and bandages, and keep the parts at rest until you find the adhesion secure. Silver needles with moveable steel points have been contrived for hare-lip suture, but I think the common, or glover's needle better; you should wrap a little sticking plaster or wax round their points after introducing them to protect the cheeks.

Now, what is the period at which you should undertake the operation for hare-lip? No doubt the earlier you perform it the better chance you will have of a speedy cure; but infants at a very early age do not bear operations well—many of them will be seized with convulsions and die, if subjected to a more trifling operation than this we have been considering. I think between the second and third year the best period.

Tumours in the Eyelids.—Small tumours of the encysted kind are often met with in the structure composing the eyelids: if let to take their own course, they will continue to enlarge, and cause a very disagreeable deformity, and what is of more consequence, even will in time greatly interfere with the motions of the lid, and of course with the functions of the eye to the same extent; they, however, have nothing malignant in their nature, and may, therefore, be removed at any period without hazard. Now, when you come to examine one of them, it rolls about so freely under your fingers, that you would be led to suppose that all you would have to do would be to make a small incision over it, just large enough to let it through, and that a little pressure would make it start out from the wound; but you will find that this is rarely the case, for you will have a good deal of trouble in dissecting it from its attachments without wounding the cyst, which it would be well to avoid, or you will add to the difficulty. You will make your incision through the skin of the eyelid transversely, and somewhat larger than what you might fancy enough to let it escape. Some employ a little point of suture to keep the lips of the wound together from the trouble of keeping adhesive plaster on, but this is not necessary if you keep a light compress on the lid for two or three days. Those little tumours are not always in the same place as regards the structures of the lid. They are deeper seated at one time than another, and if they are nearer the lining membrane than to the skin, you may cut through the palpebral conjunctiva, and extract them without wounding the integuments. To know whether one of them is in front or behind the orbicularis muscle, all you have to do is to watch when the child cries, or to get the

older patient to throw that muscle into action, and if it be next the skin the tumour will be only made more prominent, but if deeply seated, it will be flattened by being compressed between the ball of the eye and the orbicularis. When you remove one of these through the conjunctiva, you will have nothing more to do than to let the lid fall down into its place, and keep it so for a day or two.

Cysts, containing a serous or watery fluid, form in many situations, as in the orbit, either at its upper or lower part—in the neck, the mamma, &c., and such should be removed with the knife early, as they sometimes attain a considerable size, and then their removal would be attended with much greater difficulty, with greater chance of a return, and sometimes with troublesome hæmorrhage. It is always desirable to remove the cyst entire; but this you can hardly do if it should have been wounded in the progress of separating its attachments. If they have attained a very large size, you cannot attempt, in most cases, to dissect out the cyst. Under these circumstances, you are advised to treat them as you would a hydrocele of the testicle—that is, to puncture them with a lancet or trocar, and evacuate their contents; and if you deem the chances of success greater than those of a return of the complaint, or the risk attending the trial, you may inject them as you would the hydrocele to effect a radical cure. The contents of encysted tumours are of various kinds, and you never can tell, by the most careful manual examination, what the nature of the contents may be. Sometimes a ball of hair has been found in one of them—sometimes a substance, which, in colour and consistence, exactly resembles honey. There is one kind of tumour I have not unfrequently met with in the integuments of

the thigh : it is not as large as the nipple of a woman's breast, yet it is attended with very great pain—it is not merely on pressing it that it gives pain, but whether touched or not the pain is excessive. Now, any palliative treatment you may employ in this tumour does not signify in the least in relieving the distress which it produces : the only thing to cure it is to cut it out. Occasionally they will get well of their own accord, and the patients will have no more trouble with them ; but if an incision will relieve a man of a local affection that keeps him in continual torture, there is no sense in waiting for a possible cure to take place spontaneously.

INJURIES OF THE THROAT.

DEATH by suffocation may result from many diseases and injuries of the throat. Among those which demand the most prompt attention are foreign bodies stopping in the œsophagus, and in such cases we are suddenly called on for the instant exercise of decision, coolness, knowledge, and ingenuity, to save a person from the most imminent peril of death. You know that the narrowest part of that division of the alimentary canal belonging to the head and neck is the junction of the pharynx and œsophagus with each other, and here it is that a piece of meat or other substance attempted to be swallowed, most frequently stops. Now, when you consider the anatomical relations of this spot, it will be impossible for you to coincide in opinion with those who say that all the distress and danger arising from the stoppage of a piece of solid food here, is owing to its mechanical pressure acting on the trachea behind, where its rings are deficient, and so obstructing the air passing

through it. Why, if pressure could obstruct the area of the trachea at any part in this manner, the place where the body is stopped is just the very one, of all others, where it could not possibly do it, for it lies behind the circoïd cartilage, a perfect ring, presenting a large surface to the obstructed body, and of such strength, from its shape and material, that the whole larynx would be protruded forwards, almost to any extent, before it could be crushed flat so as to obliterate the passage of air through it. That the suffocation from such an accident could not be owing to mechanical pressure is capable of other proof; for the convulsive breathing caused by bodies arrested in the œsophagus, will cease for a little time, during which the patient can breathe comparatively free, and it will return again. Now, this could not be the case if the obstruction was mechanical—such should be permanent. What, then, is the cause? It is a spasm of the muscles of the glottis, induced by the irritation of the foreign body in the gullet.* The term *angina* simply means any inflammation in the neighbourhood of the throat. In *Angina Tonsillaris*

* I have seen a direct proof of spasm being capable of bringing a person to the point of death. A woman was brought to the hospital gasping in a most frightful manner. Having depressed her tongue, I saw a slight herring bone with its spinal end sticking in a follicle of the left tonsil, and its curved point bending to within a line of the rima glottidis. I tried to seize it with a dressing forceps, but at the moment she made an exertion to swallow, the bone touched the glottis, and then came on the convulsive efforts to respire. On extracting the herring bone this went off, but for several minutes she felt as if it had not been extracted, and she said she even felt it in her throat with the tip of her finger thrust down her mouth. It might have been the corner of the os hyoides she felt, perhaps.—*Ed. of Lect.*

the operation of bronchotomy may be required, if both tonsils are engaged, before suppuration has taken place ; but this is very rarely the case—in fact I never saw such a case where the operation was absolutely required. If the distress is caused by a quantity of matter in the tonsils, all you have to do is to give exit to the matter and the patient gets instant relief.

You must not consider the opening of a large collection of matter in the tonsil (and they are sometimes very large) so trifling an affair as if it was a common superficial abscess elsewhere. If you incautiously thrust the point of a lancet or bistoury into one of those abscesses of the tonsil the patient might be suffocated by the sudden gush of the matter into the larynx. You should always open them, therefore, with a trocar, such as this, which is constructed for the purpose. Now, there is some danger of wounding the carotid artery in the introduction of the trocar, if its point be turned outwards. You will therefore pass it in directly from before backwards, and push it on no further than is absolutely necessary to clear the opening of its canula from the anterior wall of the abscess. If, on the instant of withdrawing the stilet, you apply your thumb on the orifice of the canula, so as to prevent the immediate escape of the matter, you can then push it as far as you may think useful without any danger.

There is a case which sometimes requires bronchotomy. It is this :—A patient comes to you and complains of a sore throat and great difficulty of breathing ; you examine his throat, and you see the tonsils in a natural state, as is likewise the velum palati, but look at the back of the pharynx, and you see its lining membrane protruded forwards. If you put in your finger and press on this you feel a softness, a want of

resistance in the tumour—this is an abscess of the pharynx. Now, I have seen an abscess of this kind so large as to hold a quart of matter ; I opened it with a lancet, and, although the patient was leaning forward, he was nearly suffocated with the sudden gush of matter. Such an abscess as this I would recommend you always to open with a flat trocar.

In other cases, there appears to me a better operation than opening the trachea, and that is to get a common gum catheter—cut off the end, leaving the eyes of the instrument on it, and introducing this through the nares into the larynx. There is no difficulty in doing this where we can get it through the nose, but there are some people who could not bear the instrument to be passed through the nose, and in such we must pass it through the mouth. Now, the great difficulty is to know whether the instrument has really entered the larynx or the œsophagus ; you are told that you know this at once by finding whether air comes through the instrument or not—but air may come from the stomach as well as from the lungs. The way to know it beyond all doubt is, that if it has entered the larynx there will be a frightful convulsive cough and gasping at the moment of its entrance—you would really think the patient would die on the instant—but rest a few seconds, and this will gradually lessen, and at last subside, and the patient will afterwards bear the catheter, although with considerable distress ; unless you pass the instrument through the nose, you can hardly, even with this test, be *quite* certain that it is in the larynx. Now, it will sometimes happen that after the catheter has been in the larynx for five or six hours—no matter whether it has been passed through the nose or mouth, that the patient's breathing becomes as bad as ever—we naturally think

the instrument is obstructed, and take it out to clean it of the mucus collected in it, and sometimes you will be right in your supposition ; but sometimes, and it is a remarkable fact, you will find no mucus or other obstruction in it at all. I have not been able to satisfy myself as to what the cause of this may be. In introducing a catheter into the larynx, whether to allow the patient to breathe in such cases as I have spoken of, or for the purpose of inflating the lungs in persons apparently drowned, for instance, but particularly in the latter case, you will materially assist the furtherance of your object by pressing back the cricoid cartilage rather firmly against the bodies of the cervical vertebræ, because by this manœuvre you close the orifice of the œsophagus ; you will also draw forward the tongue, which will leave an uninterrupted and more direct course for your instrument into the larynx. If you require to pass a tube down through the œsophagus you will do the reverse of this—namely, to make the patient keep his tongue back, or if he be unable, in his agitation, to comprehend you, to press it gently back yourself, by which the epiglottis and root of the tongue will protect the larynx, and make the road to the œsophagus more direct.

In angina laryngea we cannot attempt to relieve the patient by the catheter, because the instrument should be applied to a part in a state of high inflammation. This disease has been divided by the French surgeons into two kinds—viz., the inflammatory and the œdematous, but there is no good reason for such a distinction, for in every case there is a watery fluid between the cartilages of the larynx and their mucous membrane, and which sometimes accumulates to such an extent as to close up the glottis ; here you have nothing for it but to perform bronchotomy. There

are two situations where the air tube is opened, one between the thyroid and cricoid cartilages, and the other below the transverse slip of the thyroid gland, the usual seat of which is in front of the two or three first rings of the trachea. We do not operate in those two situations indifferently; should we have to operate in a case of laryngitis, it would be better not to operate high up, because we should be too near the seat of the inflammation; but when the case requiring the operation is not one of acute inflammation, the easiest and safest place is in the crico-thyroid space. The operation is also sometimes required where foreign bodies get into the trachea. A man, suppose, is eating plums, and one of the stones gets somewhere, and causes violent convulsive breathing and cough. Now, I defy the surgeon to tell whether it is in the trachea or œsophagus. Formerly it was the custom, when a bit went the wrong way, and caused the symptoms of choking, for the surgeon to thrust a probang into the œsophagus directly, to push the morsel into the stomach; and certainly it would do so if the morsel was in the œsophagus; but, as I remarked, you cannot tell where it is. Now, can the use of the probang do mischief? It can, for if the foreign body be in the trachea, the instrument, in its passage to the stomach, will push it farther down into the trachea, and thus render the case much worse. When a child swallows a marble or cherry-stone the breathing becomes suddenly convulsive and difficult in a violent degree—the child can point out to you the exact spot it stops in—he makes violent efforts to tear open the parts about the throat and neck, and in a few seconds he may die, or he may live for half an hour. In some cases, after five or ten minutes, one in those circumstances breathes more freely, and this relief may last

for half a day. I recollect being called in to a child in this state; he had what children call a pop-gun made of a quill, with which he used to shoot pellets of raw potato; he had this quill in his mouth, something made him laugh, and down went the quill into the trachea. When I arrived, however, the difficulty of breathing had almost ceased, and the child's mother, a thrifty Scotchwoman, would have nothing to do with the doctor, as the child was better; however, all the bad symptoms returned, and again subsided—something excited the child to laugh, and out popped the quill; and, what was remarkable, the bit of raw potato which was in it when it went down, was not in it when it came up.

Foreign bodies getting into the larynx or trachea may cause instant death, or death after some interval, or they may cause death in a secondary way, as by inducing phthisis. Though the patient may appear to be tolerably easy with the foreign body in the trachea, we must operate, for if we leave it there, phthisis will be the result. It causes an abscess in the bronchus, or the inflammation extends itself to the lung, and causes the disease. Another case where bronchotomy may be required is where a child swallows boiling water, which will cause such thickening of the parts as to entirely impede the passage of the air into the lungs. There is another case which may also require the operation, and which is often connected with an old venereal ulcer of the throat—it extends to one of the arytenoid cartilages: this becomes detached in part, and, falling down over the rima glottidis, may cause death in a few seconds by acting like a valve, and preventing the entrance of air. Here is a specimen where a venereal ulcer entirely destroyed the epiglottis, and you perceive the

rima so thickened and circular, that if you did not see the tongue, you could never suppose it to be the opening of the larynx. This case may also require bronchotomy. Chronic laryngitis may also require it, but after you have performed it, what do you gain by it? Very little; for the long-continued dyspnœa has already produced disease of the lungs, and, therefore, the operation seldom succeeds. I should have mentioned, that when a child has swallowed boiling water, and that this thickening follows, the child has just the voice and cough of one in croup. I was one evening sitting after dinner, and I believe it was Mr. Todd who was sitting with me, when a child was brought into my hall who had met this accident, and when we heard it, we both said—"This is a case of croup." We operated on this little child, which had swallowed boiling water, but it died in about a week after; indeed, the operation seldom succeeds here. *Croup* is a disease that seizes a child very suddenly. He goes to bed quite well; awakens with all the symptoms of croup, and perhaps in half an hour they appear to go entirely away, and he goes to sleep again, breathing quite freely. Unfortunately, this remission of the symptoms, or apparent subsidence of the disease, too often causes a loss of time—that time which is here so precious, and the little patient is carried off in from two to four days. Bronchotomy is of no use in croup, as the inflammation is not merely in the larynx or trachea, but extends over the whole mucous membrane of the lungs. Sometimes as a person is just going to swallow a mouthful, he will fall down and expire, and is said to be choked; but the œsophagus may be found quite pervious, and the cause of death may turn out a disease of the heart or an internal aneurism.

LECTURE XIII.

TRACHEOTOMY—INFLAMMATION OF GLANDS ABOUT
THE NECK—GLOSSITIS. POLYPUS. WOUNDS OF THE
THORAX.

WHEN the operation of tracheotomy is to be performed, you will find things in a different condition from what you might suppose from performing it on the dead subject. It is all very well to say, throw the head back and give yourself room; but you cannot put your patient into the position you would wish, on account of the difficulty of breathing—it is so great that he cannot bear such a position an instant, and that in which you find him is generally a bad one, for he is leaning forwards; and you must put up with the inconvenience. The way to perform the operation in the upper part of the neck is this:—Take hold of the thyroid cartilage between your finger and thumb, and make a perpendicular incision with a scalpel through the integuments, down to the cricoid cartilage, and then make a transverse cut between the thyroid and cricoid cartilages through the membrane connecting them. Here the parts you operate on are superficial, and no part of consequence comes in the way of your knife. There is sometimes a little artery running transversely on the crico-thyroid membrane, but even if it should be present, and be wounded, it will give little trouble. A trocar has been recommended to be used in making the opening between the cartilages, but it is a bad instrument for the purpose, as you

might transfix the larynx with it, or wound its back part; besides, the canula of such an instrument would be a very inconvenient one to leave in the wound, if you thought such a proceeding advisable. I think any canula generally unnecessary in these cases. The moment you put in a canula it is shot from the wound to the other end of the room, and besides, it irritates, although a curved one does so less than a straight one. There is no necessity for a double canula at all, for when you want to clean it, there is no difficulty in removing or replacing it. In operating on the trachea below the thyroid gland in chronic cases, the parts are all so thickened that it is sometimes difficult to find the trachea. I have seen surgeons looking for it before they got between the sterno-hyoid and thyroid muscles, which will be found in such a case much enlarged in size: a trocar in this latter kind of case is a very dangerous instrument; for it may slip off the trachea, or the trachea may slip from under it, and the instrument be plunged into some of the arteries at the side of the neck. You might make the incision into the trachea with the same knife with which you make the external incision. You should make your division of the integuments long, so as to give you plenty of room, and don't let your assistant draw the lips of the wound asunder, but do it yourself, lest you lose the proper line of your incision, which would embarrass very much the subsequent stages of the operation. You must generally divide some of the veins which lie in front of the trachea, and here you are advised to suspend your proceedings until the blood stops, lest it should get into the trachea, even for two or three hours—but this is not necessary. Just get an assistant, (and you should take care to provide yourself with an intelligent one for the pur-

pose) and let him draw the lips of the wound asunder with a straight or curved spatula, or put in a dossil of lint on the side the bleeding comes from, and go on with the operation. The trachea lies so loosely connected, that a very slight pressure can move it from side to side, so that before you attempt to open it you must hold it fixed in its place with the finger and thumb of the left hand, while you make your puncture or incision through its rings with the right. You know how closely the carotid artery and jugular vein lie to the side of the trachea, and if your knife slipped off its convexity, it might readily wound one of these vessels: the consequence of such an accident I need not mention. When you have opened the trachea, if you think it necessary, just introduce a quill into the opening, and this will generally be enough. If the operation is required in consequence of a foreign body being in the trachea, it generally happens that the moment this tube is opened the substance that got into it is thrown into the mouth. I don't know how this happens, but so it is.

Dessault tells you that the foreign body sometimes gets into the ventricles of the larynx, and in such a case he advises you to proceed in the ordinary manner until you come down to the crico-thyroid membrane, through which you make a transverse incision; into this you introduce a director, and pass it upwards through the rima glottidis; guided by this, you pass up a strong probe-pointed bistoury and divide the thyroid cartilage in the line of junction of its alæ. He says that if the thyroid cartilage be converted into bone, which you know is not unfrequently the case at or after the middle periods of life, that still the knife will find but little difficulty in cutting through it. You recollect that these little sacs, the

ventricles, lie at each side of the larynx, with their openings looking towards each other, that they are situated above the chordæ vocales, and that the anterior extremities of these ligaments are attached to the thyroid cartilage, so close to each other that it is not an easy matter to pass a knife through the cartilage without wounding one of them, and that it is not in any case a very easy matter to be satisfied beforehand that the foreign body be in those cavities at all; it must be a very small body, in fact, that could lie in them, for a small garden pea could hardly fit in one of them. All I can say of this operation is, that I never saw a case where it was necessary to perform it.

Inflammation of Glands about the Neck.—The SALIVARY GLANDS are not very subject to disease. They occasionally form calculous concretions, and are sometimes the seat of scirrhus, but acute inflammation and abscess are very rare, although collections of matter, and large ones too, are often formed in their immediate neighbourhood. A person will get an ear-ache, which will, in a little time, become a violent pain, attended with high inflammatory fever, the part will become very red, which will, in some cases, extend over the whole side of the neck down to the chest. After some days of intense suffering, a little matter will appear in the external auditory canal, and some will be discharged for a few days, but with very trifling relief. Now, although this begins in the parotid region, the parotid gland itself has nothing to do with it. It is inflammation and suppuration of some of the lymphatic glands on its surface, between it and a dense fibrous membrane covering its outer surface; this fascia binds the inflamed gland down, prevents the matter coming to the surface,

forces it to extend itself down the neck, and, at last, the pent-up fluid makes its escape, by little and little, through some of the deficiencies in the cartilaginous portion of the external auditory canal lying behind the parotid gland. But this mode of discharge gives very little relief to the patient, and does little or no service. Although you cannot feel any fluctuation at the place the matter first forms, in general, yet you can have no doubt of its presence, and you should without delay, give free exit to it, and if the disease had remained unrelieved by your operation for any time, a very considerable quantity will be let out, and the patient be relieved. I need say nothing about the operation for removal of the parotid gland, for if you consider its anatomical relations you will be convinced that its removal is quite beyond the power of surgery; but in the cases given us of its removal, I believe the matter to have been simply this—that one of those lymphatic glands had been the subject of chronic enlargement; by its pressure it at length caused absorption of the parotid to a great extent, and the removal of this enlarged lymphatic was mistaken for that of the parotid itself. The enlarged gland would not of course present the same difficulties in its removal as the parotid would, for no matter what changes of form or size it might undergo, it would not have the important vessels and nerves running through its substance that the parotid gland must have.

The TONGUE is sometimes inflamed, and when this is the case, the swelling of the organ is so great as greatly to impede respiration and to prevent deglutition. You might, on seeing a case of this kind, think that a necessity existed, or was threatened, for the operation of bronchotomy; but this is hardly ever the case. All you have to do is to make two or three

deep incisions into the substance of the tongue, and the swelling will subside in a few hours.

POLYPUS.

THE disease called Polypus may be considered as belonging particularly to mucous membranes, and is generally connected with the lining of the nose or uterus, although occasionally met with in other situations. Polypus occurs in two states or under two forms, one called the *benign*, the other the *malignant*. The first gives little trouble but from its size, and the consequences to the neighbouring parts from its increasing volume; the second is often painful, and distressing from the beginning, more than its mere size could account for. What would lead you to think that a man is breeding a polypus of his nose even before there is any external indication of its presence? Why, he will tell you that he has had a cold in his head for some time—that he feels as if there was something stopping it up, and uses his handkerchief incessantly—that there is some discharge from it, but that, as he experienced no pain, he hardly thought it worth his while to apply for advice; but that its continuance, notwithstanding the use of medicine which he had several times taken, and lately the seeming enlargement of one side of his nose had alarmed him a little. If you question him, he will tell you that he is worse at one time than another—that he thinks he is worse in a warm room and in damp weather than at other times, and that lately he can hardly breathe at all through his nose when he gets into bed. You clearly see one side of his nose swollen, the swelling being larger in the middle—not being so wide where the edges of the nasal bones are, nor at the nostrils. When you come to make an examination of the parts,

you find a greyish soft swelling filling up the side of the nose; if you press it with a forceps, it gives no pain, but increases the quantity of watery discharge that comes from it. Although you do not detect more than one swelling, there may, in fact, be two, or three, or more distinct polypi existing at the same time. The presence of this kind of polypus, then, may be suspected before there appears any deformity, and some of them have remained without much increase or disturbance during the patient's life. Now, the malignant polypus of the nose is accompanied from the commencement with pain in the nose, forehead, and general headache. It is not affected by change of weather or other circumstances that influence the mild form of the disease—it is not soft or greyish, but has a peculiarly firm consistence, and of a liver colour; when you press on it pain is felt, and some blood will be discharged. This polypus may go on slowly increasing for years until it ends in a cancerous or fungous disease, and produces a frightful destruction of all the neighbouring parts. Long before this, however, the skin over it assumes the liver colour of the polypus itself; in some of these cases there will be small bleedings from the nose from the beginning, and the bleeding will be increased by touching it. Treat this malignant form as you will, it will never become mild—it will not change its character for that of the simple kind I first mentioned, and so far is any interference or meddling with it likely to do service, that it only hurries it on to its worst form. I saw one case where the patient died in twenty-four hours after an attempt had been made to extract a malignant polypus. Notwithstanding the opinion of John Bell and Richter, I am decidedly of opinion they should not be meddled with.

Now, is there anything might be confounded with a polypus of the nose? An abscess sometimes forms in the nose, which, by its enlargement, simulates the first symptoms of polypus, and when you examine the parts you see the nostril filled up; when you are able to detect the part of the nostril to which this swelling is connected (which is generally the case) you find it attached to the septum. Now, this is a place where polypi are never found, as far as my experience goes, and this fact will at once decide the question. In many cases of those abscesses at the septum nasi, there will be found one also in the other nostril, just at the other side of the septum. A simple relaxation of the mucous membrane proceeding from the lower spongy bone, is said sometimes to resemble a polypus, and the difficulty of distinction arises chiefly from the fact, that the root or attachment of a polypus can scarcely ever be discovered by the eye, or satisfactorily even by touch with the finger or instruments—it is generally high up, and may be at the most posterior part of the cavity. Now, suppose, a boy of thirteen or fourteen years of age, comes to you and complains of most of these symptoms accompanying the early progress of a polypus, that there is a tumour there, which bleeds frequently, with or without apparent cause, and attended with pain—may this be anything besides polypus? It may be fungus hæmatodes, and I believe it is as frequent an occurrence as malignant polypus itself. Well, look at this boy's countenance—instead of the brownish appearance of the side of the nose, and the pallid appearance in the face generally, which will result from the nature of the polypus and its frequent hæmorrhages, you will have some appearance of enlarged cutaneous veins near the seat of the disease, and that yellowish hue of skin which attends

fungus hæmatodes, and which is very different from the look of one that has merely suffered from simple loss of blood. Although in the last stage of polypus you will, some little time before death, find the patient falling into a comatose state, this condition will generally be earlier and more decided in the fungus hæmatodes, which has probably caused removal of part of the ethmoid bone, has made its way into the cavity of the cranium, and is probably connected with disease of the brain itself; it will also sometimes make its way into the antrum and thence into the orbit and protrude the eye. You can do nothing for the fungus hæmatodes of the nose at all. A secondary venereal affection of the nose might be sometimes confounded with polypus, it is said, but the excessively fœtid discharge, and the continual annoyance of the formation and discharge of crusts in the former case, with the previous history, and careful examination of the nose, will sufficiently distinguish one from the other. A polypus, instead of coming forward towards the opening of the nostril, may go backward into the pharynx. It may arise from the top or side of the nostril so close to the posterior opening that, as it increases, it finds it easier to project into the larger cavity than into the smaller; or it may arise originally from some part of the roof of the pharynx—but in either case its presence will not be suspected from the same train of symptoms which marked it in the nose. The patient's distress in this case will be particularly in the act of deglutition, and when much enlarged it may interfere with respiration or even threaten suffocation, although not in the same way as it would in the nasal polypus.

The polypus which has its seat in the nose will often, on the increase of its volume, press on the nasal opening of the lachrymal sac, and so interrupt the passage

of the tears, which will then flow over the cheek as it would in obstructions of the duct from other causes ; this will not take place when the disease is in the pharynx ; but when situated here it may cause deafness or ear-ache, by its pressure on the pharyngeal opening of the Eustachian tube. When you look into the mouth, if the polypus has not descended below the edge of the velum, you will not of course be able to see it, but you can observe that the velum itself is pushed forwards ; if it is visible, it will in general appear of a globular shape and dark colour.

How are you to treat a polypus in the nose ? There is sometimes considerable difficulty in employing the best method—namely, extraction, on account of the size of the tumour and consequent want of sufficient room for the instrument—it is also occasionally found so soft in its texture and so easily torn, that the forceps only tears it away in bits, by which the patient is subjected now and then to considerable loss of blood. On this account various caustics have been tried for its removal by ulceration or sloughing—or the actual cautery, and astringent injections. I know of no well authenticated case of success from those proceedings. When the polypus was very little vascular it has been recommended to remove it with the knife, but this proceeding has no peculiar advantages. Pressure on the polypus could effect nothing on account of the difficulty of applying it and the irregularity of the cavity, even if it could give rational hopes of success under any circumstances.

There are but two methods therefore that have maintained any ground with practical surgeons for the cure of polypus—namely, its removal by ligature or by the forceps. It is often very difficult to pass a ligature of catgut or other soft materials through the

nose, in consequence their not being able to overcome the least resistance, particularly when moistened by the mucus of the cavity in their passage ; to remedy this inconvenience, a metallic wire has been used, but even this has its disadvantage, for it is apt to break when its ends are being fastened by the necessary twisting.

When a small polypus has its attachment very far back in the nose, or even, as you would say, in the pharynx, you will sometimes be able to reach it through the nostrils, by making the patient expire strongly through one nostril while he compresses the other, but if the disease becomes long, this will not be possible. If, on your first trial of the extraction, you find the polypus extremely soft in its texture, it would be better to wait a little than to persevere, for it is often so in the very early stage, and will in such a condition present the difficulties I before mentioned to the grasp of the forceps, will be too easily torn to allow the twisting and pulling or drawing down, that may be required to disengage its root—and you will find some of those that will require a good deal of force—while, by waiting a month or two, it may become sufficiently firm for your purpose, and in three or four trials you may take it away. You should choose wet weather for the operation, if there seems any likelihood of your getting your choice—but it is a matter of no very great consequence. Having seated the patient opposite to a window, that you may see what you are doing, or what you may have to do, you make him expire strongly and introduce the polypus forceps a little open, to the highest point, and grasp the polypus as near its attachment as you can ; you next twist the instrument round and round slowly, drawing it steadily downwards, but not too strongly ;

in a little time you feel that the resistance gives way and the polypus comes out. Generally, at this moment, there comes a hæmorrhage more or less considerable, and sometimes it even seems alarming, but do not suffer yourself to be confused by the occurrence, but introduce your finger at once, try if you can feel any of the disease remaining, and if you do, re-introduce the forceps and remove it; this done, the bleeding may stop spontaneously in a few minutes. Your finger may discover one or more smaller polypi remaining after you have extracted the first, and if you can, it will be advisable to remove all you can at once, but very often you will have to repeat the operation the next day or the day following for polypi left behind after the first extraction. Should the bleeding continue to a greater extent than may be desirable, you must pass up some dry lint, or moistened with a little oil of turpentine, as high as you can into the nose, and then some more until the nostril is filled, and if this should not succeed to your wish it may become necessary to plug up the nostril more firmly both in front and behind. If the polypus hangs in the pharynx, you pass in the ligature or wire through the nose, by means of a canula; you then push the ligature along the tube until it becomes visible in the mouth, lying between the velum and the polypus, you push the lower part of its loop backwards behind the tumour and then tighten the nooze. Now, there is no little importance to be attached to the *degree* of constriction you make. If it is not sufficient, the *return* only of the blood from the polypus is interrupted, it will increase very much in size rapidly, it may inflame and have to go through the whole process of inflammation, until it sloughs at length away; but if it had been large before the operation, all

this may be in the highest degree distressing or dangerous, by impeding or stopping altogether the entrance of air into the lungs; whereas if the supply of blood be obstructed in the polypus by a sufficiently tight constriction, it will not increase, or inflame, but hourly grow less, until it ultimately falls off in two days, or even in less than that time sometimes. You will, however, avoid the risk of cutting through the polypus with the ligature, which might cause a discharge of blood, not always easily checked in this situation. Should the polypus not have come away about the second day, the ligature should be again tightened. Treat polypus as you will, it will be liable to return, particularly in the nose or pharynx. It does not seem to relapse so frequently elsewhere, as, for instance, in the uterus.

WOUNDS OF THE THORAX.

WE shall now proceed to consider *Wounds of the Thorax*. They are divided into those which engage only the parietes—those which penetrate the cavity, and those which, having penetrated, wound the viscera contained in it. They are also divided into simple incised, lacerated, punctured, &c. As to incised wounds of the parietes of the chest, they differ but little from similar wounds elsewhere; for although they may have symptoms occasionally somewhat different, according to the parts injured, yet being a fair open cut, where one can see fully the extent of the mischief done, they cause the surgeon no particular alarm or trouble. In treating these wounds you will look carefully to the position of the arms, &c., so that the soft parts shall be as easy as possible, and that no motion be allowed in parts that might have a tendency

to separate the lips of the wound, or in any way disturb the dressings, and this can generally be fully accomplished by the judicious application of compresses and bandages. Now, punctured wounds of the chest, not penetrating its cavity, are often puzzling enough, from their simulating those which have gone through the parietes, and into the cavity of the pleura, and from the extreme difficulty of tracing their course in some cases. You cannot determine anything from an inspection of the instrument that inflicted it—from the account you receive of the position the patient was in when struck, or from the symptoms which present themselves to you if the viscera be not wounded. If the man has been stabbed with an elastic sword obliquely, it may glance round the ribs for some distance, leading to the notion that the wound is one of great *depth*, when it is quite superficial, and only one of greater or less extent. The soft parts engaged in the wound collapse and fall together when the weapon is withdrawn, and a probe will never be able to follow the track of the wound; the skin, also, contracts so much, that you are astonished that so large a weapon could make so small a wound.

You are told that if the cavity be wounded, there will be great distress of breathing, the patient will have an extremely agitated and anxious countenance, his pulse will be very weak and faltering, his face pale, &c.; but you must place no reliance at all on these symptoms, for even the bravest man on getting a flesh wound in the thorax will have every one of them—every symptom that attends the opening of one of the great cavities will present itself, although the cavity is not opened at all.

One or two muscular branches of arteries, which

are pretty large and numerous about the walls of the chest, may have been wounded, and a good deal of bleeding come from the wound in consequence ; besides, the effect of the shock on the patient's respiration, the weapon may have wounded some of the nerves distributed to the muscles on the parietes, that are intimately connected with this function, or the muscles themselves, and of course this will render the breathing hurried and difficult. How, then, do you escape those difficulties ? What you are to do with the case is this—Keep your patient quiet, tranquillize his mind, and as soon as the first agitation is over, bleed him. You must not place any reliance on purgative medicines—they are not at all useful—they are even injurious, by making the man exert himself in getting up often out of bed. Some of the arteries at the side of the chest, in the loose cellular membrane near the axilla, may be wounded, and cause tumour there ; make an opening and let it out, and introduce a dossil of lint into the wound you have made. There is only this difference in the consequences of a simple parietal wound and one penetrating into the thorax without injuring its viscera, that inflammation of the pleura or lung is more likely to follow the latter than the former ; but your treatment will not differ much in the two cases.

An incised wound may be made with a sabre, between the ribs or at right angles with them, or even cut one or two of them quite through, and in either case enter the cavity of the chest, and this may happen without any wound of the lung. Now, what do you see in this case ? Why, you will see sometimes a portion of the edge of the lung thrust out of the wound at each expiration ; the chest being compressed during that act forces out the lung. If, in forty-

eight hours after the injury, you see the patient with this protrusion of the lung, what are you to do? If you let it alone it will be united to the edge of the wound by the adhesive inflammation.* It will be constricted by what might be called this natural ligature, and it afterwards sloughs off without any injury to the constitution. Adhesive plaster will not do to keep the lung from protruding in this manner, and if you see the case before adhesions have taken place, what you are to do is this—take a curved needle with a ligature and introduce the point within the wound, taking care to prevent its injuring the lung, bring it through the edge of the wound from within outwards, keeping your fingers between it and the protruding lung: when you have thus made two or three stitches of the interrupted suture, get as many assistants as there are stitches, and let each take the ends of one ligature, having put a single knot on each—then watch your opportunity for the lung to retire in inspiration, and

* In one of these case which I had to watch closely for several hours in hospital when a pupil the protrusion appeared to be caused in this way—The patient inspired with great rapidity—a convulsive gasp, like—he then closed the glottis, and retained the air as long as he could, keeping the expiratory muscles strongly in action, but without letting any air escape, as if, it seemed to me, to press the contained air forcibly against the sides of the air-cells. At this time the lung protruded through the open direct wound between the ribs. As the lung on the wounded side must have been very imperfectly inflated by the act of inspiration, considering the size and direct course of the parietal wound, the pressure on the lung on the sound side, through the abdominal muscles, must have forced some of its air to return by its bronchus, into the opposite one, the only place it could go to, the glottis being closed, and so, as it were, blow out the lung where there was nothing to resist its distension.—*Ed. of Lect.*

instantly let all the ligatures be drawn tight ; nothing but suture will do to keep in the protruding lung. I saw a case of this kind caused by a gunshot wound, and although ligatures were not used in gunshot wounds in general, they were applied here, and the patient certainly died easier than he would if the wound had not been meddled with.

LECTURE XIV.

WOUNDS OF THE THORAX, CONTINUED—WOUND OF LUNG—AXILLARY ABSCESS—WOUNDED INTERCOSTAL ARTERY—GUNSHOT WOUNDS OF CHEST.

SUPPOSE the lung itself is wounded, how are you to know that it is so? We are told that the patient will spit up a quantity of frothy blood—that frothy blood will come from the wound—and that there will be that failing of the pulse, and general sinking which always attends wounds of the large cavities; that if we hold a lighted candle to the wound, its flame will be affected by the air rushing out from the wound in the lung. Certainly, if after a wound of the chest, we see blood coming up and discharged by the mouth, we have the best reason to believe the lung to be wounded, nor would it be extraordinary if the blood should have air mixed with it, but you need not much rely on blood, whether frothy or not, coming from the external wound in the side, for there may be this symptom without any wound in the lung; the fainting and sinking of the pulse will happen in any wound in the chest, and generally from a large wound any where. Now, as to the test of the lighted candle, of what value is that to you? Of not the least,—for in any penetrating wound of the thorax, air will go in and out of the external wound as well as the larynx, and the candle will show this whether the lung be wounded or not. In fact, there is no *one* symptom given of wounded lung, infallible—even the bloody expectoration. Our prognosis should at first be very guarded always, because these symptoms look as if they arose

from profuse hæmorrhage, although it does not follow that the patient must die; nor should we allow ourselves to be too confident of ultimate recovery, because the blood has ceased to come up. There are a great many ways by which such a case may become fatal, besides from loss of blood. This, it is true, will sometimes cause death suddenly, as by filling up the trachea, and preventing the access of air; or in a few minutes, or in half an hour, by getting into and obstructing the branches of the bronchi, or filling up the air cells or the cellular membrane of the lungs; or, at a more or less distant period, by causing phthisis, if the constitution is disposed to that disease.

One of the consequences of a punctured wound in the parietes of the chest, is the formation of an abscess under the pectoral muscle. Abscess in this situation does, not unfrequently, occur without any injury of the chest whatever, and would not claim any particular attention but from the course it often takes towards and into the axilla. When the matter gets into this space it involves some practical considerations that demand special notice. Now, matter may either form in the axilla itself, as it would in any other situation, or it may get there from other sources. It may, as I said, come from the side of the chest in consequence of a parietal wound: it may make its way from some neighbouring part of the spinal column from diseased vertebræ: it may come up from the arm, or forearm, or even the hand, in consequence of whitlow or abscess in the extremity from any cause whatever; but whether formed originally in the cavity or getting into it from other sources, it will accumulate largely before you can well satisfy yourself that it is an abscess at all. The walls of the axilla are formed behind by the scapula and subscapular muscle;

in front, by the pectoral muscles ; internally, by the ribs, intercostal, and serratus muscles ; and externally by the humerus ; below it is closed up by a fascia which, under circumstances such as we are considering, becomes of considerable strength. The cavity thus formed contains a quantity of peculiarly loose reticular cellular substance, and many lymphatic glands, besides the axillary artery and numerous minor ones, and many large and small nerves. Now, matter in this cavity will increase to a large size before it makes any great show, because of its unyielding parietes and very yielding contents, and for the very same reason an aneurism here will attain a considerable size before it meets much attention from the patient. You will in either case have no well-defined swelling, or no very apparent swelling at all for a long time ; there may be pulsation in what *does* appear at the opening of the axilla below, be the case aneurism or abscess, or there may be no pulsation to be felt by the most careful examiner. The numbness, prickings, or pain in the extremity, or œdema of the limb, arising, as they do, from the simple pressure on the nerves and absorbents, will all be common to the two cases, as also the diminished volume of the pulse at the wrist in the affected side. I must defer any remarks on the case of the axillary aneurism, until the diseases and injuries of arteries come properly before you ; but in the case of abscess the patient will be unable to use his limb—the elbow will be pushed out from the ribs, and the patient leans to that side to maintain this separation of the arm from the chest, at the least expense of pressure on the parts in the axilla. Well, at length after perhaps a good deal of suffering, or at least after a lengthened deprivation of the use of the limb, the collection of matter makes

its way out through the lower opening of the axilla, or a puncture is made into it with a lancet, a great deal of matter escapes, and the symptoms connected with the member speedily subside. But how do things go on after this? Why, the discharge diminishes daily, until at length a very trifling quantity comes away in the twenty-four hours; but it also begins to alter in quality—it becomes thin, and the opening, or openings from which this gleety matter is discharged, show no disposition to heal; they become fistulous. When speaking of acute abscesses in general, I mentioned that an important part of their treatment, when their contents are evacuated, is the employment of compression to keep the walls of the abscess in contact, so as to induce them to unite. Now, how is that plan to be adopted in the case of axillary abscess? It has been advised to put a globular compress against the lower wall of the axilla, and to keep it pressed up towards the cavity by bandages, or even a spring, after the manner of a truss. Such a contrivance can have very little effect on the general cavity which it is wished to diminish, on account of its shape and extent, and it has these disadvantages, that it keeps the arm from the side and the pectoral muscle from the chest; and, moreover, necessarily prevents the escape of the discharge by pressing on the openings through which alone it could come. A much better plan is to place your compress over the pectoral muscle, and to keep the arm bound to the side by a roller.*

* From anatomical observations, it appears that the mode of diminishing the cavity of the axilla to the smallest possible size would be this—Push back the shoulder as far as possible, and depress it a little—this will bring the concave surface of the scapula (or rather the muscle

For the treatment of the fistulæ when they establish themselves, the usual methods may be had recourse to—viz., opening them freely with the knife, or injecting them with some stimulating or astringent fluid. From the great importance of the parts occupying the axilla, and the perilous chances of cutting here and there among them, the treatment by injection might get a trial at first, but if, after a reasonable time, they seem to be ineffectual, you must employ the knife.

What is the danger with which a patient is menaced whose lung is wounded? When you are called in you cannot know his danger, except, indeed, some of the large vessels at the root of the lung are wounded. The patient cannot breathe unless in the erect position: he is throwing up blood from his mouth in large quantities: it is rather flowing out than being spat out; after a little time this flow of blood gets less and less: but the patient dies, not, as is often supposed, from the loss of blood, but from the blood filling up the trachea and bronchi, and being poured into the interlobular cellular substance of the

filling up that concavity) close upon the convexity of the ribs behind, while it lays down the pectoral muscles flat upon the ribs in front, and the upper part of the humerus is brought as close to the side of the chest as possible; a compress over the pectoral muscle will then complete the diminution of the cavity to the greatest extent that it will admit of. It will be recollected that when the shoulder is carried forwards, it describes a portion of a circle of which the clavicle is the radius, and the sterno-clavicular articulation the centre, and that in the motion of the acromion forwards, the humerus and inferior margin of the scapula quit the convexity of the ribs at a tangent, as it were, and of course enlarge the cavity of the axilla, for the pectorals are drawn away from the chest in front by the same movement.—*Ed. of Lect.*

lungs themselves. If the wound is to end favourably, the quantity of the blood diminishes a little, next comes saliva mixed with blood, and finally, the blood is only discharged at long intervals, and soon stops altogether. But the breathing is not relieved all this time—at least not much. Now, suppose we are called in while this profuse bleeding is coming from the mouth, what are we to do? The very best thing we can do is to make the patient faint, and thereby to cause a coagulation of the blood. Whenever blood is poured into cellular membrane, like that which enters into the composition of the lungs, it always coagulates. Well, we induce this fainting by bleeding, and here the bleeding from the arm must be large in quantity and suddenly drawn. The patient's friends may say—"He has already lost a large quantity of blood, and is still losing it, why therefore would you take more blood from him?" But do not be deterred from your purpose by anything that may be said or hinted, by those who cannot understand your object: there is nothing else to save the patient's life. When you open a vein in one arm, if it does not bleed freely, don't hesitate to open a vein in the other, and you must not be satisfied with a small orifice, for ten ounces of blood, taken away suddenly, will cause fainting, when it would take twenty ounces to produce the same effect if taken slowly. You *save* blood and the patient's strength in proportion to the freedom with which the blood flows from the vein. But suppose you succeed in lessening or stopping the flow of blood from the mouth, may you relax your vigilance? No, indeed, for in five or six hours it may break out afresh, and you should be on the spot to repeat your venesection instantly; it may return several times—in six, ten, or twelve hours, and at

each recurrence you must be ready with the lancet ; even at every new fit of difficulty of respiration you will bleed if possible—anything to avert hæmorrhage from the lungs.

As I before said, although you stop the flow of blood from the mouth, you do not relieve his breathing, nor can you do anything for the dyspnœa but to keep your patient perfectly quiet ; let him not speak a word, but call for everything he may require by signs. Anything that makes a patient in this state exert himself, such as must follow the exhibition of a purgative medicine, will do great mischief. Indeed, purgative medicines in these cases always do harm, even independently of their obliging the patient to use exertion, or of being moved by others, during their operation ; and, as for any good they can do, I believe there may be doubts. You might perhaps order him a diaphoretic medicine, but your great object is to lower the circulation. If your first bleeding fails to stop the hæmorrhage by the mouth, you must repeat it in five or six hours.

With respect to the difficulty of breathing, you are told it proceeds from blood getting into the cavity of the chest and pressing on the injured lung, on the mediastinum, and, through this, on the sound lung, and you are directed to make an incision into the cavity of the chest to get this blood out, if the wound be not large or convenient enough for the purpose. This is all visionary, and I am convinced the men who direct this to be done never practised it themselves ; for what will the surgeon who has drawn his views of the matter from actual practice tell you ? Why, that this effusion of blood into the cavity of the chest is, by its very pressure, of the greatest service, it keeps the lung collapsed and motionless, and these are both essential

to the healing of the wound in it ; nor is the pressure of this blood less useful to the maintenance of respiration in the lung on the uninjured side, by affording resistance to the sound lung, so that the expiratory muscles can effect the compression, necessary to expelling its air, when it requires to be removed. So long as the blood in the cavity of the pleura keeps the lung empty and compressed, so long will the bleeding from the wounded lung be controlled, and hopes may be entertained of its final cessation altogether. But independently of these opinions, what would the practical experience of such proceedings teach ? Why, just this—that if you take your instruments and let this blood out of the cavity in which it lies, your patient instantly drops down dead, as if some large blood-vessel had been opened. But again, we are told that the confined blood may have coagulated, and that being determined to have it out by some means or other, as it will no longer flow out of itself, we are to make our opening between the ribs, and if the blood should not come out in the fluid state, we should take a large syringe and inject a pint of warm milk and water and wash it out ! Why, any patient who could bear a pint of fluid to be injected into his chest, could have been in no danger before the operation. The fact is, you *could not* wash out the coagulum if you were to try. Suppose there were no other grounds of objection against so absurd a practice, would it not be enough to recollect, that a clot of blood is not capable of being dissolved by anything you would dare throw into the chest.

A great deal has been said, and a vast deal of ingenuity has been expended upon the subject of wounds of the intercostal arteries, by surgeons, or rather surgical writers. I know no subject on which so much

has been advanced with, obviously, so little observation from real practice. The fact is, the intercostal arteries can hardly be injured in these wounds of the chest, they are so protected by the ribs; but in cases where one of these arteries has been wounded, it will not bleed into the chest, but outwards—and those who have written from practice tell us that no one ever died of effusion of blood into the chest from a wound of an intercostal artery—and what is quite as true, no one ever died of hæmorrhage from this artery when it bled outwardly.

In gunshot wounds of the thorax there are not the same causes for apprehension as in others; what you have to fear most in injuries of the lungs is hæmorrhage. Now, suppose a musket or pistol ball has gone through the thorax, you will have little bleeding, and why? Because the ball has suffered such a diminution in its velocity by the resistance it met from the parietes, that it only lacerates the soft tissue of the lungs, and by this laceration the bleeding is in a great measure prevented, and therefore it follows that this kind of wound is much less dangerous than a less extensive wound given by a small sword. It is to the loose soft texture of the lungs that this safety is owing, for if the substance of the lung was harder, the ball would *contuse* it instead of lacerating it. From the same cause also comes the remarkable circumstance that we very seldom see sloughing of the lung from gunshot wounds; any sloughing that occurs is in the external parts, which suffer like any other parts from contusion. It is with great astonishment some read of a man whose thorax was transfixcd by the shaft of a gig, which absolutely pinned him to the wall, and had to be drawn back again through his chest, yet the man recovered. Now, I see nothing at all surprising in the

matter, and I doubt very much if there was not less danger in this accident, than if the man was pinned to the wall by a small sword, and for the very same reason as in the case of the gunshot—namely, the laceration it produced. Hæmorrhage is our more immediate source of apprehension from a wounded lung, and lacerated wounds are the least, of all others, inclined to bleed. I do not mean to say that all gunshot wounds of the lungs are absolutely exempt from the dangers of hæmorrhage; if the ball goes through the lung near its root, where the blood-vessels are very large, there may be hæmorrhage, and that even so violent as to cause instant death; I merely intend to say that those wounds are less subject to it, than simple incised or punctured wounds. There is another process that prevents bleeding in gunshot wounds of a lung, it is that lymph is quickly poured into the cellular membrane of the lung which closes up the wound or passage of the ball; if undisturbed this becomes a permanent obliteration of it, and the lung will soon resume its functions. If the surgeon is not too busy with his fingers or probes—too curious to know what will be of little use, the wound in the lung may be united to the external wound, and nothing from the former can fall into the cavity of the pleura.

But although hæmorrhage is less to be apprehended from a gunshot wound in the thorax, yet this kind of wound has dangers peculiar to itself. The ball, for instance, may carry in with it foreign bodies, as pieces of cloth, &c., into the wound, and in three or four days, perhaps, there comes on a purulent expectoration, and a discharge of pus from the wound, or it may come from the wound alone, and this goes on from day to day, and until that foreign body makes its way out, the patient cannot be well; if he happens to have a

tendency to consumption, he inevitably sinks under this. But if he is a strong healthy man the presence of the foreign body will not cause *him* to get phthisis, but the constant irritation will excite a hectic fever, which will disappear on the discharge of the substance that produced it, and the patient gets well. This fact shows strongly the constitutional nature of pulmonary consumption. Well, after the discharge has continued for, perhaps, three or four months, the wound may heal up, but we see things are not exactly as they should be; we see that the discharge from the wound has not ceased gradually, as it ought to have done, previously to the healing of the wound, if every thing was right; we see that his breathing is not better—he gets feverish, restless, and uneasy, and in three or four days the wound may break open again—again it goes on discharging—running the same course as at first, and perhaps heals up again, and again breaks open and discharges as before. Now, what are we to do in this case, to remove the foreign body which keeps up this state of things? The French surgeons tell us we must draw a seton across the chest, and even sometimes fasten bits of linen cloth at intervals on the cord, or tie knots on it, and drag it through the track of the wound. Now, if the track of the wound was as straight as a gun-barrel, there might be something in all this, and if the ball was lying across the canal of the wound; but the fact is, the course of the ball may not be straight, or there is a recess off the canal in which the ball or other foreign body lodges, and of course a seton, passed through the wound, could have no effect whatever in dislodging it from its situation. All you can possibly do for the patient in this case is—to order him into good air, give him good nourishing diet, &c., and wait patiently for the

natural expulsion of the foreign body. When a ball enters the *spine* it is invariably fatal; sometimes by the injury it does to the spinal marrow, and often by the mere irritation of the bony disease.

After a wound in the chest, inflammation of the lungs may come on; how are we to know when this inflammation begins? There is no such thing as a prominent symptom to indicate the commencement of inflammation of the substance of the lungs, after a wound in the thorax; they come on so insidiously that they never will strike the surgeon, unless he is absolutely on the watch for them—unless he is constantly looking out for them, and if he waits until he witnesses a striking symptom, he will have waited too long to afford effectual assistance. You know your patient has been suffering for some time, from difficulty of breathing, more or less pain in the side, and some degree of feverish disturbance. Now, in this state the chances are fifty to one that the first symptoms of inflammation of the substance of the lungs are unnoticed, not only by the surgeon in attendance, but by the patient himself; for even in cases where there is little to distract the attention, as where pneumonia comes on from cold, the first symptoms are so obscure, are accompanied by so few well-marked inflammatory symptoms, and are attended by such trifling distress, comparatively, that some days may elapse before the fact develops itself satisfactorily.

If, after the third day, the patient complains to you, or that you find on inquiry, that he has a pain in some particular part of the thorax, which he is generally able to point out with his finger—this pain, not a continuous one, but occurring particularly during inspiration—if he has an irritative cough—you will lay

your hand on his skin, and you perceive in it a harsh, dry, hot feel. You may not, and much oftener will not, perceive this sharp heat in the skin immediately that you lay your hand on it; you will have to keep your hand there a considerable time before you feel it perfectly; his pulse will give you little or no insight as to what is going on, for although it may be quicker than natural, it is still without that hardness which you find in other inflammations—the moment you find these symptoms together, you may be sure pneumonia has begun; you must immediately bleed him, and adopt other means of arresting the evil; if you wait for anything more decisive, you are too late. On dissection, you find the pleura lined with coagulable lymph, and adhesions formed; or you may find an effusion of serum or suppuration may have taken place, and you may find pus formed in the substance of the lung, or lying in the cavity of the pleura, or there may be a circumscribed abscess somewhere in the cavity. After the matter is formed it may become diffused in the cavity of the chest and retained there, or it may get exit by the external wound, or it may make its way into some of the bronchial tubes, and be discharged from time to time by coughing, or it may burst suddenly into the trachea and produce instant death.

The ushering in of this suppuration is marked by much more decisive symptoms than was the inflammation which preceded it; you will have the irregular rigors, profuse sweats, and other signs of suppurative fever, and we cannot be in any doubt but that the matter is formed, and if it be in the bag of the pleura, we are told we must let it out. But, as it is not always in the bag of the pleura, how are we to discover that it is there at all? We are told that the

patient can only lie on the side of the chest in which the matter is—that the ribs of the affected side are divaricated, and form a projection—that we can hear a gurgling noise in the chest on the patient's moving quickly or is shaken; but matter has been found in the chest, after death, where not one of those symptoms had been present; and, besides this, every one of them are better marked when water, not pus, is in the chest. Sometimes, too, the patient can lie better on the side opposite that in which the matter is, and I have seen such a case; sometimes there is no gurgling noise, and sometimes you can hear it without either pus or water being in the chest. I saw a remarkable and somewhat ridiculous instance of this in the Edinburgh Infirmary, where the opinion generally was that there must be either water or matter in the man's chest; all the pupils heard the noise distinctly, and the man was very much teased with the frequent examinations and shakings he underwent. However, Dr. Hamilton fortunately took him under his care, and treated him, as he did every one, after his own plan, with purgatives, and the man got perfectly well; but the gurgling noise continued notwithstanding, and does to this day if he be alive. The whole cause of the noise was in his bowels. As to divarication of the ribs—the disease must have existed a long time before this will be evident.

An abscess will point between two ribs: you open it, and you may, if you please, call this the operation for empyema, although with all the pomp and circumstances of such an operation, you only get into the cavity of a circumscribed abscess, without at all entering that of the thorax. These circumscribed abscesses are produced from many causes not connected with wounds or other injuries of the chest itself—as,

for instance, a woman swallows a needle, and it will now and then happen that this needle makes its way into the thorax—after some time it approaches some spot in its walls, and as it gets to the surface, forms an abscess, which is opened, and the needle and matter are discharged; but there is no communication between the cavity of the pleura and that of this abscess, and yet some would call the puncturing this little collection of matter the operation for empyema. You should be guarded how you undertake paracentesis of the chest, for all the symptoms of collections of matter there are very equivocal, and the most experienced surgeons have failed of success in the operation much oftener than they have succeeded. But as these abscesses or wells of matter *have* been evacuated, and the patient got well, as you can hardly make the patient's condition much worse—as you may be urged to attempt something for his relief, you may perform the operation for empyema, taking care, however, to warn his friends how very slight a chance it is in your power to give him. You should not forget that these cases may get well of themselves—that the matter may make its way into the trachea, and be gradually evacuated by expectoration, his respiration growing more free from day to day—that it may be spontaneously discharged externally, or take other and even safer routes, and your knowledge of the possibility of this favourable turn of affairs will check your disposition to use any active measures prematurely, which might compromise your own character without much chance of benefiting your patient. Should you find that nature is removing the matter, you must support the patient's strength by tonic medicines. If there be great debility, the recovery will be very slow; should the patient be disposed to

consumptive disorders before the injury, his chance is next to nothing in whatever way he may be treated. You will, however, be cautious in giving him bark or other powerful tonics, if you discover that his lungs are tuberculated, or any other sign, that, without the occurrence of any accident, he was likely to suffer from idiopathic disease of his lungs.

Cases will occur now and then, where it will be necessary to evacuate matter contained in the bag of the Pleura, although such are not so frequent as you might be led to think, the operation for empyema is easy enough to perform, but the place in which you are to make the opening is the great difficulty to decide on. Some direct the lowest part of the cavity as the place, but this, as we shall see by and by, is the very worst place that could be selected. If you dilate the wound, as others advise, you only break up the recent continuity formed by the adhesive inflammation without getting into the cavity of the chest at all. When the Yeomen were the lords of the creation in this city, one of them took it into his head to shoot a bullet through the chest of a poor old woman that was walking along the street; matter formed in the pleura, and after some time attempts were made to evacuate it where the original wound was, but without success, and an opening had to be afterwards made in another situation. The woman died, and, on examination, it was evident that from the thickness of the intervening new structures, and the distance of the matter from the wound, it would have been next to impossible to come near the matter there. You are directed to make your opening between two particular ribs; but if there should be emphysema present, you will not be able to feel a rib at all; or there may be such œdema as to

hinder your distinguishing the ribs, and of course they can, in such cases, be no guide to you, and such cases are not unfrequent.

Speaking of Emphysema, which you know is air driven into the cellular membrane, it has sometimes been fatal, and how? We are told it is by the air in the cavity of the thorax pressing on the lungs, and I believe it is so; the air in this affection will sometimes distend the whole surface of the patient's body down to his very toes; it is of greater extent in proportion to the smallness of the wound in the lung. I had an opportunity of examining a case, where emphysema supervened on two wounds of the lungs—one was a large one, the other not bigger than a pin-hole, and was made by a single grain of shot. I found the former quite closed by the adhesive inflammation, while the latter was the sole opening by which the air had made its way out.* To remedy this pressure of the air on the lungs, we are to dilate the external wound, or make a puncture at the seat of the wound, and no where else. In this case we are not left a choice of place to make our puncture in; but when we are to evacuate matter or water from the chest we are not so limited.

The place to operate on in empyema is, in my opinion, referable to the inferior angle of the scapula. Place your patient on the side opposite to where the matter is; place his arm of the affected side on a line with the body, the elbow being just over the highest part of the crest of the ilium; you then have the

* The student should recollect that extensive emphysema may come on without any wound of the lung or of the thorax, or in fact any wound at all. See Portal's work, Burns on the Head and Neck, Dictionnaire des Sciences Medicales, vol. xii., &c.—*Ed. of Lect.*

scapula fixed; then measure four fingers' breadth downwards from the angle of the scapula, and four fingers' breadth transversely from the spinous processes of the vertebræ (to get clear of the thick mass of muscles near the spine) until it meets the perpendicular line, where they decussate, there you should puncture. You are first to make an incision three or four inches long in the transverse direction through the skin, next through the latissimus dorsi, and next through the intercostal muscles, and then you get upon the pleura. Now, some advise you to tear through the pleura; but in many of these cases the membrane is thickened by disease, so as to be several inches thick, and you might be tearing until you were tired before you could get through. I once operated for this empyema, and I had to cut cautiously through the pleura until the whole knife was in the wound. The moment you get into the cavity of the chest, and that the air enters, the patient gives a great convulsive gasp or two, but this goes off directly.

Where the operation is performed for hydrothorax, few recover from it, as the lung is diseased and solidified; in less than a month after you perform it in this case, for a child suppose, you will find there will be a second accumulation which will require your attention. The operation for empyema is sometimes successful, but not in one case out of ten of those of which you read. I am convinced that many cases given to us as evidences of success, were simple abscesses of the lung, which, on being let out, did well, if the patient's constitution was good. There is one case where a most serious mistake may be made in our diagnosis of fluid in the chest. I was once called into consultation with some of the most eminent men of the profession, on a case such as I allude to. The

patient had every one of the symptoms laid down as indicating a collection of matter in his chest—there was great dyspnœa—difficulty of lying on the side—divarication of the ribs, &c. Every one present, myself among the rest, agreed that the operation was proper and necessary. Well, it was performed, and what was the result? Why, the case was found to be fungus hæmatodes of the lungs. This was a circumstance I never could have suspected.

I stated that the lowest part of the chest was the worst place to open the thorax at, and so it is, for the ribs and diaphragm lie so close to each other here, that the surgeon may go on cutting deeper and deeper, until he finds at length that he is really cutting into the substance of the liver. Some abscesses of the lungs will cause a divarication of the ribs, and even a pointing between two of them, and an opening may be made into it, and the matter be discharged; but the abscess must be quite superficial; for of course no man in his senses would think of cutting through any thickness of the lung to evacuate an abscess in it. After the operation for empyema no particular treatment is required.

If the wound in the thorax grows fistulous, and continues to discharge profusely, you may be certain there is some foreign body there keeping this state of things up. If the discharge from this wound suddenly diminishes, and the opening shows a disposition to close you must keep it open, to prevent extravasation into the cavity of the chest, and this may be done with a common canula, but if the discharge gradually diminishes, and the wound begins to heal, you need not, under these circumstances, interfere.

There are complications in certain wounds of the thorax of which I can have little to say, because little

or nothing can be done in these cases. The diaphragm may be transfixcd through the chest, and it is said hernia of the stomach or colon may occur through the opening from the abdomen into the chest; nothing can be done here. The great vessels of the heart may be wounded of course, but this will be instantly fatal. The ventricles of the heart itself may be wounded, and though the injury will be certainly fatal eventually, yet if the wound be small the patient may live for five or six hours, or even half a day.* Anything you can do, however, will not retard, much less prevent, the fatal termination.

I believe it was the death of Lord Nelson that introduced the discussion concerning the propriety of cutting out a ball when lodged in the spine; where a ball enters the spine, I think the case quite hopeless, and if you did cut out a ball—supposing the thing always possible—you would not add a day to the patient's life.

* There is a preparation in the Museum of the College of Surgeons, of a small penetrating wound of the left ventricle, the subject of which survived for three days after the injury.—*Ed. of Lect.*

LECTURE XV.

INJURIES OF THE ABDOMEN—CONTUSION—INCISED AND
PUNCTURED WOUNDS—WOUNDED INTESTINE.

WE shall now pass to *Injuries of the Abdomen*.—Wounds in this region admit of the same classification as did those of the thorax—viz., those affecting the parietes only, and not entering the cavity—those entering the cavity, but still only injuring its walls; and lastly, those which having penetrated, have injured some of its contained viscera. They are also divided into incised, punctured, contused, &c. Contusion on some parts of the abdomen may cause instant death in a way not very easy to understand. A man gets a blow, say, over the region of the stomach; he drops down, and in a few seconds he is lifeless, and when you come to inquire the nature and extent of the injuries the parts have received, you do not detect a single lesion that could account for that man's death. But contusion, without any external mark, may rupture some of the hollow viscera contained in the abdomen, or even some of the solid ones which contain a great deal of blood in their structure, as the liver, spleen, or sometimes the kidney. The contusion may also rupture the vena cava or some other of the large vessels traversing the cavity; but these cases are beyond your aid, and the last of them is almost instantly fatal. Although sometimes a blow of no great force will produce any of those internal injuries, the worst results from musket or cannon balls,

which, nevertheless, may leave no external mark. On the other hand, a man in a duel, suppose, may receive his adversary's ball at the abdomen without its having penetrated—the part struck is contused, and a tumour is soon seen on the part, yet after the first shock is over, the man suffers little or nothing, and the whole cause of alarm may be owing to the ball having struck his watch, or a piece of money in his pocket, or any other hard substance lying between the ball and the skin, and, if not officiously meddled with, is found to be of no consequence whatever. A wound from a sword or bayonet may traverse the layers of which the abdominal parietes are composed, without entering the cavity, and if the weapon does enter the cavity, it may not injure any of the viscera. Superficial wounds of the belly are to be treated like simple incised wounds in any other situation. You bring the edges together, and retain them with strips of adhesive plaster, and put the patient in the best position you can to relax the parts; you keep him perfectly quiet; you give a laxative medicine; if you deem it necessary take some blood from his arm, and watch carefully any untoward occurrence that may arise; but this kind of wound here does not differ from similar wounds elsewhere.

Suppose a man receives a stab from a knife, can we tell whether it has penetrated to the cavity of the abdomen or not? Why, we are told to put the patient into the position in which he was when he received the wound, and then to examine the depth and direction of the wound with the finger, or a bougie, or probe. You never could ascertain the fact in this way, because the walls of the abdomen are composed of many layers not strongly attached to each other, so that the instrument may go to a considerable extent

between those layers when we think it has surely entered the cavity. But, besides this, there is no use, but great danger in all this poking of the wound, if the instrument has really entered the cavity of the belly, as we shall see presently. Recollect if you push in a probe, or anything else, when one of the viscera are wounded, the patient must die. A man, we will suppose, gets a stab which penetrates but does not injure the viscera, and there appears no bad symptoms—is this man safe? No. He is in very great danger, for inflammation may take place in the peritoneum; this may become diffused, and the patient die; if, however, the peritoneal inflammation is circumscribed, adhesions may take place, and the patient may recover. When such a wound heals, we should tell the patient that he will always be subject to a little swelling protruding at that spot—in fact, that he will always have a rupture there; even if the muscles heal ever so perfectly the hernia will take place, for there is nothing restrains the protrusion of the abdominal viscera but the peritoneum. I saw a corporal who had a hernia in the lumbar region, near the spine, where the peritoneum had been injured, without any external wound in that situation, and certainly if muscles were capable of restraining a hernia, there were here plenty of strong ones, but they did not prevent it.

Sometimes in penetrating wounds there will be no protrusion of the viscera, and this can be explained by the omentum lying between the bowels and the wound, contracting adhesions there, and in this way acting as a kind of valve to prevent the exit of anything from within; there generally is a protrusion of the bowels, however.

A penetrating wound of the abdomen may be the *indirect* cause of a fatal inflammation of the perito-

neum, as in one case I saw ; it was a wound of the epigastric artery. In this case there appeared more blood coming from the wound than I thought should come from such a one ; the exact occurrence, however, was not discovered in time, and the patient died of slow inflammation of the peritoneum, of the diffused kind ; the quantity of blood effused in this case was really very small—barely enough to separate the peritoneum for a little way, yet its presence produced the inflammation. If the wound be a punctured one, how are we to know if the bowels are injured or not ? We are told that fœces will appear at the wound, and certainly if they do, it is a proof, and the only real proof, that the intestines are wounded. You are not to trust to the appearance of blood in the *stools*, for the quantity of blood from a wounded bowel must be very small, and the feculent matter, in that portion of the intestine wounded, may not be expelled for two or three days ; but with the great uncertainty that must exist as to the state of the viscera in these wounds, it fortunately is of no consequence whatever, in a practical point of view ; for whether the intestines be wounded or not, the treatment must be the same. If a portion of intestine be wounded, adhesions may form around the wound, connecting it to some neighbouring part, and extravasation be effectually and permanently prevented, and the patient do very well ; but if, in your anxiety to know the whole of the mischief that has been done, you go on searching with probes, &c., you disturb the adhesive inflammation that nature is perhaps setting up to prevent extravasation, and you will certainly destroy the patient. No matter how small a quantity of fœces is extravasated into the peritoneal cavity, diffused inflammation must follow. Do not, therefore, meddle with the wound,

not even to handle it : there is no excuse at all for touching it : it can only serve to gratify an idle curiosity without doing any good, and will put the patient's life into great hazard.

If an intestine is wounded, the *fœces* will sometimes be discharged by the wound, and sometimes not ; we cannot tell why this is the case, but so it is. When the *fœces* do appear at the lips of the wound, is the case more dangerous ? No ; it is much less so, because there is then free exit to the matter, and less danger of extravasation. All you have to do is, to keep the bowels soluble, and after the first shock of the injury is over, to bleed the patient. Suppose a man is run through the belly, and in six hours after there appears a softish tumour about the wound, what is the nature of this case ? It is an effusion of blood from some pretty large vessel, but it is circumscribed, and in a few hours that blood is surrounded by a cup of fibrine, and after this is formed it cannot become diffused. The patient may recover of this in two ways—either the blood will be absorbed, or the suppurative process will be set up, and the blood be eventually discharged externally. If you attempt to let out this blood on the second or third day, you will bring on inflammation, but after several days have elapsed, when the parts are ready for the healing process, it may be let out by the lancet as in other cases of the kind. We read in books on military surgery, that when blood is poured into the cavity of the abdomen from a wounded vessel, it is always diffused, but we can account for this by the peculiarity of circumstance attending military practice often. The patients have to be moved from one place to another, perhaps before the second day, when the army is advancing or retreating, and this prevents the adhe-

sive inflammation taking place, to circumscribe it; but when the internal hæmorrhage is considerable, the adhesive inflammation certainly does not take place. Suppose a man shot in a duel—the ball enters the abdomen and wounds a large artery—he falls and faints—presently he recovers out of this—but his pulse is remarkably variable; sometimes it is strong and bounding, again it becomes weak and thready: the hæmorrhage is here considerable. The bounding pulse, which always accompanies hæmorrhagic action, indicates that the bleeding is going on, the patient then gets weak, and it stops—very soon he rallies again, and again it goes on, and at length he dies. A man gets a contusion in the abdomen from a fall, and a pretty large tumour forms, how are you to know whether this is caused by blood or fæces? A collection of fæces, in such a case, never forms a *large* tumour, it must therefore be blood. This patient may recover; but all you can do for him is to bleed, bleed, bleed.

There is a case you will often meet with, where, in a penetrating wound of the abdomen, a portion of bowel and omentum protrudes. You examine both, and you see they have received no injury; but their appearance is not the same in the living man as they would be in the dead subject. In the latter, if you make an opening into the abdomen, and draw out a piece of intestine, it lies flat and flaccid, and from your observations you might suppose there could be no difficulty in returning a protruding bowel in the living subject, and indeed you might be right in your conjecture if the parts engaged were in a similar condition; but in these cases of wounds you find the bowels, although perhaps coming through a very small aperture, are greatly distended with air, and you will find

that it is a very difficult matter to get them back again into the abdomen. What are you to do then? Some tell you to prick the gut with a needle to let out the air, but this is all nonsense; for, if you were to use a very small needle for the purpose, no air would come out, because the mucous membrane immediately closes up the little orifice, and if you use a large needle you excite inflammation, and leave an opening for other matters to escape too. If you attempt to push back the bowels through the opening by which they got out, you will not succeed, but will probably do great mischief to the bowels themselves; you are therefore to enlarge the opening, as the only means of accomplishing your object. Now, in what direction are you to do this? A good deal must depend upon the situation of the injury, and the direction of the original wound: you would not willingly cut across the fibres of the rectus muscle, if cutting in the direction of its fibres would answer as well; then, if the wound is straight, and of some length, you would prefer enlarging it at one of its extremities; if the wound be made, suppose in the side of the abdomen by a cow's horn, you would save most muscular fibres from division by enlarging it somewhat transversely, and if omentum be protruded with the bowels you may as well make your incision downwards to avoid the omentum. The operation is done in this manner; you get an assistant to keep the intestines out of the way, and introduce your nail (for you cannot introduce your finger) as far as you can into the wound, and on this a probe-pointed bistoury, take care not to pass its button beyond the end of your nail, against which it rests. Whether you employ a flat piece of silver, or a director, or your finger to guide the knife, watch well that the intestine or omentum does not

wrap itself round it so as to get in the way of the edge of the knife; you can then divide the constricting parts just enough to enable you to get in your finger, and let *it* afterwards direct the knife. Now, when you have enlarged the opening to the proper extent, you would be inclined to think that it would be a very easy matter to return the protruded bowels, but this is really not the case. Unless it is managed properly, you will find that for every bit you put up, twice as much will come down; when you return a portion then, lay the fingers of your left hand on the opening while you are grasping another portion with your right hand to return next. There is one manœuvre I have seen tried, against which I would caution you—namely, pulling a little of the intestine down out of the wound to enable you, as you might think, to get up some of the air that distends that which has been protruded; but this would only add to your difficulty, for what you draw out immediately gets as full of air as any other part, and will give as much resistance to its return again into the abdomen. Should you find the protruded intestine in an inflamed state you must nevertheless return it of course. Should the injury the bowel received by bruises or constriction have caused gangrene in a part of it near the wound, adhesions will have formed between the gut and the wound which you must not disturb, but leave nature to throw off the slough, and perhaps effect a cure. Sometimes a good deal of omentum presents itself, and this, if uninjured, you will also return, having previously spread it out carefully not only to ascertain its condition, but lest it might be gathered round a portion of intestine, which it might continue to constrict firmly after both had been returned into the abdomen. Should one of its arteries

be wounded put a ligature on it, and let its end hang out of the wound.

Should a portion of the protruded intestine appear flaccid, instead of being distended with air, examine that portion carefully lest its flabbiness be owing to a wound in its coats. It is always suspicious when it does not retain its rounded figure. The intestines are seldom wounded by the weapon on its entering the abdomen, but more generally by a second blow after it has escaped from the cavity. After the protruded parts have been returned fairly into the abdomen, how are we to manage the wound in the parietes? I mentioned that in a wound where there is no escape of the viscera, and when we cannot be certain whether the instrument has penetrated the cavity at all, we should dress it with sticking plaster as if it was a simple wound of the parietes, but where intestine has come out, we must in every such case use sutures; the ligatures must go through the thickness of the skin and muscles, but should not by any means include the peritoneum.

Care must be taken that while you are, as you suppose, returning the intestines back into the abdomen, you are really not pushing them into the sheath of the rectus muscle. Do not think this an unnecessary caution; I have seen two-thirds of the bowels protruded, pushed up into the sheath of the rectus, before the mistake was discovered. Before you return the protruded intestines you will examine them carefully but as gently and with as little delay as you can: if they have dust or gravel on them you will wash it off with warm water. Should one of the vessels of the intestine be wounded, just put a ligature on it, and cut their ends close, and so return it into the abdomen. If the omentum be injured cut off the piece with a sharp

knife or a pair of scissors, and if any vessel should bleed, take it up with a ligature and return the rest of the omentum. If no vessel should bleed at the time of your incision, you may return the omentum at once into the abdomen without any dread that it will bleed internally, for should any vessel in the cut surface have a disposition to bleed, the natural pressure of the surrounding viscera will prevent it. Suppose you are called in to a man who has got a stab in a drunken quarrel, that he has lain out in the streets all night, and that in the morning when you come to see him you find his bowels protruding from a wound in his abdomen, you examine the intestines and you find one of them wounded, what are you to do? You know from the circumstances that inflammation must have commenced in the part, and you see that it is so. Are you then to set about immediately to sew up that wound in the bowel? You are not by any means to do such a thing, for no union could take place, and your attempt would only aggravate the already existing inflammation. Suppose you see a patient so soon after the injury, that the parts offer no fair objection to a trial to procure a union of the wound in the bowel, still you will find the sewing of it up a very difficult undertaking. The state of the wound is this—the muscular coat of the gut has contracted, and the mucous membrane, which has no disposition in the least to contract, and which is naturally so loose and abundant, is squeezed out of the wound and as fast as ever you push it with your finger back into the canal from whence it came, out it comes again, sometimes before you can withdraw your finger. Now, under any condition you will not be able to make two mucous surfaces unite with each other, nor a mucous with a serous surface, and before you can bring

the lips of the wound in apposition, without any interposition of mucous membrane, the whole of what has been squeezed out must be returned, and retained out of the way of being pricked or torn by the needle. To remedy this difficulty it was proposed to pass a piece of card rolled up into a cylinder into the cavity of the intestine and to draw the outer coat over it, and then to begin sewing it up; another contrivance was to introduce a piece of tallow candle into the bowel with a similar view, and to leave whichever you employ to be afterwards expelled by the natural action of the part. Although the difficulties in keeping the lips of a wound in a bowel in apposition, are not much exaggerated by writers, we shall see that their contrivances are not indispensably necessary.

We shall now suppose that, on coming to the man, you find no protrusion of the viscera has taken place from the wound in the parietes, for this will sometimes happen, but on looking closely, you see *fœces* coming from the wound, how far are you to interfere in this case? Any meddling with such a case will certainly take from that man his only chance of recovery; an adhesion has taken place between the wounded bowel and the external wound, it will speedily acquire considerable strength, extravasation is prevented, and there are grounds to hope a favourable termination; but if any trials be made to fix the gut by art more firmly in its position, and prevent its receding, which is quite unnecessary, or if any tampering with the wound with any other view be had recourse to, the adhesions nature began will be disturbed, the wounded bowel will be shifted, extravasation will follow, and the patient must die. The free discharge of *fœces* through the wound is his best chance; you will not, therefore, attempt to sew up the

external wound, or dress it in any way that may confine the discharge; no measures must be taken to heal it until the fœces gradually, and of themselves, cease to come from the wound.

The danger from extravasation into the abdomen is its causing peritoneal inflammation, and it becomes a point of great importance in our prognosis to be able to determine, whether, in a particular case, the effused matter be blood or fœces; you see nothing, and are only able to judge from effects. If the peritonitis be from the escape of fœces, the inflammation invariably comes on within twenty-four hours from the receipt of the injury—never later—while that resulting from blood comes on at a much later period. In the first case the patient must die, no matter how small the quantity of fœces may be that escapes into the cavity of the peritoneum; in the latter case he may recover. Protrusion of the viscera of the abdomen in the form of hernia will always take place after the healing of the wound in the parietes, wherever the peritoneum is deficient, even though the rest of the parietes be perfect; as I before mentioned, the muscles will never resist the protrusion. You must always bear in mind that the abdomen is constantly so full, that there is naturally no interval between the viscera, and that in those wounds, the introduction of a probe or other instrument to examine the nature of the injury will cause an interval or space for extravasation. Suppose a man gets a sabre wound in the belly, and that fœces are observed coming out from the wound, some say that it is useful to find out the wounded bowel and sew it up, and they direct that we should dilate the external wound and look for it accordingly; but remember that fœces will escape from a very inconsiderable wound of an intes-

tine, and we might have to go over the whole intestinal canal before we found it, and even not find it with all our searching ; even in the dead body it would not be easy to find it.

But suppose you see a portion of the protruded bowels with a transverse division of it, how are you to unite these again ? John Bell tells you, you are to put three stitches in it, one at the mesentery, and the other two at equal distances from it and from each other ; but when Mr. Bell wrote this it was his imagination, rather than experience, which directed him. The fact is, that three stitches in such a case would be worse than if you had done nothing at all ; there would be a drag on these stitches ; the mucous membrane would protrude between them, and the fæces escape. Mr. Travers made a number of experiments on animals, and he found that there was more danger of extravasation from this kind of stitching than where the matter was left to nature. John Thompson found in his experiments that the wounded part of the intestine often formed an union either with the sound wall of a neighbouring piece of gut, or to the inner side of the wall of the abdomen next it, and when the union was complete there was no further danger of extravasation. When you have the bowels cut either longitudinally or transversely, all you have to do is to take a small needle and a single thread, and sew the *entire* wound, from end to end, with the continued or glover's suture ; you will not have occasion to put card, or candle, or anything else, into the gut to sew on, or keep it open. When you have sewed the wound all round, cut the ends of the ligature close, and return the bowels. Great danger was apprehended from the thread getting into the peritoneum, on its separation, and its exciting inflamma-

tion there, but experiments prove that it never takes this course, but makes its way into the cavity of the intestine, where it can do no harm, until it is discharged in due course. Nature always gets rid of an extraneous body in the shortest and easiest way, and it was a much simpler and easier way to get rid of the ligature by the bowels, than for it to come through the parietes of the abdomen. When a musket or pistol ball enters the abdomen, and lodges in the spine, it is always fatal. I remember seeing an officer who was shot in the abdomen, and the surgeon who attended him was of opinion that the pancreatic duct was wounded, for a pint of clear fluid was discharged daily from the wound. I gave it as my opinion that the ball had penetrated the spinal canal; the officer died, the surgeon was allowed to examine him, and he sent me word that the nature of the injury was precisely as I had said.

The stomach may be wounded by the thrust of a sword, and the man recover, although the contents of the viscus may flow out of the wound externally. I recollect seeing a man in the hospital who had such a wound, and it had become fistulous; he used to take a drink, and then take out a cork which he kept in the external wound, and let the fluid flow out just as he had swallowed it. When, from the part of the abdomen wounded, and what you can learn of the direction the stab was given in, you apprehend a wound of the stomach there will be strong presumption that your conjecture is right if the patient be very cold: if he vomits, or tries to vomit, and if what is thrown up contains blood. The patient from such a wound is in imminent danger. It is a singular fact, that if the patient vomits or strains much, or even takes an emetic, it does not cause effusion of the contents of

the stomach into the abdomen. In wounds of the stomach all you can do is to keep the patient on the smallest quantity possible of food, and make him observe the most perfect quiet. I mentioned that a spent ball striking the abdomen, but without entering it, causes contusion, and particularly if it be a large ball, and that if any of the more solid viscera should lie behind the stricken part, it may be ruptured; the liver, kidney, spleen, &c., have sustained such injury, and therefore we should be very cautious in our prognosis and care of the patient, no matter how trifling the injury may seem at first. A wound of the *Spleen* is very dangerous, on account of the quantity of blood it contains. If you read Bell, you would suppose that every wound of the *Liver* was mortal, but this is not the case: wounds have been received in the liver and gall-bladder, and the patients have recovered, and what is very remarkable, there has not been observed in any wounds of these parts any extravasation of bile. It is not easy to be satisfied that the liver or spleen is injured in a punctured wound of the abdomen, by conclusions drawn from the direction, or supposed direction of the wounds. If the liver should have been wounded, there will be fever, pain in the shoulder, a teasing dry cough, &c.

Gunshot wounds of the bladder are not always mortal. I saw a man who received a ball that went exactly through the sciatic notch, and penetrated the cavity of the bladder; it did not go through, but lodged in the bladder. After some time the patient found he could not make water, but after a deal of effort, a piece, or rather two pieces of cloth, which were rolled up into a ball and had lodged in his urethra, were shot out, and he then made water freely enough; but the ball still remained in his bladder,

and the only inconvenience he felt was, that he could only make water while lying on his side. He could not make a drop in the erect position, and he afterwards submitted to the operation of having it cut out. Here is the ball, and although it remained twelve months in his bladder, you perceive there is not the slightest appearance of incrustation on its surface; it was not cleaned, but had the appearance you now see it to have, when it was extracted. In gunshot wounds of the bladder, urine is never effused, but the case is very different when it is ruptured by a kick, or a fall, or blow, &c. In such cases it always gives way at the upper and posterior part, where it is covered by peritoneum, and the opening is large. When the bladder is burst and the urine effused, the patient does not complain of any pain in the region of the bladder, but he feels an uneasiness in the chest, or, as they say in the country, "about the heart." Some time after the accident, the patient feels a desire to make water, he tries to do it, and feels as if he was relieving himself, but is surprised that he does not see any coming away; if a surgeon introduces a catheter, no urine comes, and yet what is very curious, if he introduces it again in, say a quarter of an hour, urine will come away. After a little time the patient feels nausea, and afterwards he vomits, but still there is no pain in the region of the bladder. A patient with this injury will die in about ten days, generally. [Two preparations were here shown of ruptured bladder; * both had given way at the upper and back part—

* These two preparations are in the Museum of the College of Surgeons. The history of one of the cases may be found in the Dublin Hospital Reports, vol. i.—*Ed. of Lect.*

the slit in one was transverse, and in the other vertical; one was an inch and half long, the other about two inches, but the ruptures in both were longer before they were put into spirits.] I know of nothing that will be of use in this case of rupture of bladder. A bullet wound in the bladder, or one with a sword, is less dangerous than a rupture from violence. It is a curious circumstance that a fluid, apparently so acrid as urine, should remain in the cavity of the abdomen several days, without causing the patient much suffering, and that the fatal termination should not take place earlier than the eighth or tenth day.

LECTURE XVI.

PERITONITIS—PARACENTESIS ABDOMINIS—WOUNDS OF
TENDONS.

INFLAMMATION of the peritoneum may arise without any local cause, or from wounds in or about the abdomen, and is the chief source of anxiety after certain surgical operations there. Indeed, so many operations has the surgeon to perform—so many accidents and surgical diseases are there, that may be followed by peritoneal inflammation, and in which that consequence assumes a paramount importance, that it requires a special notice. Thus, the various affections of the bladder, perineum, uterus, rectum, &c., and operations on these organs, or at least most of them, would not assume the serious characters that distinguish them, were it not for their liability of being followed by peritonitis. When considering those cases individually, I shall have an opportunity of pointing out some peculiarities belonging to each, in connection with the inflammation of the serous membrane of the abdomen; at present we can only consider the subject in a general manner. It may be either acute or chronic. A child, suppose, gets a fall on his belly; he gets up and vomits; inflammation of the peritoneum sets in, and he dies in a few hours. This is an acute case, arising, perhaps, from rupture of a piece of intestine high up; that arising from strangulated hernia may be either chronic or acute. Suppose a young man in full health leaps off a wall and gets

hernia, which becomes strangulated, he gets acute peritoneal inflammation, and may be dead in thirty-six hours; but in an old man with an old hernia that becomes strangulated, there will arise an inflammation of the chronic kind. The inflammation is sometimes confined to a very limited space; as where a piece of intestine adheres to the neighbouring parietal portion of peritoneum, or to another piece of intestine; here the inflammation causing the adhesion is confined to one spot, and no bad symptoms or consequences follow; but this is not always, or even generally the case, for the inflammation beginning in one spot, more generally spreads through the whole peritoneal surface. Should it come from a wound, the first pain or uneasiness is felt at the wound. You are not to expect anything like prominent well-marked inflammatory symptoms in peritonitis; the first thing noticed perhaps is that the patient on making any exertion, such as coughing or blowing his nose, feels a little tenderness in his abdomen; if pressed on, the patient winces; after a little time his stomach begins to give way, he feels nausea, and shortly after vomits; his thirst at first is inordinate, and he drinks largely, but after some time, this symptom becomes less, and less drink satisfies him. His first vomitings have nothing peculiar in them, and what is thrown up is just what he has last drank; he drinks but little, yet as soon as it is down, he gets sick, and up it comes again. At a more advanced period of the disease, however, he has ceased to drink or feel much thirst, yet his stomach does not get better; he now vomits what is called stercoraceous matter—that is the fœcal matter from the small intestines; when he vomits at the first accession of the disease, there is the ordinary exertion in emptying the stomach of its contents, but after-

wards it discharges itself with as little exertion as an infant makes to discharge coagulated milk from its stomach; he just opens his mouth, and out comes this dark-coloured or feculent matter. If there should have been no wound of the peritoneum, the pain is commonly first felt about the navel.

Constipation is so constant a symptom in peritonitis that it is considered one of its pathognomonic signs, but although the difficulty of procuring stools is in general very great, yet we now and then meet with cases where the patient has many stools, and I have known young surgeons to say—"This cannot be inflammation of the peritoneum, as the patient has stools;" but you should not, in every case where you are told that the patient has had one or more stools in the course of the night, trust to the accounts you get from the nursetender, or the friends of the patient, but look at the night-chair, and you will see that nothing has been passed in general, but a little mucus each time; there may be one or two evacuations in peritoneal inflammation, but that is all. At first the pulse is full and inflammatory, but very soon it becomes very small and wiry, and generally ranges from eighty to one hundred and ten, but it is not by any means what you would think a highly inflammatory pulse; although if you examine it carefully, you find it is not as compressible as a healthy pulse; in fact, it is such a pulse that would make you almost afraid to bleed the patient—yet what does bleeding do? It raises that small pulse up to the standard of what you would call a full, strong, inflammatory pulse, such as you would meet, for instance, in inflammation of the extremities. There is in this patient a peculiar cast of countenance; his face appears languid and depressed, and is covered with a greasy sweat; his

eyes, which were a little before full, now become sunken, as if the adipose substance of the orbit had become suddenly removed, and his eyelids droop a good deal over them; he gets that look of general sickness, or sickishness, rather, almost peculiar to affections of the abdominal cavity. He passes urine very often with pain, and tinged with blood, and generally in small quantity. If an enema be thrown up, it is either not returned, or if it be, generally without bringing away any fœces. By and by he grows very restless and uneasy; he tosses his arms about; at one time he throws one leg out of the bed from under the clothes, then the other, and without knowing why he does so; his face has not the fulness which accompanies other inflammations, but his features are drawn in; his weakness and languor increase; the pain over the abdomen is sometimes very great, but there are intervals of remission, during which he gets a little rest perhaps. Unless the first bleeding be very large, he may get but little relief from it, or if he is relieved, it may be but for five or six hours, and then his symptoms return. These exacerbations and remissions should not be forgotten as a part of the symptoms of these cases, for if you were to come in during a remission, and stay with him but a short time, you might be led into the serious error of believing him better when he was not, and cause a delay or suspension of suitable treatment. You should stay with him an hour or so at least, to see if it was really a permanent improvement or otherwise, or inquire of his friends, and tell them to remark if his pain returned, and if so not to lose a moment in sending for you, and on your finding them return, you bleed him immediately again. You direct the abdomen to be fomented, or rubbed with warm

oil. After full bleeding has been practised, and an impression made on the disease, you should give calomel and opium, in doses of three grains of calomel every three or four hours; your clysters now will empty the large intestines, and give a stimulus to the small ones likewise to act, and you may order a gentle laxative by the mouth, as soon as you find the inflammation sufficiently reduced, and some diaphoretic, not of a stimulating nature. While the inflammation is going on, you should visit your patient every four or five hours at least. Although you will be mainly guided by the tenderness of the abdomen on pressure, yet when your treatment has subdued all the other symptoms, this tenderness will not continue to demand depletion as in the first instance. A blister over the abdomen will then be of the greatest use, and will often in three or four hours quite remove this last trace of the disease.

The disease is sometimes fatal in from thirty-six to forty-eight hours, and sometimes not for four or five days. Do not too readily yield to despair in one of these cases, for it sometimes happens that after all the surgeon's hopes are gone, the patient suddenly improves and recovers completely.

From the symptoms alone, you would hardly believe that chronic and acute peritonitis were the same disease, yet dissection shows the same adhesions, &c., in both. *Every* symptom that would mark acute inflammation in general, is absent in that of the peritoneum; there is often no hot skin, full pulse, &c., but as you bleed the patient, the pulse expands, and *becomes* then like what you would call an inflammatory pulse.

To return to wounds of the abdomen. Suppose you see a piece of bruised intestine protruding from a wound, how are you to know it is in a state of gan-

grene? It is often a very difficult thing to tell positively whether it is or not. I shall have to say something on this subject when we are considering strangulated hernia; at present I may remark that there is a softness, a want of coherency, and a dulness of surface, that will excite suspicion: if you see a vein running on its surface, and that you press on it gently with the point of your finger, so as to empty it of its blood, and maintaining your compression on the portion next the mesentery, you observe whether it is filled again by the arteries, and if so, you are told there can be no mortification there. I have never seen this test tried, yet there may be something in it, but I think if the bowel be in a state of high inflammation there may be some difficulty in making it a satisfactory test. If there be a want of firmness or adhesion on the part of the intestine or lip of the wound, we must cut off the mortified part and connect the intestine by suture—the method of doing which I will have an opportunity of explaining at a future day. Hæmorrhage from the large vessels, as the vena cava, porta, or aorta, may follow wounds of the abdomen of course, but it more generally comes from some small vessel, and the general pressure of the viscera will, in such cases, limit the extent of the extravasation of blood into the cavity: if the large vessels suffer, the patient dies immediately; but in other cases the soft tumour, which I before mentioned, is formed; the hæmorrhage may cease for a little, and then go on again, and thus the patient may live for twelve or twenty-four hours, one time better, and another worse, until he sinks finally. But suppose, on the other hand, that the vessel having poured out a little blood, ceases to bleed any more, we have still another danger to encounter, for the man may

die of diffused inflammation of the peritoneum, caused by the presence of this small quantity of effused blood. I may just mention that it is possible to mistake this soft tumour caused by effused blood for a hernial tumour, or v. v., and if, from want of sufficient care in the examination of the part, this mistake were to be made, it might lead to serious consequences. Even effusion of blood into the abdomen, without tumefaction might be confounded with inflammation somewhere in the cavity, as the symptoms of either occurrence are not so very well marked or precise as to remove all obscurity; but mistaking one for the other is fortunately of no consequence whatever, the treatment of one being applicable to the other.

The wound of an intestine communicating with an external wound, and discharging fœces by that wound, is sometimes very slow in healing up; this will be what is called an *Artificial Anus*, of which I shall have occasion to speak more fully hereafter.

The term *Paracentesis Abdominis*, strictly speaking, is confined to puncturing the abdomen, to discharge the fluid accumulated in ascites. We need not inquire here more of the history of this complaint than that it is very often attended with enlargement of some of the abdominal viscera, particularly of the liver. Mistakes have been made as to the nature of the swelling of the abdomen in cases of dropsy, even pregnancy has been confounded with dropsy by the ignorant or careless; but the shape of the two swellings is not alike when looked at either in front or sideways; that of dropsy is more general, diffused, and rounded, than the swelling of the gravid uterus, and you are able always, I believe, to distinguish the more circumscribed and firm feel of the latter case.

The fluctuation is always sufficiently distinct if the examination be properly made, and the way you are to make it is this—Place one hand on the side of the abdomen, and with the fingers of the other hand, strike the opposite side smartly two or three times; the effects of your percussion will be transmitted sharply and distinctly to the hand laid on the other side of the belly. Pressing here and there is not so satisfactory, for an enlarged viscus may be pressed on and give a deceitful diagnosis. But the case may be ovarian dropsy, the fluid of which is contained in a sac of its own, and not in the general cavity of the peritoneum; as it enlarges, however, it mounts into the abdomen, and sometimes attains a very large size, and forms adhesions to the peritoneum when of long standing. Now, there are two situations particularly pointed out as the most eligible for puncturing the abdomen—one in the side, or in the *linea semilunaris*, the other in the middle line, or *linea alba*. The first of these situations is liable to several objections. The liver in ascites will sometimes be found to have descended so low that it will run a great risk of being wounded by any attempt to tap the abdomen in the *linea semilunaris* of the right side; and then if it be attempted to operate in the same situation on the left side, the spleen may be endangered; for both these viscera have been known to have attained to such a size as to have reached the iliac fossa of its own side. Then there is the danger of wounding the epigastric artery, which, you know, extends from the iliac or femoral artery upwards and inwards to gain the sheath of the rectus about midway between the crest of the pubis and the umbilicus. The operation of tapping through the *linea semilunaris* should be restricted to cases of ovarian dropsy. If you perform paracentesis

in the linea alba, there is nothing of importance you are in danger of wounding, in the ordinary state of the parts; but although in ascites the secretion of urine is greatly diminished in general, yet it may happen that this viscus shall rise up into the abdomen to a sufficient height to lie right in the way of the trocar. As it might be attended with very serious consequences to plunge your instrument into it by mistake, instead of into the cavity of the peritoneum where the fluid of dropsy is, you should always first ascertain the state of the bladder before you proceed farther, and if any doubt should exist in your mind, to introduce a catheter. Having placed your patient in an arm-chair, and passed a broad bandage or folded sheet round the belly, you give either end of it to a careful person, whose duty it will be to draw the bandage tighter as the water escapes, to maintain the same degree of pressure as the vessels and viscera had sustained by the fluid: want of attention to this has been followed by serious consequences. You then make an incision with a lancet about an inch long through the integuments, midway between the pubis and umbilicus, and then introduce your trocar through the linea alba; you know when you have gone deep enough by the sudden loss of resistance; a three-sided trocar is the best for this, for the wound left by it heals very readily. Sometimes the flow of the fluid suddenly stops, and no more will come: here the omentum has been thrown against the mouth of the canula and acts as a valve. You are told when this happens to introduce a probe through the canula and push back the obstruction with it; but it is not quite safe to push at the omentum in this manner with a probe, for it is a delicate membrane, and would probably sustain such injury as to expose

the patient to the risk of peritoneal inflammation. The ingenious instrument invented by Mr. Dease perfectly prevents any impediment to the discharge of the water, and of course a necessity of meddling too much with the peritoneum. You finish the operation by dressing the little wound with adhesive plaster, and tightening the swathe to the necessary extent. There is one circumstance in dropsy that will prevent the employment of Mr. Dease's trocar—namely, where the fluid is so thick that it will not be discharged through any but a full-sized instrument, as is often the case in general ascites, and almost always so in ovarian dropsy.

Wounds of Tendons, &c.—I mentioned that the *structure* of a part attacked with inflammation greatly influenced its nature and consequences, and the same observation holds equally good as regards wounds and other injuries. We find, for instance, that injuries of tendons, ligaments, and such like, produce consequences and require treatment somewhat out of the common rule. In a contusion or laceration of a tendon, we have indeed little to do more than would be necessary for a similar injury in any other part, but in a simple incised wound the case would be a little different. Suppose a man's Tendo-Achillis divided across by a clean cut of a sabre, that tendon will not unite, like other tissues, by the adhesive inflammation, but it unites to the circumjacent parts by coagulable lymph; these parts after some time become thicker and stronger than they had been before, and at length attain sufficient strength to bear the strain which the tendon had to bear before its injury, the functions of the part will be restored, but a knot or tubercle will long remain in the situation of the wound. This tendon, strong as it is, is occasionally ruptured; a

heavy man trying a feat of activity, or even sometimes in walking up stairs, or while walking along the street, feels something give way in his leg, or he feels exactly as if the back of his leg had been struck by a stone or a stick. On examining, you find the tendo-Achillis ruptured, or it may be only the long slender tendon of the plantaris muscle. If the tendon be snapped across very close to the heel bone, its torn ends will be separated about an inch from each other, rarely more; you will seldom be able to feel the separated ends of the tendon satisfactorily on examination. The patient is not deprived of all use of the leg immediately after the injury; a sickness comes over him just after the accident, but after recovering this he feels great pain in the part on trying to walk; he feels a weakness in it, and considerable tumefaction in the limb; in a couple of days or so it becomes black and blue, and there is effusion of blood, more or less, about a hand's breadth above the heel; on flexing the foot a hollow or deficiency may be felt in the tendon, before the swelling takes place, and if this can be perceived it leaves no doubt that it is not the tendon of the plantaris muscle that has been injured. Sometimes it is neither of these tendons that has suffered, but it is a laceration of some of the muscular fibres of the great extensors of the foot—in which case the incapacity to use the limb and the pain at any attempt to do so is even greater than if it had been the tendon that was torn across. In both cases, every attempt on the patient's part to extend the foot produces a return of the sickish sensation. Well, whether the division be by rupture or made by a sharp-cutting instrument, what is to be done for it? You cannot retain the separated parts by sticking plaster, compresses, or bandages—that's quite clear. Are you, then, to get

your needle and thread and sew the ends together, or put a point or two of suture in them? Neither one or the other would at all do here; the part would become inflamed, and the consequence would finally be convulsions, or tetanus, and death. You must then trust entirely to a proper position of the limb; you relax the muscles of the calf by flexing the leg upon the thigh, extending the foot upon the leg and applying a suitable apparatus to maintain the limb in the proper position. You will also put a roller on the leg to control the gastrocnemius and soleus muscles, the action of which would keep the ends of the divided tendon from each other, and disturb every attempt to repair the injury. Night and day the limb must be kept in the proper position for at least a month or six weeks, and even then you must enjoin the greatest caution in the exercise of the limb, on account of the great strength of the muscles engaged. At first you should use only a gentle passive motion, and this for the sake of the ankle and knee-joints, which have for so long a time been kept in one position. You then allow a little exercise of the limb, assisted by a crutch, and so proceed gradually to the full use of it.

The tendon or ligament connecting the patella to the tibia, has sometimes been torn across, but it is a much less frequent accident than fracture of the patella itself. There is no difficulty in recognising the nature of the case, and all that is to be done is to keep the leg constantly extended by a splint, to be worn day and night, to keep the patella drawn down by a bandage or strap fastened to the sides of the splint by buckles or studs, and to envelope the limb with a roller, to control the action of the four powerful muscles inserted into the patella above. You

may see cases of those ruptured tendons where the patient complains of very little pain, and hardly suffers except from the confinement and constraint of the limb necessary to his cure. It will be a long time before the perfect use of the leg is obtained, for, after the consolidation of the ends of the tendon with each other is strong enough for a little exercise, there will remain a knot, and a thickening of the surrounding parts, with adhesions, that will render free motion difficult and somewhat painful.

LECTURE XVII.

HERNIA—DIVISIONS OF—CAUSES OF—DISEASES RESEMBLING, AND DIAGNOSIS—TAXIS.

THERE is no disease in surgery that requires a greater share of your attention than Hernia; that in practice demands more correct judgment, or more prompt decision. You will now and then see cases in which the delay of an hour in doing what may be necessary for the patient, will make all the difference between probable safety and certain death to him.

Hernia is a displacement or protrusion of any of the abdominal viscera out of their proper cavity, and there are several situations in which the tumour formed by this protrusion may appear externally; but you are not to suppose an external tumour essential to constitute a hernia, for there are some instances, as I shall have occasion to point out to you, in which no swelling can be observed. There are several classifications of hernia—one is from its seat, such as *Inguinal*, *Umbilical*, &c.; another from the contents of the sac, as *Enterocoele* or intestinal, and *Epiplocele* or omental; another from some peculiarities in their constitution, such as *hernia infantilis*, *hernia congenita*, &c.; but the most important in a practical point of view is that which indicates the state or condition of the hernia; thus they are first divided into reducible and irreducible. By the first is meant a hernia, the contents of which may be returned back into the ab-

domen by the surgeon or the patient himself, but which is liable to return if not prevented by art. The second is a rupture, which, from adhesions or other causes, cannot be returned, but remains permanently out of its proper cavity. These two conditions of a hernia are not attended with much or any inconvenience to the patient, except from their size, weight, &c., in their simple state; although their existence renders the patient very liable to grave consequences, not only from external injuries, but likewise from the liability to fall into the next and worst state—namely, strangulation. A *Strangulated Hernia* is one which is so constricted by the opening through which it has passed out of the abdomen, or by the neck of the hernial sac, or by some malversion of its own constituents, that the functions of the protruded parts are entirely suspended, and their own vitality endangered, as well as the life of the patient.

Bell describes a kind of hernia, or rather a condition into which a hernia may fall, which he calls *incarcerated*, in contradistinction to strangulated; he is very obscure in his explanation of what he means by his incarcerated hernia, nor does it seem of much practical importance to inquire.

There are circumstances which appear to give a tendency to hernia. Some families would seem to have a natural predisposition to it; the father or the mother, and some of the children will have it. I know many instances where three or four children of the same family are affected with the complaint, and yet it does not, after all, seem in the least hereditary. When a very corpulent person suddenly becomes thinned, as from fever, &c., that person will be likely to get hernia. It is said that in Catholic countries, where the inhabitants take a great deal of oil with

their food, hernia is very prevalent, but I am not sure of the truth of this remark. In monasteries on the continent, they appear to be very subject to this complaint, and it is attributed to the frequent use of the kneeling posture in their religious observances: those employments which demand much bodily exertion dispose to hernia; certain urinary diseases, in which the patient is obliged to make considerable efforts to expel the urine, may cause hernia, but, what does not commonly happen under other causes, if you cure the urinary disease, you will be able to cure the rupture by three or four months steady application of a truss. Riding uneasy horses is a frequent cause of hernia, and this is shown by military returns. The number of cavalry soldiers who get rupture is two to one of the infantry: playing wind instruments sometimes causes it—in fact, anything that gives sudden shocks to the frame, or which demands great physical exertion, so as to increase the compression on the contents of the abdomen to a violent extent, is likely to cause hernia.

In some cases hernia is instantly formed, as by a sudden and violent exertion, such as leaping from a height, but in others the progress of its formation is imperceptible. A gentleman will tell you, that every time he mounts his horse he feels an uneasiness in one of his groins, but that while he remains quiet he feels nothing there, and he will come to you perhaps several times telling you the same thing, and yet never once allude to a swelling there; in other cases, there may be a little uneasiness in the groin, the patient is in the habit of feeling it, yet he is not conscious of what is going on, so very gradual is its progress, and in three or four months the hernia will be very apparent. This chronic form is of the reducible kind, but the

majority of those formed suddenly are irreducible, and often strangulated.* Reducible hernia, after a longer or shorter period, is very liable to become irreducible, but without any change in the patient's feel in the part. The sac of a hernia is, you know, formed of the peritoneum, yet if the affection has existed a long time, this thin delicate membrane is so altered that you would never suppose, on a cursory glance, that it could have had such an origin. I have seen an old hernial sac as thick as the strongest part of the fascia lata; but on a careful dissection of its structure, you will find that the peritoneal surface itself is not thickened; the deposition is in its outer layer, which in fact is only the cellular membrane by which it had been connected to the neighbouring parts; the true peritoneum is only rendered opaque. In old herniæ in which there is omentum, this membrane undergoes a very remarkable change—it becomes loaded with fat, and has sometimes a fleshy appearance.

In the adult male the most common seat of hernia is in connection with the abdominal rings—what is called inguinal hernia. Women are more subject to femoral hernia; but they are also affected with umbilical hernia, particularly if they have borne many children. The exact situation of what are called the abdominal rings must be accurately known by you, both to understand and to relieve these cases. The internal ring is formed in the fascia transversalis, and transmits

* A pupil of mine, reading one night on hernia, put down his hand to feel the situation of certain anatomical points in the groin, and discovered that he had a pretty large inguinal hernia, of which, until then, he had not the slightest suspicion. I have known an incident of nearly the same kind occur to a medical gentleman in this city.
—*Ed. of Lect.*

the spermatic cord, or, in the female, the round ligament of the uterus, from the abdomen ; it is not a fair round aperture, but is prolonged for some way around the cord in the inguinal canal. This ring is situated midway between the anterior superior spinous process of the ilium, and the symphysis pubis, and about half an inch above the level of Poupart's ligament ; it is not always *exactly* in this spot, but in the natural state it is never many lines to one side or the other of it. The external abdominal ring lies external and superior to the spinous process of the pubis, and is formed in the tendon of the external oblique muscle ; the space between these rings is called the *inguinal channel*, in which the spermatic cord lies. You know the cremaster muscle, coming from the lower border of the internal oblique and transversalis abdominis muscles, accompanies the cord through this channel also, lying in front and a little external to it, and you will remember, this muscle and the cord are very loosely attached to each other by reticular cellular membrane. You will see, then, from your knowledge of the anatomy of those parts, the contrivance manifested to protect against the occurrence of hernia here : the gut or omentum, which first pushes through the internal ring, meets a resistance to its direct course from the internal oblique and transversalis muscles, the lower borders of which overlap it, particularly the former one : and that the resistance they give to protrusion is strengthened by the aponeurotic-like tendon of the external oblique muscle ; the hernia has therefore to make a turn downwards and inwards into the inguinal channel or groove, towards the external ring. At this external ring it meets a new obstruction from the transverse bands which bind the sides or pillars of the ring to each other, and this obstruction may suc-

ceed for a long time in preventing the passage of the hernia through it.*

* The anatomy of inguinal hernia presents little difficulty to the student who investigates it with the knife and forceps in his hand, if he does not hurry himself; while to him who reads the descriptions of the same parts by different authors, the difficulties are almost insurmountable, from a want of methodical language, and the ambition of applying new names to things already well supplied. For instance, the line that separates the abdomen from the thigh, is called Poupart's ligament—the ligament of Fallopius or Fallopio—the crural ligament—the femoral ligament—the ilio-pubic ligament—the external inguinal ligament—the crural arch—the inferior border of the external oblique muscle—the femoral arch, &c., &c. Then comes the inextricable confusion in the terms employed to describe the relative positions of parts, which has a more dangerous tendency—for instance, the adjectives *internal* and *external* are applied to the apertures by which herniæ escape from the abdomen, or the Rings. Now, that which is called the *internal* ring, is what the scalpel makes in the fascia transversalis, when it is required to *exhibit* a ring, and which is situated sixteen or eighteen lines more external to the median line than that which is called the external ring, or the triangular deficiency in the tendon of the oblique muscle. He who uses this mode of description writes, that the epigastric artery lies to the *internal* side of the *internal* ring, which is a contradiction in terms. The same may be said of calling the curved pillar of what is called the *external* ring, that on which the spermatic cord lies, the *outer* pillar, if considered in connection with the terms employed to the rings themselves. Again, Hesselback and others call the common oblique hernia *external* hernia, although it *may* have passed *only* through their internal ring, and give the name *internal* hernia to that which has only passed through the external ring, without any connection with the internal ring at all; that is, the *hernia by direct descent*, or the ventro-inguinal of others. These few instances are given as a warning to the student against the multitude of similar perplexities he will encounter in *reading*. To my mind, one of the most simple and satisfactory descriptions of the anatomy of hernia, is that of Mr. Colles in his "*Surgical Anatomy*."—*Ed. of Lect.*

You can understand therefore that an inguinal hernia may exist, although the parts have not protruded through the external ring, and this you must constantly keep in mind when making an examination for this disease ; you are not to be satisfied, when there does not appear a swelling at the external ring, but observe whether there be not an elongated and oblique fulness in the space between the two rings, or a little tumour, not well defined perhaps, situated midway between the spine of the ilium and symphysis of the pubis ; for recollect a patient may lose his life from his hernia becoming strangulated in the internal ring.

From various circumstances that may arise and changes that may take place, particularly the thickening of the surrounding parts, it is sometimes difficult to distinguish inguinal hernia from other diseases. The spermatic veins are very numerous on the cord, and are subject to varix, as other veins are. Now, when they become affected with this disease, they form a considerable swelling, and from their situation, and the feel they communicate to the hand, they very closely simulate omental hernia. Like the Epiplocele, the tumour of Cirsocele, as this varicose condition of the spermatic veins is called, is irregular on its surface ; it is inelastic ; it yields slowly to the pressure of the hand to return it into the abdomen, and it gives somewhat the sensation to the examiner as if it was increased in size by coughing, &c. : it can be reduced in the horizontal position, and may not reappear until the patient stands up : these points of resemblance between the two diseases may lead to error in judgment, and should a truss be recommended and applied when the case is cirsocele, of course it would do injury instead of service. The best way

to distinguish one from the other is that pointed out by Sir A. Cooper: put the patient in the horizontal position, and reduce the tumour, then place your fingers firmly on the external ring and make the man stand up. If it be hernia, it cannot return, in consequence of the pressure you make, but if it be a varicose state of the spermatic veins, the tumefaction will return, and the more readily the stronger the pressure you make. This will never fail to distinguish between the two cases. Inguinal hernia may be confounded with hydrocele of the spermatic cord, in cases where the fluid extends up as high as the external ring, or where it even goes through the ring and into the cavity of the abdomen, as it sometimes does, or only as far as the internal ring. To distinguish these two cases, you push up the fluid a little way into the abdomen, when that is possible, having first made the patient lie down; you then take hold of the spermatic cord between your fingers below the fulness, and hold it so tight that you are certain a piece of gut could not slip down between your fingers, then make the patient rise, and if it be hernia the tumour will not reappear, but if hydrocele it will, let you do your best to prevent it. I have succeeded in detecting several of these cases, by this mode, not merely in adults but even in children, and to tell whether an infant has hernia or not, is one of the most difficult things in the world. The points of similarity between hernia and this form of hydrocele are very strong: both are generally in front of the spermatic cord; in both the testicle is below the tumour. Now, to distinguish them, you are told to hold a lighted candle on one side of the tumour, and to throw your eye upon the other, and that if the case be water the tumour will be transparent, and you can readily

detect it. This proceeding was never recommended by a practical man; for the convexity of the tumour alone will give the perfectly deceptive look of transparency, no matter how opaque it really may be, and if this is difficult in the adult, it is ten times more so in the child. You will often require great caution in your diagnosis of these cases, for if, suppose, a man in the army fancies he has rupture, and that you erroneously agree with him, he is considered unfit for service, and your wrong decision may oblige him to give up his commission. There is a honey-comb hydrocele of the cord, where the water is contained in a number of cells that have a slight communication with each other, just sufficient to allow a little dribbling of fluid from one cell to the other : this cannot be mistaken for enterocele, but it may for epiplocele, but the same test will answer here as for the other case. An irreducible hernia may be mistaken for hydrocele of the tunica vaginalis testis, but this hydrocele seldom goes up so far as the external ring; sometimes, however, it does go through the external, and as far as the internal ring; you can, in such cases, generally get your finger into the ring, which you could not do if it was hernia; sometimes water accumulates in the bottom of a hernial sac, and if the hernia be irreducible nothing can be more difficult than the detection of the real nature of the case. I have seen three surgeons in Dublin who saw more cases of hydrocele than all the other surgeons put together, mistaken in such a case as this, and they actually went about operating for hydrocele. You will understand the difficulties of this by recollecting the ordinary course of an inguinal hernia. When it gets first through the internal abdominal ring, it is covered immediately in front by the transversalis abdominalis muscle, and about a

quarter or half an inch lower down by the internal oblique: on descending below the margins of these, it becomes covered by the cremaster muscle. Now, you recollect that the vas deferens and spermatic vessels must naturally lie behind the hernia so far, and as it continues to descend to the external ring, or down into the scrotum, it separates the muscle from the rest of the cord in its whole extent; but when it comes to where the cremaster is firmly connected to the tunica vaginalis testis, it is held in a kind of loop, and can descend no lower without carrying the testicle itself down with it, so that in oblique inguinal hernia the testicle can be felt distinctly at the bottom of the tumour; but if the tunica vaginalis is distended with the fluid of hydrocele, which, remember, is an adventitious complication, and not at all depending on the hernia, the feel of the testicle will be very obscure, or you may not be able to discover it at all.

Where a tumour of any kind forms in those situations where herniæ usually appear, and becomes fixed, it may readily be confounded with hernia, and if in a state of acute inflammation, symptoms may present themselves very difficult to be distinguished from those accompanying the strangulated condition of a hernia. There is a small lymphatic gland always, I believe, to be found on the pubic side of the internal abdominal ring, and very close to it, and I have seen a swelling and inflammation of this gland give a great deal of pain, attended with nausea and obstinately constipated bowels; there are other lymphatic glands found here and there along the whole course a hernia would take, that might lead one into error when similarly affected. In femoral hernia the distinction will in many cases be even more difficult, from the smallness of the tumour frequently, and its greater depth from

the surface in both. Swelling of the testicle from gonorrhœa, or a varicose condition of the spermatic veins, *when combined* with hernia, is the most difficult thing in the world to detect the nature of. To examine if a man has hernia, we bid him stand up, and desire him to cough, we cast an eye, not on the external ring, but on the situation of the internal ring, and if he has a hernia, we will see an oblique tumour in the direction of the canal.*

As the difficulty of reducing a hernia by the *taxis* depends mainly on the tightness with which it is girt by the edges of the openings through which it has protruded, your first step must be to put your patient into such a position as will relax these parts as much as possible. You know that much of the tension of Poupart's ligament depends on its attachment to the *fascia lata* of the thigh; when the limb is extended this ligament is drawn downwards and made rigid, and to relax it, and through it, the external abdominal ring, you flex the thigh on the pelvis, and turn the knee inwards; you also relax the abdominal muscles by raising the pati-

* This observation obviously is applicable only to *oblique* inguinal hernia, for, if the case be that comparatively rare one, ventro-inguinal, there can be no tumefaction in the direction of the inguinal canal; this form of the disease having no connection with the internal abdominal ring, or with the canal, except at its very termination. As elsewhere, Dr. Colles gives the excellent practical advice to apply the pad of a truss over the *internal* ring, instead of where it is more commonly applied, on the external. It is hardly necessary to observe that a case of *direct* inguinal hernia will be an exception to the rule, and so, perhaps, will the old hernia that has caused an approximation of the rings, so far as applying the pad to the midspace between the spine of the ilium and symphysis pubis.—*Ed. of Lect.*

ent's shoulders by pillows, &c. ; you then have the parts disposed in the best manner to favour your purpose ; you next grasp the hernia with one hand and compress it gently, while with the fingers of the other hand you lay hold of the part immediately below the ring, and endeavour to press a little of it backwards through the ring, and upwards and outwards in the direction of the inguinal channel. If you get up ever so little, you will generally, by perseverance, get up the remainder. If the contents of the hernia be intestine, it generally goes up with a gurgling noise, and the last portion springs from your fingers, as it were, into the abdomen ; while, if it is an omental hernia, it goes up slower, without noise, and you have to follow the last bit of it with your finger. Now, after the hernia is reduced, the next thing we have to do is to prevent its return, and this is done by means of a truss, of which I have here specimens of different constructions. Although I think the common truss will in general answer better than any other, you seldom get them properly made in the shops. Besides the comfort a patient enjoys from having his rupture kept up, and besides the danger he otherwise would be liable to from blows and other accidents, and the risk of its one time or other becoming strangulated from any imprudence on the patient's part, or even when he had nothing to accuse himself of, and those would be sufficient reasons of themselves, there is yet another for employing a truss with care and constancy—namely, the hope of eventually procuring a permanent cure of the disease ; and this may be rationally entertained if the complaint be not of long standing. If, by the pressure of the truss, we excite a slight inflammation of the neck of the hernial sac, the sides of it may adhere, the adhesion will grow

stronger every day, and finally be sufficient to resist a future descent of the hernia.

Now, I wish to impress on you particularly, that to adopt the surest means for so desirable an end, it will be necessary to apply the pad of the truss over the internal ring; it will be of no use whatever to place it over the external ring, as the old surgeons used to do; it could only limit the extent to which the hernia would have descended, but could not press on the *neck* of the sac which is at the internal ring, and of course will not have the chance of curing the disease; besides the pad, if applied over the external ring, will press on the spine of the pubis, on the spermatic cord if the patient tries to bear the pain, and in either case the pressure will be borne off the parts we wish to act on. I saw a man who lived in the country, and who got a truss made there with the strongest spring they could manufacture—and it was a strong one indeed—and this he wore for a long time, but he was sometimes obliged to lie down in the field and to loosen it, from the pain it gave him, by pressing on the cord, and on examining this man I found he had no hernia at all, nor ever had. You ought to be very particular in your directions to the patient how to put on his truss; unless you do, they are often quite content to get the tumour up out of the scrotum and then apply the truss, but it may, in such a case, press on the gut itself as it lies in the inguinal canal. After he has worn it two or three days make him come to you, and see him put the truss on before you that you may be certain he does it right; if it excoriates him make him wash the part three times a day with cold vinegar and spirits, and apply a bit of shamois leather under the pad. If he is to obtain a perfect cure he must positively wear the truss day

and night for twelve months at least. It would be well to make him have two trusses to wear alternately every three or four days ; the pads will be more comfortable, and wearing one constantly, I suspect, injures the spring.

LECTURE XVIII.

HERNIA, CONTINUED — VENTRO-INGUINAL — IRREDUCIBLE HERNIA—STRANGULATED HERNIA.

THERE are trusses invented to enable the patient to regulate the position and degree of pressure himself, but I believe most people prefer the common one. There is one thing you must look well to. You can hardly get the truss-makers to make the spring short enough for the pad to rest over the internal ring; they are a very self-sufficient class of people, and of course in things of this kind totally ignorant, and so wedded are they to old errors, that they actually will not make the instrument as you desire.* The com-

* There was lately laid before the Council of the Surgical Society of Ireland for their opinion, a truss invented by Surgeon L'Estrange of this city, specially designed to press on the internal ring, and the whole inguinal channel. It consists of two springs, independent of each other in their action, and pressing in contrary directions. We were unanimous in our opinion that its construction was well adapted to fulfil the intentions of the inventor, in any position of the body, which the common trusses hardly ever do. Mr. L'Estrange did me the favour, on a subsequent occasion, to show me a case where his truss had been worn several months, and the person, who took a good deal of exercise on horseback, had no occasion to wear a thigh-strap or other contrivance to prevent displacement, and so well had it performed, that I think a cure had been effected. For description and figure of Mr. L'Estrange's instrument, see *MEDICAL PRESS* for February 21, 1844.—*Ed. of Lect.*

mon pad is of no use to very fat people; you must have a very large pad for them, and it should come to a point in the centre. Should the truss press on the cord, you can get a groove cut in it for the cord to lie in, although inconvenience of this kind rarely happens, unless there be some morbid affection of it. The irregular application of a truss is very dangerous; I operated on a student of this class, in whom the necessity for the operation arose from his using his truss irregularly.

There is a form of inguinal hernia called *Ventro-inguinal* or *Direct Hernia*, in which the protruded parts take a different direction from the ordinary oblique hernia, and of course have a different relation with the surrounding structures. We saw that the common case we have been considering, came first through the internal abdominal ring; that it next passed under the fleshy margin of the internal oblique and transversalis muscles; that it coursed along the inguinal canal, and at length generally pushed its way out through the external ring. Now, as it first emerges from the abdomen, it will have the epigastric artery on its pubic side; this artery runs within a very short distance of the inner margin of the internal ring, only separated from it by a small lymphatic gland, and, perhaps, a small vein; the hernia is next pressed on by border of the transversalis muscle, and a little lower down by that of the internal oblique; that in passing those it becomes connected with the cremaster muscle, which lies on its anterior and superior part, the hernia in its progress separating that muscle from the spermatic cord, which latter lies behind and below it; that it rests then on Gimbernat's ligament, which conducts it to its termination. Now, if you recur to your recollection of the anatomy of

these parts, you know that there is no passage from the external ring directly backwards into the abdomen; that your finger meets a resistance in that direction; and that, carefully examined, this resistance is found to be caused by the conjoined tendons of the internal oblique and transversalis muscles going to be inserted into the os pubis, and by the fascia transversalis which is inseparably connected with this common tendon. You find also between the inner pillar of the ring and the conjoined tendon, a fibrous structure of a triangular shape, having one of its sides inserted into the *linea ilio pectinea*, another side apparently lost in the external oblique muscle of the opposite side, and the third, which is free, having a well-defined semilunar edge looking upwards and outwards. This *triangular ligament* stretches itself more or less completely across the space behind the external abdominal ring. These parts, except the last, are far from being strong—in fact, the back of the external ring is the weakest point, in reference to hernia, in the whole inguinal region, and accordingly we sometimes find the intestine has burst through the tendon and fascia, and comes forward at once through the external ring. Now, you will readily conceive the difference of its relation from that of the other form. It will have the epigastric artery of course on its iliac side, and at some distance from it; it will have the cremaster muscle and spermatic cord most probably behind it, for it glides over and in front of these parts in its passage out. We shall presently see what importance is attached to these differences, when we come to the operation for strangulated hernia. Now, in cases of long standing, and where the protrusion is large, a change takes place in the position of the oblique hernia that gives it very much the general characters of this di-

rect kind—the internal ring is gradually drawn down by the weight of the contents of the sac, until it is nearly opposite the external ring, and the groove or channel I before mentioned as containing the cord, which, in the natural state, or in the recent small hernia, is an inch and half long, has by this means been reduced to almost nothing; yet the epigastric artery and cremaster muscle will have very little altered their relative positions to the hernia itself. Of course I need hardly repeat that the proper hernial sac in both these forms is composed of that part of the parietal peritoneum which stood in the way of their protrusion at the groin, and which they had carried forward with them.

A hernia is said to be irreducible when all the efforts of the surgeon are insufficient to restore the bowels or omentum to their proper situation. Although not strangulated, yet a man having such a hernia is far from being free from danger. It is liable to serious injury from a degree of external violence that, under other circumstances, would not obtain a moment's notice. It is liable to become inflamed, and to obstruction.

What is it that makes a hernia irreducible? Sometimes it is a slight adhesion of the neck of the sac, arising from a slow chronic inflammation, and so slight in degree as not to be felt by the patient; such a hernia may sometimes cause pains like colic, or an uneasy feel in the testicle with which it is in contact. Sometimes a hernia is rendered irreducible by a band formed of coagulable lymph embracing the neck of the sac, and this is likewise caused by the same kind of chronic inflammation. When a hernia is first protruded, the sac is quite moveable, and can be returned with its contents into the abdomen, but when

the disease has existed a month, the sac becomes adherent, and will never go up again. A hernia may sometimes become irreducible from its increased bulk, arising from an accumulation of fat in the mesentery, and also from a change in its structure. For two or three months after the occurrence of an omental hernia, the omentum is not much altered, but after that period it becomes, as I have said, a mass of fat, loses entirely its natural appearance, and gets such an increase of volume that it cannot afterwards be reduced. The omentum or intestine may also have formed adhesions to the irreducible sac in which they are contained, and so become irreducible themselves; and this adhesion between the sac and its contents will sometimes be found so extensive and firm, that you are unable to separate them with safety, even when they are exposed in the operation.

Sometimes a patient having a hernia for a long time without any trouble, feels, after making some exertion, a new portion come down, and immediately it becomes irreducible; if we try to bring that hernia to its former state what we should do is this—we must make the patient lie in bed, not for three or four hours, but for eight or ten days successively, we give him one or two smart doses of purgative medicine, but not more, for if you continue brisk purging you will cause a disengagement of air that will increase the bulk of the hernia, and render its reduction more difficult; keep him moderately open, and on diet not likely to produce flatulency; should this not succeed, you must continue the purges still longer, and of course the frequent employment of the taxis. Great cold applied to the scrotum, by causing its gradual and firm contraction, will sometimes effect the reduction of the hernia. Cold also reduces the vo-

lume of the hernia, and by this means assists your efforts. If the hernia has been of long standing, and the ring wide, you may use a considerable force in your trial of the taxis, or manual return of the hernia. Those about you may cry out that you will burst the intestine with the force you exert, but you need not fear. The case is this—the sac has become so thickened, and takes off the pressure from its contents so much, that you really must use a considerable degree of force before you can act on the hernia at all. But you cannot use this force in all cases. In a case which has existed, suppose, only a month, you must use less force, because the pressure is more directly applied to, and acts more immediately on, the contents of the sac. In the old case, should you not succeed in returning the hernia by the means I have mentioned, you should make use of an exceedingly good contrivance invented by Sir A. Cooper; it is a laced suspensory bandage, so contrived that you are able every day to tighten it a little, and the gradually increased pressure, and your power to make that pressure follow, as it were, the diminution of the tumour will often crown your efforts with success. Now, an old rupture of *very* large size will not admit of any means being employed to reduce it; the abdomen has become accustomed to the diminished quantity of its contents, and even if you should succeed in returning a large volume of intestine and omentum, you would speedily have, in many instances, to allow them again to descend, on account of the disturbance of the system from nausea, vomiting, colic, &c., and even where the laced bag might be properly tried, you will have to guard against tightening it too quickly, lest these consequences should be produced. When you give up all

hopes of returning one of these large herniæ, all you have to do is to advise your patient to avoid flatulent food, particularly young vegetables. It is remarkable that numbers of herniæ became strangulated at the season of the year when the young vegetables come in first : this I have remarked for years. You must not suppose that some extraordinary exertion on the part of the patient is necessary to make an old hernia become strangulated—not at all. The young student I before mentioned, on whom I operated, had his hernia for some time without experiencing any inconvenience from it ; and while he was sitting quietly at a card-table, he felt it uneasy ; he put down his hand and felt it enlarged ; it had become strangulated.

When a hernia becomes strangulated, the patient feels a little sickish ; he takes, perhaps, some medicine, but is not relieved by it, but after a little time there comes an uneasiness in the tumour, and this quickly becomes very painful. On examination you will find the contents of the sac inflamed, and yet the integuments over this inflamed hernia do not often become discoloured or inflamed : sometimes, however, they do ; the patient's stomach next gets from nausea to vomiting ; there is very great thirst ; the vomiting becomes more frequent ; the abdomen becomes full and tense ; the pulse from the natural state becomes small, hard, reduced, and rather quick ; the patient's eyelids overhang his eyes ; he tosses his legs about ; he at length vomits *without any effort*, without raising his head sometimes, he just opens his mouth, and out it comes : his extremities become cold ; a cold sweat breaks out on his face ; he has a stool, and gets perfect relief from all his distress : he says he feels quite well, quite easy, but you know he is not well, for mortification has taken place, and in a few hours he

expires. Now, a patient sometimes dies of strangulated hernia without gangrene at all taking place ; he dies of peritoneal inflammation.

The more recent a hernia is, the more rapidly does it become fatal ; but an old case *where a truss has been irregularly applied*, is as dangerous and as rapidly fatal as a case which appeared but the morning before. The periods at which strangulated herniæ become fatal are different under different circumstances : sometimes in twenty-four hours, and sometimes not for five or six days. I cannot charge my memory with having ever seen a case of inguinal hernia recover when gangrene had taken place, yet it is very remarkable that patients with strangulated *femoral* hernia that had mortified, will often recover, although the parts which constrict the intestine are much more rigid and unyielding, have sharper edges, and form a smaller aperture in the latter than in the former.

There are some means by the employment of which you will be able, occasionally, to relieve a strangulated hernia without the operation, and they should in most cases be tried before having recourse to the knife. You should begin in these cases by bleeding the patient, not merely for the purpose of making him faint, although that is of the first importance, but likewise to reduce or moderate inflammation. I never saw a recent strangulated hernia where bleeding was not necessary. Cases, apparently very similar, will end differently, so that if your patient, whom you have bled in the first instance, should afterwards die, you are not to think that it was the bleeding which killed him : you must never judge from one or two of such cases. My advice to you is, never to let a case of strangulated hernia come across you without having

recourse to bleeding, and this should be carried to fainting: take blood in a full stream, and from an orifice so large that you would almost be afraid to make such a one in a vein. When you make your patient faint you will often be able to return the hernia. The warm bath is advised, and is sometimes useful: but as the only intention in using it is to make the patient faint, you must make it as hot as he can bear it comfortably, but no hotter. Purgatives should never be given in recent strangulated hernia by the mouth; purgative clysters may be of service, by relieving the fulness of the large intestines, and relieving the tension, but you need not persevere in them, for, after the first or second injection, they cease to give relief. Tobacco injections are the very best things after bleeding. Formerly the smoke of tobacco was used for this purpose, but the objections to it were—the difficulty there often was to get the machine to work well, and the distension it caused was very distressing; the infusion is therefore now substituted: you get a drachm of tobacco leaves and infuse it for ten or fifteen minutes in a pint of boiling water; when cool inject one half, and if in a quarter of an hour you observe no effect from it on the system, inject the other: the effect you look for is fainting, depression, cold perspiration, &c. I have seen many cases where the surgeon persevered for a considerable time to try to put up the hernia by the taxis, without success, and which went up of its own accord after the tobacco enema. Warm applications are objected to on the ground of their increasing the volume of the hernia. Now, I believe warm applications do very little good or harm; but as to their rarifying the air in the protruded bowel, I believe that neither warm or cold applications can have any effect whatever on the con-

tained air. Take care how you apply too great a degree of cold, or for too long a time to the scrotum when it is inflamed, and its colour purplish, or when the bowels are down two or three days, for the vitality of the parts is reduced, and you might bring on gangrene. I have heard that dashing a bucket of cold water over the patient, without giving him notice of your intention, has succeeded in getting up a strangulated hernia. Petit tells a story that he had such a case, where he saw nothing that could be done except to operate, and pressed the boy's friends to let him perform it, but the patient's mother would not consent, and while they were arguing, she got a tub of cold water, dashed it over the boy, and the hernia went up of itself. I have seen taking up the patient by the heels, and holding him by them for a short time, succeed in getting up a hernia when nothing else would ; but it is a practice by which, if you fail, you will be likely to get into disgrace.

If everything you try fails in reducing the strangulated hernia, what are the symptoms that would warn you not to delay the operation—at what period should you operate? Why, some will tell you that you may wait, that there are certain symptoms which will distinctly point out when you must have recourse to the knife, and until they show themselves, you may employ yourself in trying other things ; but authors differ about what these certain symptoms are. One will say—"Wait until the patient gets hiccough ;" but he may die, and I have seen patients die of strangulated hernia without ever having had hiccough at all. Others say—"Wait until you discover symptoms of peritoneal inflammation, until the belly gets tender, &c.:" but just think of the hazard you put your patient in, by waiting until you get decided symptoms

of peritonitis developed in your patient : in fact, you have no symptoms to show precisely when you should or should not perform the operation for strangulated hernia : you will acquire, by habit, a certain information through the feel of a hernia, by which you know whether you have any chance of getting up the hernia or not, by which you can almost always say with certainty whether the taxis will at all succeed or not. One thing is certain, the result of the French rule of operating within twenty-four hours after its occurrence, is infinitely more successful than ours who wait longer : if the operation is necessary, the sooner it is done the better.

I mentioned that the course of a hernia when strangulated is very variable : one half of those cases only take as many hours to run their course, as the other half would days, before mischief occurs. How is this to be accounted for ? Some say—" If a piece of omentum be down with the gut, it will, as it were, cushion off the sharp constriction on it, and there will be less urgency in the symptoms." Sir C. Bell says the reason one case will run a slower course than another is, that where there is no *foeces* in the bowel, it will secrete a superabundance of mucus, the distension of which will cause all the uneasy symptoms ; and he, out of this supposition, draws a distinction between strangulation and incarceration : but a hernia will be strangulated, and be subject to all the consequences of that state without any increase whatever in its size, and we really do not know why this is so. I think it is better to consider all those as cases of strangulation, as Bell does not give us any symptoms to enable us to distinguish between strangulation and incarceration, to guide our practice ; I think he wrote on this subject from observation on one case only. I said there

was a particular feel in the tumour, by which you could tell whether the taxis would succeed at any period or not: it is hard to convey an idea of this feel: you will feel many herniæ before you learn it; it is a certain degree of unyieldingness and incompressibility conveyed to the hand. Where there is tenderness to the touch you should not use force in applying the taxis. I have seen an instance where a surgeon used force in the reduction of an inflamed hernia, and he reduced the tumour sure enough, but on examination after death, it was found that he had ruptured the bowels.

We shall now consider a hernia of long standing. If these are strangulated they become in all respects like recent ones, as far as ultimate consequences are concerned; but there are many points of difference between them in other respects. A very recent hernia, if promptly returned, may, as I said before, be radically cured, but an old hernia never can, because, among other reasons, the parts through which they have protruded, have become so widened, and the passage from the abdomen so free and direct, that there is no chance whatever of restoring them to their natural capacity, or of procuring such an adhesion of the neck of the sac as would prevent any future descent. For this reason, too, it is that the symptoms following strangulation of old herniæ never follow each other so rapidly as they generally do in a recent small hernia; they are slower in their progress.

If you procure a stool in a recent hernia, it is just what had been in the rectum or neighbouring part of the colon; but in the old case you may be able to procure stools from a more distant source. In the recent case you have seldom much time to spare for the trial of the taxis, or the employment of other

measures before the ultimate one of operation : in the old case you may wait even a week in many instances, and during that time throw up repeated enemata, and practise the taxis ; you may also administer purgative medicines by the mouth ; although the patient is vomiting, and has not passed a regular stool for two or three days, a calomel purge will often bring away a stool, and where it does so, the hernia will be likely to go up. In giving purgatives by the mouth in those cases of old herniæ which have become strangulated, you should make choice of those not of a very irritating description ; calomel and aloes, or calomel alone, or sulphate of magnesia, will answer very well ; if the pill of calomel and aloes, or calomel alone, does not lie well on the stomach, you might combine a little opium with it. The reason that purgatives are proper, and often do service in those cases of old herniæ is, that from the large size and long existence of the hernia, and consequent openness of the rings, the bowels have room to perform the peristaltic motion, which would be next to impossible in the small recent case. Although the abdomen may become swollen, it is not so painful as it is in the recent case. Your application of the taxis will be very different in the old hernia—in fact, here you may use as much force as you like ; I have risen, after reducing one of them, as tired as if I had made the most violent exertions. You are perfectly safe in any degree of force you employ with the hand in reducing one of these old cases, and if you succeed in getting up ever so small a bit, you relieve the urgent symptoms. It is not at all necessary to reduce the *whole* of the protruded parts in an old hernia ; it is quite enough if you reduce the portion that last came down, what would, in your estimation, amount to perhaps an inch of intestine. In

these old herniæ the remarkable change takes place in the position of the rings that I before mentioned ; you will, therefore, in reducing such a one, push the contents of the sac directly backwards, instead of upwards and outwards, as in the recent cases. An omental hernia, when strangulated, will produce as much constipation as if a piece of intestine were included in the stricture, and, when we come to examine the case, we cannot say whether a piece of gut be there or not ; a very small bit may be recently pushed down into the sac of an old omental hernia, and neither from the size or thickness of the parts, or by any other means, can we discover it ; you must not therefore rely much on the previous information you may have gained in attendance on the case.

There is a kind of hernia, the diagnosis of which is very difficult—it is when the bowels have passed through the internal ring, and lie in the inguinal canal, without having quite reached the external ring, although it has approached it ; if one of the patient's testicles should never have descended into the scrotum, but remains in the inguinal canal, and that this testicle gets inflamed from any injury, it gives precisely the symptoms of strangulated hernia ; I would defy any one to tell the difference between them. Now, if you proceed to operate in this case, under the impression that it is hernia, you will perform an operation that will be very likely to be fatal to the patient ; merely exposing the testicle in this situation is almost always fatal. I recollect I once went to perform an operation of this kind, and did perform it, without ever thinking whether the man had a scrotum at all or not ; I found the symptoms arose from an inflamed testicle in the canal ; the man died, and the case left an impression on my mind that I will not readily

forget. Inflammation of the testicle here is infinitely more violent than it ever is in the scrotum, and when it is exposed, the patient dies of peritoneal inflammation. When a hernia is strangulated in the inguinal canal, the symptoms are very rapid, and it is very difficult to apply the taxis to it with effect, because you cannot get your fingers round it.

LECTURE XIX.

HERNIA, CONTINUED—HERNIA CONGENITA —HERNIA
INFANTILIS—OPERATION FOR INGUINAL HERNIA.

THERE is one species of hernia which I omitted to mention—namely, *Congenital Hernia*. For some time after the testicle has descended from the abdomen of the child in utero into the scrotum, there is, you are aware, a free communication between the cavity of the tunica vaginalis and that of the belly. Should a portion of intestine insinuate itself down into the peritoneal canal that connects these cavities to each other, before the communication is closed up, it will prevent the closure, and the infant will have this congenital hernia. In this case the hernia is in contact with the naked testicle, and lies in the tunica vaginalis testis, which forms its sac ; its relation to the cord and cremaster muscle does not differ from that of the common inguinal hernia, except that it is separated from the muscle by the tunica vaginalis of the cord and testicle. As in this form of the disease there is nothing to prevent the gut from descending as low as the body of the testicle, or even a little below it, you will not, as in the ordinary case, feel the gland distinctly below the hernia, nor indeed is it in this form to be very distinctly felt at all. I never was at the pains to observe the proportion of cases, where this communication between the bag of the tunica vaginalis and the general cavity of the peritoneum remained open at birth, but I think it is open at least on one

side in every infant when born. We often discover adhesions formed between the testicle and a neighbouring intestine while these parts lie in the abdomen, and in such an instance as this, we cannot prevent the occurrence of hernia, nor prevent its continuance. This kind of hernia may occur in the adult.

How are we to know whether an infant has or has not a congenital hernia? It is very curious, but true, that the surgeon often takes the word of an old nurse-tender, or other ignorant person, that the child has a rupture, and applies his treatment for it, when there exists, perhaps, only a hydrocele extending up to, or through the ring. A great proportion of cases in infants which appear to be hernia, are really only a collection of fluid in the tunica vaginalis of the testicle and cord. From the restlessness of the child, and other circumstances connected with its age, it is sometimes difficult to decide on the presence of hernia in them. The way I would propose to examine it is this: place the infant in the recumbent position, and push the tumour up into the abdomen, (if it is a hydrocele you can always do this in an infant)—then take hold of the spermatic cord in your fingers, and hold it just so tight as to prevent a hernia, if there be one, from descending—then place the child erect, and in a few minutes, if the case was hydrocele, the tumour will reappear; of course if it be hernia it will not. I have never known this test fail in showing the true nature of the case. Now, suppose the case to have been a hernia, and that in returning it you find you have likewise returned the testicle back into the abdomen with it—that they are adherent, and that wherever one is, there must be the other, what are you to do? Are you to keep the testicle in the abdomen, or subject the child to the danger of

leaving the hernia unreduced ? Why, the best thing you can do is to explain the whole matter to the child's parents or friends, and if they permit it, by all means keep up the testicle, although the future man may feel himself uncomfortable at finding that he has but one testicle apparent. How are you afterwards to keep up the hernia ? You will find it difficult to make those who have the care of the child persevere in keeping on a Truss properly. The child will wet it, the leather in two or three days will become hard, and the spring of the truss rusted, and thus will it become perfectly useless ; what I would advise you is, to get a cover for it of oiled silk, that will slip easily over it, and by having two or three of them they can be changed occasionally, and all the inconveniences be remedied ; linen bandages or covers are obviously useless. With all your care, your great difficulty will be to get the child's nurse to follow your directions strictly and perseveringly ; they think everything is wrong if the child cries.

Mr. Hey describes another form of Inguinal Hernia which differs from that I have just mentioned, although it also, in a great measure, is especially connected with infancy. It sometimes happens that the communication between the abdomen and tunica vaginalis, is closed up in the ordinary way at the internal abdominal ring, but the adhesion does not extend farther, and the bag of the tunica vaginalis testis may be said to extend from the scrotum up through the external ring, and inguinal canal, as far as the cicatrix at the internal ring. Now, a hernia may occur in this condition of the parts,—will carry before it the cicatrix, and consequently a peritoneal sac, and take its course in the tunica vaginalis of the cord, down into that of the testicle, of which it is a continuation. Here the

hernia may be said to have two sacs—one, the process of peritoneum, similar to the sac of a common hernia, and which it had pushed before it, and the other, the tunica vaginalis itself, which contains the hernia and its true sac. This form of rupture is called *Hernia Infantilis* in contra-distinction to the hernia congenita, which has no proper sac, but is contained in the tunica vaginalis, and lies in contact with the testicle. It is a very rare form of hernia, and cannot, I think, be distinguished from hernia congenita during life. Its ordinary treatment will be the same, but if an operation be required, you must not forget, that after opening the tunica vaginalis, the hernia is not exposed, for you have still to open a proper hernial sac which is contained in it.

The operation for inguinal hernia has for its object the division of the constricting part or parts, either to enable us to return the protruded parts, or if that be impossible or imprudent, to remove the obstruction to the exercise of the functions of the bowel, or should the case be omental, to take off such constriction as may endanger its vitality, or the still greater danger of its inflammation extending to the peritoneal surface within the abdomen. Our first consideration, then, is—in what places, or by what parts, may the strangulation be? We are told it may be strangulated at the external abdominal ring, and by the structures composing the ring: it may be in the inguinal canal, and caused there by the lower margins of the external oblique and transversalis muscles, which cross it in that passage; it may be in the internal ring, and caused by this opening in the fascia transversalis; or it may be caused by the neck of the hernial sac in any of those situations. It may also be in the cellular substance below the rings. I believe this to be a

very common seat of the stricture ; indeed, in most cases, I think it is in this last situation. Now, in operating for a *recent* inguinal hernia, you will generally have little difficulty in distinguishing the different layers of parts through which you have to cut, and you must divide them all in the same line. Having had the groin and pubes shaved, and the patient placed in a convenient position on a table covered with blankets, you commence your cutaneous incision about an inch above the tumour. Some advise you to get an assistant to pinch up the integuments, but I think the surgeon who could not trust himself to divide the skin without this contrivance, had better not attempt to operate for hernia at all. You take the hernial tumour in your left hand, and make the skin tense in front. After making your incision down to the bottom of the tumour, you come down on the superficial fascia. This membrane will not always present the same appearance on exposure. Sometimes it will be as thin as the arachnoid membrane ; at other times, it will appear remarkably strong and firm. This structure you either divide in the same way as you did the integuments, with a light hand, or you pinch up a bit between your finger and thumb, make a slight cut in it with the blade of the knife held in a horizontal position, and slit it upwards and downwards on a director, to the extent of your first incision. In this stage you may spring a small artery called the external pudic : it rarely, when wounded, requires a ligature ; if it bleeds smartly get an assistant to compress it, at least for the present, or let him take it in a forceps and give its cut end two or three twists, and it will give no more trouble. I merely mention the matter that you may be prepared for it. The next thing you will have to cut is the prolonga-

tion of the inter-columnar fascia, and then you come down on the cremaster muscle; this is easily enough distinguished by its fibrous appearance; it sometimes, in old herniæ, attains a great thickness and strength; its colour is generally yellowish, or with a very pale tinge of red. Beneath the cremaster, and between it and the sac, is usually found some loose cellular membrane connecting these parts to each other; it is what may be called the fascia propria, a membrane of which I shall have to speak more particularly in connection with crural hernia.

As you are dividing the different layers of parts you come down on, take care that your assistant does not pull any of them out of the line of your first incision—that he does not disturb their relative positions. Sometimes you will find all the parts, when you are operating for hernia, as distinct as you would find them in the dissecting-room, but sometimes you will find the most confused masses of parts, in which there is no distinction whatever between them to be observed, and this even in very recent cases. You will see some surgeons cutting through the different layers of cellular substance on a director, but this is really an useless caution, and takes up a great deal of time: just keep your eye on one line, and cut through them lightly, as you cut through the skin. When you come to what seems to you to be the sac, cut through it with a very light hand, or if you distrust yourself, just pinch it up in the forceps, or between your finger and thumb, taking care that no intestine is included, and cut it horizontally: you then introduce a director, and cut the sac freely upwards. In hernia, and particularly in femoral hernia, you are not unlikely to mistake the sac for the hernia itself, and acting on such a mistake may be a matter

of very great consequence to the patient ; for if it be the sac, and you think it is the hernia, when you find it adherent above at its neck, you will occupy a great deal of time in separating these adhesions, and considerably increase the danger of peritoneal inflammation. Now, how are you to know whether it is the sac you see, or its contents ? You sometimes cannot avoid the mistake without very great attention, for the surface of the sac is now and then found as smooth as that of the intestines themselves. There is one way to distinguish them in which you will never fail : just pass your finger up along the exposed part towards the stricture, and when you get there, if it is the hernia, you will be able to feel the margin of the ring or the stricture. I do not mean to say that you will be able to introduce your finger between the hernia and this constricting ring, but you will be able to feel it accurately, whereas if it be the sac that has conducted your finger up, when you have arrived at the stricture, your finger will be borne quite away from its margin, in consequence of its adhesion to the sac. Another method of distinguishing between them also, and one on which you may entirely depend, is to pinch up a little bit in your finger and thumb, and if it be the sac you will be able distinctly to feel the intestine within slipping under your fingers. Some advise you to open the sac at its lowest part, because, say they, there is a fluid between the sac and its contents, this will gravitate to the bottom, and by bearing the gut off from the side of the sac, will make the opening of the latter safer ; but sometimes there is no fluid at all in the sac. The best place to open it is about its middle, and on its anterior surface. There is this objection to opening the sac too low, even when fluid can be perceived there, that the constitu-

ents of the spermatic cord are sometimes separated by the hernia in its descent, in which case the artery takes an oblique course on the sac, and at the lower part lies rather in front of it, so that an incision carried to the bottom of the sac in front, might wound this spermatic artery before you would be aware, and more than probably interfere materially with the functions of the gland thereafter. There is another reason for not dividing the sac too low, and it is this; we have no way to know whether the hernia may not have been congenital, and if it should happen to be so, by carrying the incision low down, you would expose the tunica albuginea of the testicle which will have to form an adhesion with the wound, and be itself covered with a new cuticle, and this state of affairs will afterwards be of great inconvenience, and a cause of great uneasiness to the patient.

When you have made the small opening into about the middle part of the sac, introduce a director, and divide it down to near the bottom first, then change the position of the director, and divide the sac freely upwards. You next introduce your finger and feel for the situation of the stricture, and when you have satisfied yourself on this point, the next thing is to relieve the parts on which it presses, by making a division of it, and only to the extent necessary to return the hernia into the abdomen; the stricture is so tight that you are not to hope to be able to get your finger between it and the intestine, in the majority of instances, but you can always insinuate the end of your nail between them, and that will be sufficient. You then introduce Cooper's knife, which is the best for the purpose, with the flat of the blade towards your finger by which you conduct it up to the stric-

ture ; you pass its probed end between your nail and the constriction, and just turn up its edge, and raising the handle a little you have cut enough ; you feel the parts fly asunder on giving them the least cut possible, and on removing your finger and the instrument, will be able to put up the hernia ; you will take care not to let the knife off your nail until you withdraw it. In all cases the division of the stricture should be, as Sir A. Cooper recommends, made directly upwards, and for this reason :—In the form of inguinal hernia called *Ventro-inguinal*, or Direct Hernia, which differs from the common oblique hernia in this, that the epigastric artery lies internal to the oblique hernia, and external to the direct hernia, and if the case on which you are operating be an old hernia, you may not be able clearly to ascertain, as I before explained, whether it be oblique or direct. If you are satisfied it is an oblique hernia you could divide the stricture outwards with perfect safety, whereas if you were to cut outwards in a ventro-inguinal case you would divide the epigastric artery. You are not therefore to cut upwards and outwards, as some advise, but directly upwards where you can do no harm, no matter what kind of hernia it is.

You are told by some, that to prevent, as much as possible, the danger of peritoneal inflammation, or at least to lessen that danger, that you should not open the sac of the hernia at all, but divide the stricture external to it ; but if you could break up the adhesions between the neck of the sac and the part which constricts it, your efforts to do so would do more violence to the peritoneum than if you opened the sac freely at once. Now, in your efforts to separate the sac from the constricting ring, or to get your knife between the two, you lose so much of control over the instru-

ment, that on the resistance suddenly giving way, it might be plunged into the hernia itself, or somewhere else that would cause irreparable mischief. Besides, if you leave the sac unopened, you cannot of course tell in what state its contents may be, and your merely dividing the stricture might, in some cases, be of no use whatever. Others, as Sir A. Cooper, open the sac, but tell you not to open it higher than within an inch of the ring, and to divide the stricture external to its cavity; but, besides the difficulty in doing this, it should not be forgotten, that the neck of the sac itself may strangulate the bowel, and that in such a case, unless it be divided, you might much better have let the patient die quietly, without putting him to so much useless pain.

We are not immediately to return the bowel after the stricture is divided, and particularly if it had been a close stricture, for this reason—that, although the lower part of the intestine seems perfectly sound, and is so, yet the part that had been embraced immediately by the stricture may not be sound—you may find it in a state of high inflammation, or gangrenous, or even perforated; therefore draw down the bowel, and examine this part well before attempting reduction. When you see everything is right, you are to hold the hernia in the palm of your hand, or get an assistant to hold it: you are to push up a portion of the bowel with your finger and thumb, and when you get it fairly into the abdomen, apply the fingers of your other hand to keep it there until you catch hold of another bit to push up—you have little idea how a want of this precaution will sometimes embarrass you. I have seen a surgeon, after half an hour's labour, have more intestine down than there was at the beginning; if you do not support every bit

you get up, a much larger piece will slip down again. Adhesion between the gut and the sac is a *very* rare occurrence in hernia, and the notion that such adhesions are often found may lead to a great deal of mischief. If, however, there be a few bands confining the hernia, you may just cut them across, taking care not to go too near the bowel, for everything else must be sacrificed to it. But are we always to divide these adhesions? No; it is an extremely dangerous thing if they be very close or extensive; if there be such, leave the intestines where you find them, close up the wound, and what will be the consequence? Why, that day after day the tumour will be getting less, the peritoneum, as Scarpa has well explained, will contract, and at length the tumour will disappear altogether, and the hernia will have retired into the abdomen. When the case is an entero-epiplocele, it has been made a question, whether we should return the bowel or the omentum first, after liberating the stricture? I think this a matter of very little consequence; if there should be a globe of omentum with a small neck, I think it would not be well to push this large mass of omentum up beside the bowel, and would much prefer returning the intestine first. The piece of protruded intestine may be in such a condition as to preclude you returning it up into the abdomen—it may perhaps be mortified. How are you to know whether an intestine be gangrenous—what is the appearance of a piece of gut in that state? It has often the appearance of a wet shamois leather glove; it is soft, or covered with small black spots no bigger than the end of a probe. Now, in this last state you may return the hernia into the abdomen, for if the patient survive the inflammation, adhesions will form between the diseased bowel and the neighbouring ones, and the

canal remain perfect. Suppose, however, that the bowel be so far gangrenous that you cannot return it, all you have to do then is to divide the stricture, and leave the rest to nature. Do not attempt, as some advise, to cut off the gangrened part and sew up the part of the intestine neatly from which you removed it; it will never succeed. Stitching an inflamed intestine is a dangerous practice, and cannot turn out well. Do not mistake simple congestion of the part for a more serious condition; you will often, on exposing it, see the intestine as purple as a plum or darker, but this is only a consequence of the constriction to which it had been subjected, and will not signify.

There is another serious error you might be guilty of—if, on opening the sac, nothing presents itself to your view but a mass of omentum, and if you carelessly examine it, and then return it, you may enclose in it a bit of intestine not so large as the top of your finger, and this may continue to be tightly girt by the omentum after it has been returned into the abdomen, and the patient may die of the strangulation, or of peritoneal inflammation; spread out the omentum therefore freely, and examine its folds very closely, particularly at the place where it had been constricted. Do not forget that omentum, when strangulated, may produce every one of the symptoms, and bring the patient into as much danger, perhaps, as a strangulated bowel itself could do.

When you have removed the stricture, and returned the intestine, draw the lips of the wound in the skin together, put a couple of stitches of the interrupted suture in it, and put the patient to bed. After a few hours he may have a stool, but if not, administer a purgative glyster, the hiccough will stop, and the stomach get tranquil. Sometimes, however, he does

not have a stool, nor do the symptoms cease. *Treat this case as one of peritoneal inflammation.* Suppose the belly is become small, and the pain on pressure is entirely gone, but the stomach is still irritable—what are you to do? Why, I have in such a case bled—bled on—without doing the least service, but the administering of an opiate has set everything to rights directly. When the omentum is gangrenous it has a peculiar crispy feel, and a dirty white colour; do not return this gangrened piece of omentum; if you do the consequence will be just what happened to a patient of mine—she was an old woman on whom I operated by candle-light, and I reduced what I thought was a sound omentum, but things were not doing well, and in two or three days a great gush of matter came from the wound, and in a few days more the piece of bad omentum came away, and the patient recovered in despite of my bad surgery.

Sometimes, in the case where intestine and omentum are down together, the omentum will form, as I said, a girth round the bowel, and it had been overlooked, if after a time you should not have relieved your patient by the operation, and that the continuance of the symptoms cannot be attributed to inflammation, you are justified in cutting out the sutures, introducing your finger through the wound into the abdomen, searching for the strictured bowel and disengaging it. If the stricture in inguinal hernia be in the internal ring, you will find Cooper's hernia knife particularly useful, as it only cuts just what you require.

You should not be too sanguine of the success of your operation, under the most apparently favourable circumstances. There is a remarkable fact connected with their termination which I have witnessed; it is this—you have operated, and relieved the stricture,

and shortly after the patient has one or two stools, his stomach gets easy, and he appears to be going on very well, yet this man in a little time falls back, he gets worse, and will sink rapidly on the second or third day, and yet there is no inflammation whatever—in fact, he dies of perfect inanition. Sometimes there will come on a severe diarrhœa a short time after the operation, accompanied with fever, and without you attend to it carefully the case may end badly; it is inflammation of the mucous membrane of the bowels, caused by the stricture a part of it had undergone while the hernia had been strangulated, and you are to treat the case as one of ordinary enteritis. Hernia of the cœcum is peculiar in some things. You know that as this portion of the intestinal canal lies in the right iliac fossa it is generally but partially covered by peritoneum, and the consequence is that when it is the subject of hernia it may either have a partial hernial sac, or none at all. In the former of these cases the sac does not quite encircle the hernia, and of course the stricture can never be, under such circumstances, in the neck of the hernial sac, as in other cases, and if you can discover this during the operation you need not open the peritoneal covering. By leaving it uninjured you very much diminish the chances of peritoneal inflammation. It is astonishing the extent to which the viscera of the abdomen have been found displaced in hernia. The liver, spleen, kidneys, have been found protruded partly in hernial sacs; even the bladder and ovaries may be found protruded in the groin.*

Before quitting the subject of inguinal hernia, let

* Every viscus, but the duodenum and pancreas, has from time to time been found in herniæ.—*Ed. of Lect.*

me again recal your attention to one or two points. Remember that the constituents of the spermatic cord have not constantly the same relation to oblique hernia—that its vessels may lie on the outside or in front of the sac, although they are generally behind it, out of your way, and that this you will not become distinctly acquainted with, until they are exposed during the operation, so that you will not fail to make a careful examination before you open the sac, lest mischief should be caused through inattention. You will also recollect that the sac of the ventro-inguinal hernia is not generally covered in front by the cremaster muscle, but that sometimes the fibres of this muscle do cover the sac in front, so that when you find the muscle in front, you are not to be too confident that the hernia is an oblique one. While you bring your anatomical recollection to bear on the number of parts that your knife will have to divide in operating for inguinal hernia, you must not forget that the subject in the dissecting-room only presented you with distinct, healthy, and undisturbed parts, but that in strangulated hernia those same parts may have been so consolidated, and their natural relations so altered that you cannot, without risk, proceed *solely* on your previous knowledge of their anatomy. You will likewise be careful in watching any symptom that might occur for some days *after* the operation, and not consider that you have done everything necessary when you have stitched the wound you made, for quite as important matters may still remain to be done by you.

LECTURE XX.

FEMORAL HERNIA—PARTS CONNECTED WITH—DIAGNOSIS—OPERATION—MR. COLLES' OPERATION.

FEMORAL HERNIA, although sometimes met with in the male subject, is much more common in females, while in the latter, inguinal hernia is rare, compared to its occurrence in man. This may be accounted for by the difference in the anatomy of the parts in the sexes. The space between the anterior superior spinous process of the ilium and the spine or tuberosity of the pubis is greater in women, while the inguinal canal is smaller, because it has only to transmit the round ligament of the uterus, and this substance is much less voluminous than the spermatic cord, consequently the apertures through which oblique inguinal hernia should protrude are less open to receive it in women. There is but one spot where the abdominal viscera could make their way down on the thigh, and that is between the femoral vein and the edge of Gimbernat's ligament ; this is called the femoral ring. When you look at this part from the cavity of the abdomen, you see a slight depression in the peritoneum at the seat of the ring, that is just on the pubic side of the iliac or femoral vein. If you strip the peritoneum off these parts, you do not clearly distinguish the ring yet, for it is filled up by a quantity of loose cellular membrane, frequently containing fat, and in scraping out this you observe a lymphatic gland involved in it—sometimes two. This cellular mem-

brane is a continuation of the *fascia propria*, which is here altered from the appearance which it has in other situations; it is a membrane which lies between the peritoneum and the fascia transversalis, and connects these parts together. In some places it can be distinguished as a distinct membranous layer, thicker and stronger in some situations than in others, and degenerating into mere cellular membrane occasionally, as in the spot that we are particularly considering—namely, behind the femoral ring. The *fascia propria*, is, as we saw, also intimately connected with inguinal hernia. You have now fairly exposed the rigid structures that form so important a part of the anatomy of femoral hernia. The boundaries of this ring as usually given are—Poupart's ligament in front, the horizontal ramus of the pubis behind, the femoral vein on its outer side, and the sharp concave edge of Gimbernat's ligament on the inner. These are the parts, then, which should immediately surround the neck of a crural hernia; but this is not the fact, and it is a matter of practical importance, as we shall hereafter see, to correct this description in some parts. If the pubic side of the femoral vein was the outer boundary of the crural ring, we should expect hernia to be very frequent, as the soft yielding vein would be unable to resist even a very slight pressure of the bowels; but there is a ligamentous band going from the front to the back part of the mouth of the sheath of the vessels which separates the vein from the hernia. The true boundary of a crural hernia on the inner or pubic side is not formed by Gimbernat's ligament; and as I am anxious you should clearly understand this matter, I have the parts here sufficiently exposed, to convince you that it is the junction of this the iliac portion of the fascia

lata to the pectineal portion, that extending more outwardly, or nearer to the vein, does really form the constriction on the inner side of the sac. You will have opportunities of still further satisfying yourself of this in the dissecting-room, by pushing your finger into the crural ring from the abdomen, when you can feel the edge at this junction, and examining the edge of Gimbernat's ligament, you will find it lying internal and superior to the part that really constricts your finger. The inguinal vessels take a fibrous sheath down with them from the abdomen into the thigh as low as the place where the saphena vein enters the femoral, that is about an inch and half below Poupart's ligament. This sheath is a strong fibrous structure in some places; when laid bare behind Poupart's ligament and on the thigh, it will be seen clearly to be a continuation of the transversalis and iliac fasciæ. The outer or iliac side of this sheath has nothing to do with hernia, for it is separated from the femoral canal, into which hernia descends, by the femoral artery and vein. The pubic side of this sheath alone forms the internal boundary of the ring, so that, in fact, Gimbernat's ligament, or the third insertion of the external oblique muscle, as it is called, has nothing to do with the aperture through which a femoral hernia descends from the abdomen. Now, it is very necessary for you to recollect why a femoral hernia can only descend in the one spot, named the femoral ring, or the *upper* femoral ring, as it is sometimes called, to distinguish it from the saphenic opening in the fascia lata, which some call the *inferior* femoral ring. The mechanical barrier to hernia, external to the femoral vessels, is the junction of the strong fascia covering the iliac muscle with the fascia which lies behind the transversalis muscle—they unite nearly on a line with

Poupart's ligament. Internal to the femoral vessels and their sheath hernia cannot descend on account of that strong fibrous partition between the belly and the thigh called Gimbernath's ligament.

Femoral hernia generally comes down below the falciform ligament of Hey, and escaping through one of the little openings found in what is called the cribriform fascia for transmitting the superficial absorbents and blood-vessels, or through the saphenic opening, it then either turns up over Poupart's ligament, or lies in the line of that ligament, extending towards the spine of the ilium. When the surgeon is called in to a patient who is vomiting, and has colicky pains, he ought always examine the groins to find out if the case be hernia.

Now, there are some appearances which may be mistaken for crural hernia. A fatty substance found near the femoral ring sometimes gets into the exact situation of this hernia, and might be mistaken for it. I never saw this in a living subject, but I have often found it in the dissecting-room when I was in the habit of attending much there. The femoral vein may become varicose, and when it is so, it presents a tumour very much resembling femoral hernia. If you bid the patient cough, you feel it pushed down like a hernia, but there is this difference—the varicose tumour immediately recedes after the exertion of coughing is over, but the hernia, although it may be made larger by coughing, &c., yet it never recedes by itself, because the opening through which it has descended is so small. Sometimes a hernia really exists under circumstances where we do not suspect it; for instance, a femoral hernia in coming down pushes before it the lymphatic gland I before mentioned as lying in the femoral ring, or some other

gland in its course: the surgeon makes the best examination he can—he feels the gland—he presses it, and it gives pain—he knows that an inflamed gland is not to be distinguished by the resulting symptoms from many cases of strangulated hernia, and at the instant, he may imagine there is nothing more serious the matter than the inflamed gland. Now, suppose he suspects there may be more, or having the least doubt on his mind, he makes the strictest investigation the nature of the case will admit, still he may detect nothing that can give him positive information, and what is he to do? Why, if the symptoms are violent, he is not only perfectly justified in undertaking the operation for strangulated femoral hernia, but it is his imperative duty to do so under such circumstances, knowing that without exposing the parts with the knife he cannot be certain of the truth—knowing that there may exist a strangulated femoral hernia without any tumour externally at all,—and that at any rate nothing can be lost, and a great deal may be gained by it. When a hernia pushes down into the sheath of the femoral vessels, how does it escape from it so as to appear on the thigh quite superficial? When it gets some way down into the sheath it escapes through one of the openings for blood-vessels or absorbents existing in the cribriform fascia, and hence it is that the seat of stricture may be much deeper from the surface at one time than another; that it is sometimes high up, and another time at no inconsiderable distance from Poupart's ligament. Now, in consequence of the attachment of the superficial fascia to the fascia lata, when a hernia has got out through one of the openings I have mentioned, its progress downwards is checked by the superficial fascia, and as it protrudes farther it is turned upwards towards

Poupart's ligament and the external abdominal ring, directly over which it sometimes lies, and in this situation has the appearance as if it was an inguinal and not a femoral hernia.* The distinguishing the one from the other is often very difficult, and sometimes almost impossible. You might perhaps sometimes be able to establish a diagnosis by getting your fingers a little under the part of the tumour nearest the anterior superior spine of the ilium, and to push the tumour downwards on the thigh, to the place where it had been tilted over Hey's ligament, and following it downwards until you find it terminate abruptly below this part, or sinking into the thigh, as it were, and perhaps you can even follow it with the end of your finger under the part through which it had escaped. If you can do all this, there is of course no doubt of its being crural hernia. Now, in the examination of such a case, you are told to find the line of Poupart's ligament, and endeavour to ascertain if the neck of the sac is above or below this line. Why, in old women, where there is a great deal of fat, it is impossible to find Poupart's ligament at all, and as to seeing if the neck of the sac is here or there, I can tell you it is easier said than done, for all the difficulty is to find the neck of the sac; if you can only find *that*, of course you will know everything about the matter. The best way to examine the case is this—get your fingers into the hollow of the thigh and push them upwards in the direction of the femoral vessels, and they will receive a sudden check from the

* In some rare instances this attachment is broken through, and the femoral hernia may descend a considerable way down the thigh, as I saw it do in one instance in the Lock Hospital.—*Ed. of Lect.*

tumour, which you are conscious is deeper-seated than the neighbouring glands. There will be a decided and abrupt resistance if the case be hernia. I would defy a surgeon to be able perfectly to satisfy his mind in most cases by trying from above ; but should there be no strangulation, they are easily distinguished from each other. In the *femoral* hernia the upper part of the tumour is moveable, and you can push it from side to side, but if it is strangulated, (and females do not often subject it to examination unless it is so,) it then becomes fixed, the upper and larger part of the tumour is not moveable, and the investigation is more difficult. To distinguish between them you could not have a more fallacious guide than Poupart's ligament as I before explained, and all you can do is not to mind that part of the tumour which is on the abdomen, but direct your attention to that part of it which is on the thigh, and make your examination of that in the manner I have already described : it will not fail to distinguish the cases. It is said psoas abscess is one of those things that may be confounded with femoral hernia. I certainly see little resemblance between them, and no difficulty of distinguishing one from the other. A psoas abscess is on the iliac side of the femoral vessels where a hernia could not make its first appearance for reasons I before pointed out : the matter of psoas abscess is not prevented coming down on the thigh by the iliac fascia, or its connection with Poupart's ligament, and the transversalis fascia, for the matter is beneath all these parts, and there is nothing of any strength to prevent its gravitating. But supposing the femoral hernia be large, and extends so far outwards as to lie in the situation in which the tumefaction of psoas abscess is commonly found, the abscess is generally attended or

preceded by pains in the lumbar region, and examination of the spine will enable you to detect disease there—you will feel a fluctuation in the swelling ; but there is one thing that will set your mind at rest at once—it is this : you feel in the case of the psoas abscess, most generally, a fulness *above* Poupart's ligament as well as below it, and if you place a hand on each fulness, and press them alternately, you will find that their contents communicate with each other : there is nothing of this in the case of the hernia—in fact, no moderately well-educated or practised surgeon could confound the two things. The feel of a femoral hernia differs a little from the inguinal one, in a somewhat greater firmness or resistance to pressure : it is usually more tense.

The stricture in femoral hernia may exist in the upper femoral ring, or the abdominal opening of the sheath of the vessels : it may be in the aperture in the sheath and fascia lata by which it becomes superficial, or in the hernial sac. Now, by the brief sketch we made of the anatomical points of this hernia, and there is no form of hernia in which a correct knowledge of anatomy is so essential as this, you will easily conceive the proper position in which to place your patient, when about to perform the taxis, to effect the most perfect relaxation of all the structures that could constrict the protruded parts : you put him in the same position as for the reduction of inguinal hernia, but in the present case you take especial care to flex the thigh, and turn the knee inwards to relax the fascia lata, which is so particularly engaged in the strangulation. By taking off its tension you relax the superficial fascia which covers the tumour—the cribriform portion of the fascia lata and the sheath of the vessels, through openings in which it escapes on the

thigh—the process of the fascia lata that joins the iliac to the pubic portions above Poupart's ligament, and through it the transversalis and iliac fasciæ and Gimbernat's ligament. Your first proceeding in the taxis is to draw the hernia down on the thigh as much as possible: you then push it backwards, as if you wished to push it into the thigh, and finally, to push it upwards towards the upper femoral ring; but you will oftener fail than succeed in your trials to reduce a femoral hernia by the taxis. It is a curious fact, but true, that you will oftener succeed in reducing a femoral hernia by the taxis in men than in women. Should you succeed, the best thing to keep it up is the common inguinal truss, with the lower edge of the pad turned more abruptly backwards: some prefer the self-adjusting truss, as it is called, but after wearing it awhile they will return to the common one, then back to the self-adjusting one, and so on. Omentum is sometimes found in femoral hernia: you may see an instance of it in this preparation.

Sometimes a femoral hernia will appear only the size of a little gland, and is on a level with the upper crural ring: here you can push it directly back into the abdomen. If it mounts up on the abdomen, or lies along the course of Poupart's ligament, you are first to bring it down on the thigh, and having done so, you push up the part next the ring first: if you are not cautious on this point your efforts to get up the hernia may be only enlarging its quantity: you are not to try and push the bottom of the tumour up first. There is more caution necessary in the degree of force you use in the taxis in femoral than in inguinal hernia, because, in the former, the openings through which it comes are so small, and their edges so sharp and unyielding, that the same degree of pressure will

be injurious in proportion. The operation should be performed earlier in femoral than in inguinal hernia: but remember *time* is not the criterion in these cases; symptoms alone are.

In the operation for femoral hernia you should always begin your first incision at least an inch above Poupart's ligament; for you cannot think how a low cutaneous incision will embarrass you in the rest of the operation. You are directed to continue this incision down on the tumour, exactly in the middle line; but for my part I would prefer keeping it a little to the pubic side of the middle line of the tumour. You make a transverse incision at right angles with this in form of the letter T reversed. If your first incision had not divided the superficial fascia already, it is now to be cut through; sometimes you find a second layer which you will divide in like manner: this you can do either by a light stroke of the knife, or by pinching it up with the forceps, and making a small opening with the knife held in a horizontal position, and complete the incision with a scalpel on a director; you need not spend time scratching through it, as some surgeons do. You may now make another effort to reduce the hernia, but in a gentle manner, and should you fail you proceed with the operation. You need not delay looking for that process of fascia transversalis, or fascia propria, which you may expect to find next; for probably it may be, as it were, consolidated with the sac, or lost in the sheath of the vessels. The lymphatic glands which are here so numerous may give you some trouble; all you have to do is to cut through them, or cut them out, as they come in your way. I mentioned before that in femoral hernia particularly, it is extremely difficult often to tell whether what is before you, after going through the first steps

of the operation, is the sac or the hernia itself, but the methods of discriminating which I pointed out can be applied in every case. Although you cannot get your finger into the ring, between it and the hernia, you can in the closest stricture get in the top of your nail, and if you do this you may be sure that your finger is within the sac, and that what you see is the hernia; the nail is a better guide for the knife than a director, for you cannot tell how far it may be going beyond the stricture after it has entered it, and if the knife should go deeper than necessary, which is just within the stricture, it may, and indeed will, be very likely to do mischief.

If there be any fluid in the sac it is in the lowest part of it, and in this place you would prefer making your opening into it: if you feel that the sac contains omentum, you may be bolder, for there is no great harm in giving a little scratch to omentum. You next introduce a director into the opening, and slit up the sac to its neck, and make another trial at reducing the hernia, having relaxed the parts by a proper position of the limb. When you have exposed the hernia, if you see a bunch of intestines out, then comes your difficulty, and that difficulty is chiefly in the smallness of the aperture through which it protrudes. If Hey's ligament should *seem* to form the constriction, you get an assistant to hold down the bowels out of your way, if you cannot conveniently do it yourself, and introducing your nail, with the back upwards under the middle part of Hey's ligament, and between it and the intestine, you introduce a probe-pointed bistoury sideways, with the flat on your nail, until it is just within the stricture, you then turn the edge upwards, and raising the handle very gently, the resisting part flies open: you would have about a quarter of an inch

space for your incision here before you would get to Poupart's ligament, and that would be more than enough to take off any constriction at this part; you again try the taxis. Now, if you fail you are told the constriction is made by Gimbernat's ligament—well, you run your finger along the bowels up to the ring, and having got the end of your nail into the stricture, which you can always do, and ascertained that it is the hernia, you pass in Cooper's knife with its flat against your finger, and having turned the edge, you feel instantly the crackling of the parts giving way. This allows you to get in more of your finger, and you finish the operation by dividing the stricture to the necessary extent in a direction upwards and inwards. If you cut directly inwards you risk wounding the spermatic cord. You are aware that the obturator artery, which most generally arises from the internal iliac, sometimes comes off in common with the epigastric, and then it generally runs first in front, and along the inner side of the femoral ring, and this artery might be wounded in the operation I have described; and patients have died of the internal hæmorrhage from a wound in this irregular obturator artery, notwithstanding all Mr. Bell has said to the contrary. There is another and less frequent irregularity where the obturator artery having the same origin as the preceding, runs round the outer and back part of the neck of the sac. As we cannot know whether or not there is this irregular obturator artery in a case we come to operate on, it would be important if we could devise a method of operating in which there could be no danger whatever in wounding it. Now, there is a way I would propose to operate which would entirely remove all apprehension of wounding this vessel. As it lies in the abdomen, the

knife of course must enter that cavity to wound it. In my operation you relieve the stricture without entering the cavity of the abdomen at all. You recollect what Mr. Hey describes as the falciform edge of the fascia lata; but there is really no such edge, nor even much appearance of it, except the limb is put upon the stretch. I mentioned that the fascia transversalis uniting with the iliac fascia sends a ligamentous pipe or sheath for the femoral vessels down the thigh: this sheath has a crescentic form on its pubic side. At the femoral ring you will recollect that Gimbernat's ligament does not go outwards as far as this sheath, and of course cannot constitute the stricture in femoral hernia, but the stricture is formed by a portion of the iliac division of the fascia lata, which runs between the femoral vein and the spine of the pubis. Now, you begin your incision from an inch or an inch and a half above Poupart's ligament to an inch and a half below it, parallel and close to the pubic side of the femoral vein. About half an inch below Poupart's ligament make a transverse incision extending from the first one to the spine of the pubis, turn up the flap and cut through the superficial fascia in the same direction and extent as the cutaneous incision. Having opened the sac as high as Poupart's ligament, divide this superficial constriction to the same extent, but in the direction towards the spine of the pubis. Should this not liberate the hernia, introduce a director external to the sac, on its pubic side, and on it the probe-pointed bistoury, and after entering its point about the eighth of an inch above or within the attachment of the iliac portion of the fascia lata to the pubic portion, and keeping the flat of the knife close to the pectinæus muscle, divide this attachment to the neces-

sary extent: this you can do without entering the abdomen. The part of the fascia lata you cut in this operation is not attached to the bone, but to the fascia which covers the pectinæus muscle. I assisted a gentleman who was kind enough to operate in this manner at my suggestion, and it completely succeeded. I attempted it myself, but the patient was a fat woman, with an over-hanging belly, and I was obliged to operate on her while she was in bed, and from these unfavourable circumstances I had to desist. Besides the avoidance of wounding the irregular obturator artery, which I conceive this method of operating effects, there is another and very important advantage obtained by it—namely, that as the knife does not enter the abdomen, and as the incision through the sac is made at some distance from that cavity, the likelihood of the operation being followed by peritoneal inflammation will also be diminished. To perform this operation your patient must be placed horizontally on a table, with the shoulders a little raised and the legs hanging over the edge.

If the operation for strangulated femoral hernia is delayed too long, that will sometimes happen which a patient of mine experienced. Six days after the occurrence of the hernia I operated on a lady; after a few days, during which she seemed to be doing well, she got a colic: this went off, but it returned again, and thus it kept coming and going for twelve months, during which time she never had a solid stool. At the end of that time she died, and on examination after death, the portion of the bowels which had been strangulated was found thickened and contracted very much in size. *Artificial anus* is an occasional consequence of hernia. If a patient recovers with an artificial anus it may last for six months,

during which time all the fœces are discharged at the groin. At length he passes a small quantity by the anus—more and more comes daily by the rectum, and the artificial anus contracts gradually in size, until at length it closes altogether. After some time, perhaps in consequence of some irregularity of diet, it breaks open again, and the patient has renewed all the inconveniences of the artificial anus for awhile longer. The recovery from this state is owing to the tendency of the peritoneum to draw itself into the abdomen. There is one case of artificial anus from which the patient never gets well—which continues with him through life—it is where the cavity of the abdomen has been penetrated by a wound, and a part of the bowels divided. If symptoms of strangulation or obstruction occur at the artificial anus, introduce a director into the opening and stir it about, and on withdrawing it a quantity of fluid fœces flows out, and the patient is well. Eversion of the gut may take place in an artificial anus, and if you are called in immediately you may be able to put it back, but if it remains out any length of time, you will never be able to return it. Sometimes these cases appear to be kept open by the projecting of a part of the intestina coats between the orifices of the two portions of intestine, preventing the contents of the portion coming from the stomach from getting into that leading to the rectum, and various methods have been advised to remove this partition. I think moderate and continued pressure, as advised by Dupuytren, is the safest practice and most likely to succeed.

LECTURE XXI.

UMBILICAL HERNIA. WOUNDS OF ARTERIES—SECONDARY HÆMORRHAGE—LIGATURES.

THERE are two distinct forms of hernia often confounded under the name of *Umbilical Hernia*. The umbilical ring, you know, is a circular aperture in the *linea alba*, through which pass the umbilical arteries and the umbilical vein, from between the abdomen of the fœtus and the placenta of the mother. Along with these parts there also passes, for the space of quarter or half an inch, a little cul-de-sac of peritoneum, the length and distinctness of which is much increased by gentle traction on the umbilical cord: enough of it is always discoverable to show that the child in utero is very liable to a protrusion of some of the abdominal viscera through this ring, and that the little depression or pouch of peritoneum is a ready commencement of a hernial sac. But these parts are differently circumstanced very soon after birth, and that which had been the weakest point in the abdomen as a resistance to hernia, quickly becomes the strongest, from the contraction of the vessels, or rather the ligamentous substances into which they are converted, and from the firm cicatrix that forms after the separation of the cord. It is obvious, therefore, that true umbilical hernia is not likely to commence its formation except at the earliest periods of infancy or before birth. Now, hernia may protrude at any part of the *linea alba*, although such an occurrence takes place gene-

rally near the navel. You may often have noticed, in dissecting this part, slit-like apertures here and there for the transmission of blood-vessels, and it is probable that one of these may be enlarged by the pressure from behind, so as at last to allow the escape of a hernia, and that such may happen at any period of life. You may, however, find this form of the complaint congenital as well as that through the umbilical ring. When the hernia from malformation is very near the ring, it is not always easy to determine to which kind it belongs. We are told that if we feel the neck of the hernia, we will find it round in the true umbilical form of the disease, and of an oblong shape in the other, and when you *can* pass your fingers round the neck of the tumour, you perhaps can recognise such a distinction, but a better mark of distinction may be drawn from the fact, that the umbilical cicatrix will not be distinguishable on or about the hernia if it has protruded through the ring, while in the other case, it will be generally distinguishable on some part of the tumour, above or below, according as it is situated below or above the ring.

Writers on umbilical hernia appear to pass over the subject very carelessly. Now, I know nothing in surgery more difficult than to tell when the operation is required for strangulation of it. Without any strangulation at all in the case, the patient will be subject to nausea, vomiting, and obstinate constipation; to colicky pains, and to that coldness and faintness which such fits will be attended with, whatever their cause may be; and frequently there will be at the same time great tenderness in the tumour from flatus or temporary obstruction. In at least one case out of every six you meet with, you will not be able to return an umbilical hernia, for you do not often

see them until they are strangulated, and when they are so, they may carry off the patient in twenty-four hours, as happened to one case I was called in to see. The woman had eaten her dinner heartily on Sunday, and she was dead on Monday evening. There is something peculiar in these herniæ that causes peritoneal inflammation sooner than others; they are extremely different from all other herniæ, and in nothing more so than in the severity of the mischiefs arising from them, and the rapidity with which they run their course. When umbilical hernia arises from malformation, it is a very formidable disease; it forces its way through slits with sharp edges, and which from their form are calculated to exert strong and acute pressure on the viscera protruded through them. Sometimes, after the sloughing off of the navel string, the opening for the cord may not close, and a hernia may protrude, but in this case the protrusion does not take place until two or three weeks after birth. In cases where we are so fortunate as to effect a cure of ascites, the patient is very liable to get ventral hernia; so likewise are women after parturition, particularly if they have borne many children. You are in all these cases to employ the umbilical truss. If the hernia be only omental, which is often the case here, and that you cannot entirely reduce it, you should use the laced bag, which will give a gradually increased and steady pressure. When there is a deficiency in the abdominal parietes, you are to proceed in this way: put in the hernia, get an assistant to grasp the integuments over the part and draw them together, then apply adhesive straps over them, which will retain them in this position, and give them the disposition to adhere together, and this, if successful, will offer a resistance to future protrusion.

With infants you proceed in this way: cut something more than half a sphere out of cork, cover it with shamois leather, and keep it on the umbilicus with adhesive straps. For my part, I never think of putting a regular bandage on infants for this hernia. You are to take care that the cork only lies with its gentle convexity *on* the umbilicus, and that it is not so small as to fit *into* the umbilical ring, as it would be only doing in front what the hernia is doing behind—namely, preventing the closure of the ring.

This hernia appears in fat persons as a flat broad swelling, the boundaries of which cannot be distinctly ascertained; in those of an opposite habit the tumour assumes a pyriform shape, and is distinctly circumscribed. It is more frequently irreducible without strangulation than other herniæ, probably owing to the enlargement and adhesions of the omentum, which is almost always present in this species. There is this peculiarity in umbilical hernia, that it sometimes wants a peritoneal sac. As there is no opening in the peritoneum here naturally, it must, I should think, have a sac in the commencement; whether it disappears by rupture or absorption from about the hernia, I do not know. A knowledge of the fact, however, must make us very cautious in our first incision through the integuments, lest we come at once on the naked bowels and wound them. The sac when present is seldom thickened, except at its neck. We may make our incision through the stricture either upwards or downwards, but we should recollect that an adhesion of the intestine to the peritoneum within the abdomen often occurs, and that without precaution it might be wounded in liberating the stricture; you must introduce the finger before the knife during its division. Should the omentum be so altered in struc-

ture as to render its reduction inexpedient, it should be removed with the knife.

I have met a very extraordinary appearance in women after being brought to bed. In the first case I ever saw of it, I was called in, in consultation with two eminent accoucheurs of this city, who could not tell what to make of the case. On feeling the abdomen while the patient lay on her back, I felt an apparent deficiency in the abdominal parietes, of a lozenge shape, and of about a hand's breadth, the longest diameter being vertical. Well, we could make nothing of it. I saw her some time afterwards, and having a fair opportunity of examining her in every position, I availed myself of it, and found that when I made her stand up, it was all a deceit, for the recti muscles, which had entirely disappeared in the recumbent posture, now became prominent. I cannot understand this.

WOUNDS OF ARTERIES.

It is unnecessary for me to enter into a description of the process nature employs in the suppression of hæmorrhage from wounded arteries. You will find in Jones' work everything useful on the subject; I shall, therefore, only draw your attention to a few practical considerations. When an artery is wounded, there is immediately a gush of blood thrown out in jerks: after a little, the stream becomes less; a little after, it but dribbles from the wound, and not per saltum, as it did at first; and finally, it ceases altogether: this is what happens from a simple incised wound. As the flow of blood diminishes, you perceive a fulness forming about the wound, and perhaps you can detect a slight throbbing,

although no blood continues to be discharged. Now, what is the process by which nature thus restrains or stops a hæmorrhage? If the artery has been completely cut across, it immediately retracts within its sheath, in consequence of the natural elasticity of the vessel, and simultaneously, the blood it discharges is in part pushed into the cellular membrane connecting the artery to its sheath, and into the general surrounding cellular membrane, where it is entangled, and soon coagulates. This last circumstance is aided or accelerated by the patient growing sick, or perhaps fainting, when the force of the heart and whole arterial system is weakened. It has besides been proved by experiment on animals bled to death, that in proportion to the quantity of blood lost, the quicker is the coagulation, and the firmer is the clot. Besides the retraction of the artery within its sheath, its calibre is diminished by contraction of its coats, particularly at the cut extremities, and after a little time the blood begins to coagulate in the artery itself, and the coagulum extends along the canal of the vessel to a greater or less distance, but rarely beyond the first large branch given off by it. All that has been done as yet, however, often gives but temporary security; for when re-action sets in, when the patient recovers from his alarm and the sudden loss of blood, all these barriers may be broken down, and the hæmorrhage recurs with its first violence. But these first attempts may become sufficient, permanently, to save the patient—for the cut surface of the artery will inflame, will pour out coagulable lymph by means of the *vasa vasorum*; this becomes organised, the coagula of blood begin to be absorbed, and the artery to contract, until from adhesions of its sides it becomes a solid cord, like a ligament, and of course

no farther hæmorrhage can take place. If a man gets a punctured wound in a part of his limb, suppose, where we know there are arteries endangered, we are not to pronounce that they have escaped, because there is no hæmorrhage: for the sheath of the vessel may interpose, like a valve, between the blood and the outer orifice of the wound, and the other soft parts may have so fallen together that no blood can make its escape, or at least but a little at intervals. The best mode we can adopt here will be to treat it as a simple case—to keep the limb as quiet as possible, and to put a tourniquet loosely round it to prevent accidents. But, suppose, on your visiting this case next day, you find there has been an oozing of blood from the wound constantly going on, that the patient had had one or two fits of sinking, like fainting, that he became very weak and pale, you have reason to suspect that hæmorrhage is going on from some wounded vessel. Pressure would be perfectly useless in a case of this kind, because the quantity of coagulum round the vessel will effectually bear off any degree of pressure you could employ, and besides the patient could not bear any pressure on the part from the pain it would give him. All you can do to save the patient is at once to dilate the wound, and search for the wounded vessel, and put a ligature on it. An artery, of some size even, may be wounded without bleeding externally, but it may bleed internally, and this we know, by there being greater swelling than could be accounted for by inflammation; by the pain, by faintishness and sickness of the stomach, by the patient's anxious countenance, his restlessness and tossing about; after a time he will grow delirious, attended by a sinking of the system, and he dies either of weakness from loss of blood, or of gangrene caused

by the extravasation into the limb. But, although this is the most general cause and termination, if the mischief has not been properly attended to, it may happen that, after a little, the bleeding ceases of itself, the artery closes, the external wound heals up, and an aneurism be formed. The wound in an artery may heal up by the first intention like any other structure, and give as little trouble, if the direction of the cut is on a line with the vessel. If it be transverse the chances of such a favourable issue are greatly diminished; but experience has shown that an oblique wound of an artery much more seldom admits of a union of its lips than any other. On the whole, arteries do not so readily unite by the first intention as do most other structures, and for one reason, among others, that however wounded, there is a strong tendency in the lips of the wound to separate from each other, and they can, with difficulty, be kept in contact by any means we can employ. When an artery is partially divided, the cut part must go through the process of ulceration: this prevents reunion, and secondary hæmorrhage will occur. I have known instances occur where pressure had been made in an improper manner over a wounded artery, and that the bleeding continued from time to time to take place—that all pressure being removed the artery has healed up perfectly of its own accord. Where there is a firm support or counter-pressure under a small artery, such as the temporal, pressure will generally be sufficient to stop its bleeding permanently; even one so large as the coronary artery of the lip we know will seldom require more. If a number of small arteries are divided, as in the operation of removing a testicle, they require no particular attention, the bleeding will generally stop of itself, and not recur: sometimes,

however, this is not the case, and if you should think they are bleeding too much, or that although the quantity of blood is inconsiderable, yet you do not wish to dress up the wound while even so much is coming, the application of a little spirits and water, or turpentine, will almost always stop the oozing.

In the case of an artery in a limb being wounded, such as a slight puncture in the brachial in venæsection, there is no good in bandaging the limb—it can do no service, but may, the contrary; therefore leave the limb loose. Pressure may be practised on a wounded artery in several ways. Suppose the anterior tibial artery divided, by the slipping of a ship-carpenter's adze, where it lies on the instep, we may either draw the lips of the external wound together, and apply our compression over the skin, or we may leave the wound open and apply the compress on the artery itself. If you adopt the first method an aneurism may follow, but in the second the artery will be obliterated above the wounded part, while the end below this will granulate. If you choose to compress the vessel with the intervention of the skin, there is one thing you must on no account neglect, and that is not to leave any coagulum in the wound; wash out every bit of coagulated blood before you proceed farther, for if you do not, this will happen,—you apply your compress over this coagulum, and bind it down with a roller with what you consider sufficient tightness, but in twenty-four hours the coagulum will begin to be absorbed, and, as it diminishes, your pressure is lessened, and secondary bleeding will occur. The quantity of pressure you employ is a matter of consequence, for if you use too strong a pressure on a vessel lying on a firmly resisting part, such as the temporal artery, or this artery on the instep, you will cause ulceration

of the wound, and this ulceration will extend itself to the artery, and cause secondary hæmorrhage; and if you employ too light a pressure, you will not keep the wounded surfaces together, and will fail in your object. A few folds of linen in the graduated form, bound down with sticking plaster, and perhaps a light roller, is all that is necessary for a vessel in this condition. The graduated compress is simply a cone composed of bits of linen or lint, each successive bit being a little larger in diameter than the one that preceded it, and the smallest is first laid down. The degree of pressure to be applied in those cases is of much importance. I have often seen in a case of wounded temporal artery, or where it was opened for the purpose of abstracting blood, that a country fellow, to make sure of effectually preventing more blood being lost than what was deemed necessary, will roll up a piece of money in some linen, and bind it so tight on the wound, that in a week, when the bandage is removed, the blood will flow again; he will then bandage it tighter than before, and it not unfrequently happens that a portion of integument, the size of the coin, will be detached by sloughing; yet the disposition in the artery to bleed is not in the least diminished. One cause of the error of using too strong a degree of compression is, that the artery can be seen pulsating violently, and the idea is that you have to oppose the whole force of the heart before the bleeding can be suppressed; but this is not the case, for the blood is not sent into a wounded artery with anything like the force that it is into an uninjured one. When you wish to compress the artery itself, the best thing you can employ is a bit of sponge, or a bit of agaric cut into a proper size, and you leave it to make its way out of the wound of its own accord.

After a sufficient time has been given for the compress to come out, and that it still remains, you try to remove it, and you find it is not free or loose enough. Well, you leave it a day or two more to become loose by the suppuration, but on then trying again to draw it out, you find it faster than before, although the wound may be suppurating freely. How does this happen? It happens from the granulations shooting into the pores of the sponge or agaric, and if you were to force it out, you would give the patient a great deal of pain. To prevent this occurrence, all you have to do is to cover the sponge with a bit of fine linen before you introduce it into the wound. I need hardly mention, that it is by all means preferable to place the compress over the skin, if it be found possible to effect your purpose by doing so, because filling up the wound from the bottom delays for a long time the healing of the wound, and when healed at last, a large cicatrix, comparatively, is left behind.

Secondary hæmorrhage can sometimes be accounted for, and sometimes not. In some constitutions there is a disposition to bleedings. There are certainly many instances of secondary hæmorrhages where there can be discovered no *local* cause for them, but generally the reverse is the case. If the case be a simple incised wound, and that, contrary to your expectation, it had not made any progress to heal in eight or nine days, that it began to slough, or without this, that the granulations which had begun to form are swept away by absorption, the wounded artery, although not so prone as other parts to these things, will be very likely to bleed again; in fact, until the wound about the artery is healed, you must never believe that your patient is secure from secondary hæmor-

rhage. I have known the blood to gush out, unexpectedly, three weeks after everything appeared to be going on right, and the bleeding recurred three or four times. The most frequent cause of secondary hæmorrhage is disease of the coats of an artery; they are liable to some soft depositions, which dispose them to ulceration and prevent their taking on the adhesive inflammation: they are also very liable to calcareous deposits, particularly the larger arteries: indeed, so much so, at the later periods of life, that it may almost be considered as one of the natural conditions of that age; the deposition of the chalky matter being preceded by a wrinkled or puckered condition of the coats, with the nature of which I am unacquainted. When an artery undergoes this degeneration, it will neither admit of the application of a ligature nor pressure for the suppression of hæmorrhage; and besides there is often a ring of ulceration, or some detached spots of ulceration round the margin of the bony matter, that may cause hæmorrhage or aneurism, even without any external violence; yet this last condition is not so common a cause of mischief as the first I mentioned. Now, sometimes the methods I have alluded to for controlling hæmorrhage, will not succeed, nor will cutting the artery completely across, nor the application of nitrate of silver, or sulphate of copper, and you must have recourse to putting a ligature on the vessel. It is very essential to the success of a ligature that it be of a proper thickness and shape: it must be round and firm, and for an artery the size of the radial, a single thread of white silk, or two, at the very most, will be sufficient. Now, you must draw the ligature sufficiently tight, when you have passed it round an artery, to effect a division of its internal and middle coats. You need be under no

apprehension that you will cut through all the coats of the vessel, in whatever degree you tighten the thread, but as you can almost always feel the giving way of those two coats you want to divide, you may make your second knot on the ligature when this has been accomplished. Should you have to take up an artery that has given way by ulceration, it would not do to operate exactly at the ulcerated part; you should make your incision at least three quarters of an inch above the ulcer, and if it should be opened by sloughing, you must take it up still higher. Sometimes in aneurism you will have to take up the artery at a considerable distance from the tumour, to avoid operating on a part of it probably affected with the same disease that produced the aneurism itself—for instance, for an aneurism in the popliteal space, the femoral artery is included in a ligature high up in the thigh. I mentioned that, provided an artery be sound, there is no danger of cutting through it entirely by tightening a ligature on it; but the case is very different if it partakes of certain diseases in which it lies, as hospital gangrene, for instance. In such like cases as this, you may cut through an artery with a ligature without its coats offering any resistance whatever. Under these circumstances, if styptics, one after another, fail in stopping the bleeding, you must endeavour to trace the vessel to some distance from the disease, and there take it up.

In passing a ligature round an artery, you must use every precaution to disturb it as little as possible from its bed, and it is on *withdrawing* the needle that this disturbance is likely to take place; therefore after getting the ligature round the vessel, when you are about to remove the instrument, put your finger on the artery to keep it steady. The operation of

taking up a wounded artery often fails, from the bad constitution of the patient. A gentleman got a wound of a small chisel in the thigh, which opened an artery; he was a strong, healthy young man, and apparently a better subject for the operation than I was. I took up the artery, and a train of bad symptoms followed. First came nausea and vomiting, then swelled belly, then erysipelas of the limb, then profuse discharges from the wound, and in fact, he was in very great danger of his life, and required the greatest care and attention to save him. Your operation may fail from not putting the ligature fairly round the vessel; if you put it on obliquely you do not divide the internal and middle coats of the artery properly, and, without effecting this, you can have little hope of success, for the coats cannot unite permanently. If the ligature be too broad you may also fail, for it may only divide two-thirds of the circumference of the vessel, or not so much. Including some of the neighbouring soft parts in the ligature with the artery may cause secondary hæmorrhage; for here, too, the internal and middle coats will be but partially divided; and, besides that, as the included parts give way by ulceration or sloughing, the pressure of the ligature on the vessel diminishes or ceases altogether. In this case the bleeding recurs on the sloughing of the wound. Sometimes the wound in the artery is not within two or three inches of the external wound. Suppose a man gets a stab of a knife in the arm, the knife runs up two or three inches, and then wounds the vessel—what are we to do in that case? Why, we are told the case is very simple—that all we have to do is to thrust a probe into the wound, and that it will of course guide us to the injured vessel, when we can slit up the inter-

mediate parts, get at the artery, and take it up ! No such thing—the probe will, in fact, run in any direction in which it is pushed, and will not lead to the artery at all, except by mere chance. But, suppose, it does lead to the spot where the artery is, you think of course it would be a very easy matter to take it up and tie it ; it is not. We may talk as we please about our fine operations, but I protest I do not think in all surgery there is an operation *half* so difficult as taking up a wounded artery. You look and you see the blood coming, and you think you are just at the wounded spot of the vessel ; but perhaps the artery is wounded an inch, or an inch and a half, or two inches, from where you see the blood issuing, and the difficulty is increased if the operation is delayed for eight or ten days ; you think you are well acquainted with the relative situation of the parts, and on cutting down you are surprised not to find the artery. Although you have two inches of it exposed, you can neither see nor feel it pulsate ; one of your assistants will cry out that he has it, but no one can feel it but himself, and it turns out that it was the pulsation of the artery in his own finger which he mistook for that of the artery you were looking for. Another thinks he sees the pulsation, but no one else can. You have no conception of the difficulties of the case. If you make up your mind that you will not find the artery as superficial as you might, from mere anatomical recollections, expect, you will get rid of one of the causes of embarrassment : take your time and you will get rid of another.

It seems very plausible to say, in looking for a wounded artery, follow the track of the wound in the part, and you *must* come at length to the vessel, but it is very difficult even to trace the course of the

wound ; the cellular substance is every where stuffed with blood—nerves, arteries, tendons, and muscles, are all of the same colour ; they are all out of their position ; you lose your way among them, and the only way to find it again is by dividing fresh parts ; even when you are directly upon the wound of the vessel, you will not recognise it, for the contact of the air will prevent its bleeding in many instances. Well, despairing to find what you seek, you give up the search, and dress the wound, in the hope that, as no blood is coming, the artery may not, after all, be wounded—or at least that the hæmorrhage will not return. You are scarcely at home before a message is sent in great haste to let you know that the man is bleeding to death ; you return, and find no bleeding from the wound ; it has stopped again. You remove all the dressings, you see a small stream of blood coming, and you try to put a ligature round the part from which it issues, but you find you are only trying to tie a piece of coagulum in the sheath of the artery. In fact, you must get a full view of the wounded artery, and to do this you must introduce your finger into the wound, tear out all the coagulated blood, and if necessary, use the knife also. You sponge it all away, although it gives great pain to the patient ; you now look for the artery, you may miss it three or four times, but persevere until you find the orifice, and when you do, and have dissected the parts clean about it, put on two ligatures, one above and the other below. In following the vessel you must not hesitate to cut muscular fibres across if necessary, but of course only when you see it is so. In cases where a very deep wound is inflicted, as in the thigh, and that there is considerable hæmorrhage, the best way is to take up the main artery at once, or the limb may fall

into gangrene from the impaction of blood, or from the debility caused by the loss of blood, or profuse suppuration may follow, which at last may involve the artery itself, or may wear the patient down by hectic fever. When you have succeeded in doing for the patient the most that circumstances will admit—that is, secured the artery, you had better not be in too great a hurry to pronounce your patient out of danger; for, as the case I mentioned to you before, proves, there may be danger of which you had no forewarning, under more favourable circumstances than those you would, in such a case as we last supposed, encounter.

There are some cases where a wounded artery will not bleed at all, even when the vessel is of great size, and the injury of so great an extent as the complete division of it. This is where the artery has been torn asunder—where there has been much laceration. Where a man's arm had been torn from his body by getting entangled in the machinery of a mill, I never heard of hæmorrhage following. It is a singular circumstance, but it is true. Here is a cast of a case of the kind that was under my own care; the arm and scapula were torn away, and the nerves and subclavian and other arteries were hanging like so many cords from the trunk, yet not a vessel was tied, nor a drop of blood lost, and the man recovered, and is now strong and healthy. I mentioned that operations on arteries were sometimes easily performed, and sometimes the contrary, without any censure or praise being due to the surgeon in either case. We do not know why it is so, but we can at one time take up an artery with the greatest ease, and at another it will be the most difficult thing imaginable. Most of the cases of wounded arteries which have termi-

nated fatally, owed their fatality to the surgeon not making himself certain that it was really the artery he had taken up: you should be in no hurry, and never leave the patient with the mere *belief* that it was the artery you tied; you must always be *sure*.*

The operation of tying a wounded artery sometimes saves the limb, but sometimes it fails, though taken up in the best manner. If it be the femoral artery, for instance, that is wounded, that man will probably die; after you have taken it up, the limb falls into gangrene, though if the same artery was taken up for popliteal aneurism, the patient would recover. Now, let us suppose a man gets a stab with a penknife which wounds an artery. When you go to

* I have seen many instances of the soundness of this advice, but one deserves to be mentioned. A boy, in some lane off Aungier-street, was stabbed with a shoemaker's knife in the bend of the elbow, and the brachial artery was wounded. A man who was present had the presence of mind to thrust his thumb into the wound instantly, and stopped the furious hæmorrhage, until he brought him to the house of the late Dr. Duggan. It happened that a moment after the late Mr. Todd was driving past, and he stopped to offer his assistance, and was quickly followed by another surgeon. After nearly an hour was consumed in searching for the wounded vessel, *something* was included in a ligature, and the general *belief* was that it was the brachial artery. The blood ceased to flow from the wound, which was then dressed, and the boy was conveyed to the hospital of the House of Industry. Unfortunately, hæmorrhage unexpectedly recurred during the night, and carried off the patient before it was discovered. On examining the condition of the wounded parts next morning, it was found that the artery had not been tied, but in its stead the brachial nerve had been. The high professional character of the operators in this case gives more weight to Dr. Colles' caution to his pupils than any form of words could do.—*Ed. of Lect.*

see him, you are told he bled a great deal, but the bleeding has stopped; we are not at all justified in seeking for that artery to tie it up. The persons who were present when the wound was received, not being perhaps accustomed to see much blood, may have exaggerated in their account of the quantity lost; in fact, you are to treat this case as if the artery was not wounded at all. Sometimes when an artery is wounded, the whole cellular membrane of the limb is injected with blood. If in bleeding in the arm, the vein be transfixed, and the artery behind it wounded, the whole cellular membrane of that arm may be injected with blood in twenty-four hours. I do not consider this a favourable case for immediate operation. Wait for five or six days, when the bleeding will have ceased, and the blood begins to be absorbed.

LECTURE XXII.

ANEURISM—DIAGNOSIS—TREATMENT.

WRITERS on aneurism divide them into two kinds, which they distinguish by the terms *true* and *false*—also, into spontaneous and traumatic aneurisms. By *true aneurism* is meant the dilatation of the coats of an artery into a sac or pouch, which gradually enlarges from the impetus of the blood. By *false aneurism* is meant a rupture of the coats of the artery from some previous disease, and the escape of the blood in small quantities into the neighbouring cellular substance; that this causes adhesive inflammation; that the blood is in consequence circumscribed by a sac of this cellular membrane; that this sac becomes daily thicker and stronger, and its capacity enlarged, and approaches the surface in general, until it finally bursts by over-distension. Some eminent writers deny the possibility of aneurism by dilatation of the coats of an artery; others, on the contrary, assert that *all* spontaneous aneurisms commence at least by dilatation, however they may afterwards change this character and become aneurism by rupture, and a great deal of ingenious argument, and even experiment, have been lavished on the question, by the favourers of one doctrine or the other. When you read Scarpa and Hodgson, you will probably have read enough to inform you on the merits of each party's positions, and I believe I will not interfere much with the practical consideration of the disease by leaving your

minds unprejudiced for the examination of those authors. Accident may cause aneurism without any external wound, as, for instance, a man going up a ladder feels something suddenly give way in his ham ; he puts down his hand and feels a very small beating tumour there, the commencement of an aneurism ; or a porter, carrying a heavy load along the street, will experience exactly the same thing, without being conscious of having used any particular or sudden exertion at the moment. Sometimes an aneurism will come on in the same place without being perceived by the patient, or his being able to say when it began. He will tell you, perhaps, that the first intimation he had of such a thing was brought about in this way : he had occasionally, for some time, felt a little uneasiness in his knee, or that he had merely felt a weakness in it ; that he was not able to make as much use of his limb as he used to do, and that on rubbing his knee one night he was surprised at feeling a little swelling in his ham, and was particularly struck with its beating or throbbing. In this last way internal aneurisms begin, as those of the thoracic or abdominal aorta. Many of those are discovered, and even of considerable size, in the bodies of those that die of other diseases, and in whom, during life, the existence of aneurism was never once suspected. When pain accompanies the progress of a popliteal aneurism, it is not felt in or about the tumour itself, but in the ankle, and not equally severe at all times, for it generally grows worse in the evening. The limb soon becomes œdematous, and this also becomes worse in the evening. These cases of spontaneous aneurisms are much more frequently met with than those which spring from injuries of arteries. An artery may have five or six aneurisms at the same time in different parts

of its course. Some arteries are much more prone to spontaneous aneurism than others; for instance, the large ones are much oftener the subjects of it than the smaller, and those of the lower extremities than those of the upper by a great deal. This seems to result from the fact, that diseases in the coats of these vessels are more frequently met with in those arteries in which aneurisms are mostly observed to occur.

The contents of an aneurismal sac, when of moderate or large size, appear to be disposed in layers. Often one layer is coagulated blood, the next like fibrine in a great measure deprived of its red particles, then a layer of blood again, then fibrine, and so on, laid over each other like the layers of an onion. When an aneurism is about to burst a marked difference can be observed between it and an abscess under similar circumstances. In the former, the integuments are tense, and the most prominent part is most so; while in the latter, it is the most relaxed and soft, and it bursts at length by one or two small openings. In the aneurism the integuments become of a dirty brown colour; a patch of it dies and sloughs off; a gush of blood comes, and sometimes the patient dies instantly, but is sometimes reprieved by a bit of coagulum falling against the opening, and for a while obstructing the blood's passage like a valve. In the very first instance nothing but some watery fluid may escape from the opening in the aneurismal tumour, but ere long blood will inevitably follow; by pressure we keep the closing scene longer away, but on the patient coughing or turning in bed, the little slough may separate: by our exertions we may ward this off for twelve or twenty hours, but the pain is excessive, and there is extreme anxiety and delirium. No structure in the body long resists the enlargement of

in aneurism or its coming forwards to the surface. An aneurism of the arch of the aorta will make its way through the sternum or ribs, and yet no ulceration, no matter will occur—it seems a simple absorption from pressure. Aneurisms in the great cavities are often very difficult to discover. In the thorax, the unyielding nature of the parietes obstructs the examination, and also the fact that certain diseases of the heart give exactly the same symptoms. In the abdomen, a train of symptoms will often arise from anxiety of mind, pressure of business, and close and long-continued application to it, such as palpitations of the heart, and pulsations in the arteries of, it may be, one particular region, and that thrill in the pulse that will require some care to distinguish from aneurism. As regards aneurism of the aorta in the chest, there is one thing worthy of remark, that although the tumour presses on the vena innominata, and diminishes its capacity in a very remarkable degree, yet, during the patient's lifetime, there will be no complaint made of this obstruction to the return of the blood from the head, nor will there be any external manifestation of venous congestion anywhere. In the abdomen, also, you are liable to mistakes, and so deceptive are the signs sometimes, that patients have died of aneurism in the abdomen, in whom the disease was not in the least suspected to have existed, nor in whom could the least pulsation be perceived. I recollect a woman who died of aneurism of the cœliac axis, and the only symptom that woman had, or complained of, was a burning pain in her back: the only ease she could get was to lie on a hearth-stone on her back, and the cold gave her relief. After death, it was found that the aneurism had affected the spine by its pressure, and it was probably from this circumstance that the burning

sensation arose. There is a disease described by Doctor Baillie in some of the journals: it is a pulsation in the epigastric region, sometimes beating very violently, and which has often been confounded with aneurism. I think you may distinguish them in this way: recollect that the epigastric pulsation is never felt below the umbilicus. Now, when you come to feel it, there is certainly a resemblance to an abdominal aneurism, but there is not the thrill in it which is distinguishable in the other. Having felt the front and side of the pulsating part, lay all the fingers of one hand on the epigastrium in the middle line, and press with moderate firmness: now lay the fingers of your other hand at one side of this line, where, before pressing the centre, you had the pulsation, and you will find it all gone, nor will you have any perception of it so long as you maintain the pressure on the middle of the pulsating space: this simple experiment will always show the true nature of the pulsation. This singular affection will not be equally well marked at all times—sometimes the beating will be very violent, at other times hardly to be felt, or not at all; it does not seem to be much affected by exercise, except, indeed, that moderate exercise, persevered in daily, will often cause it to disappear, or any other means successfully employed to improve the general health. I do not know how it is produced, but it is most prevalent in weak nervous people, and rather in the sedentary than the active.

External aneurisms even are not always easily distinguished from other things. I remember at one time most of the first-rate surgeons of this city met in consultation at the Lock Hospital on a tumour above the clavicle: they all, with one exception, (old Mr. Hugh)

declared it to be an aneurism. He, however, dissented, and I took the man into Steevens' Hospital to see the issue of it, and sure enough it turned out to be abscess. I saw a case once which deceived a great many—it was a pulsating tumour in the groin, and as the proposal to take up the iliac artery was not then advanced, they did not know what to do with the case. It was therefore let to take its own course, although no one doubted its being an aneurism, and afterwards it turned out to be an irregular growth of the acetabulum from disease of the hip-joint, and the swelling had thrown the femoral artery prominent in the groin. In my opinion, the feel of an aneurism, and that of a tumour over an artery, are in general easily distinguishable.

The pulsation of a tumour over an artery is a simple rising and falling of the swelling, but in the pulsation of an aneurism you can likewise feel a dilatation and contraction. I will not pretend to say that it *does* contract and dilate at each stroke of the heart, but you have the impression as if it did. In some cases of aneurism you must press heavily, and for some time, before you can feel the pulsation; while in others, such a pressure will prevent your feeling it at all, and you can only distinguish its pulsation by touching the tumour as lightly as possible. In cases where the touch, however applied, will give you no feel of pulsation, you will often be able to perceive it by sticking on the swelling a bit of coloured paper, and keeping your eye steadily on it, you will see it agitated by each stroke of the artery. These difficulties in distinguishing an aneurism from an abscess, or tumour in the immediate vicinity of an artery, sometimes are so great, and an error might be productive of such dreadful consequences, that it is

not surprising many rules have been given to form a correct opinion. There is, however, one contrivance that cannot fail to clear up every doubt when all else fails, and one itself not attended with any danger or inconvenience whatever : it is a kind of needle with a groove running along it. This you introduce into the suspected swelling, and on withdrawing it you will see either blood or matter in the groove, as the case may be aneurism or abscess. The little wound made by the instrument is without danger in either case, and heals rapidly.

There are some processes by which a spontaneous cure of aneurism may be brought about. Thus, suppose the tumour gets a slight blow, a bit of coagulum may be detached, and thrown so into the opening communicating between the artery and the sac as to constitute a perfect barrier between them, or at least so diminish the current of blood into the aneurism as to allow its contents to coagulate, and eventually, the whole tumour to become solid, and be partially or totally absorbed in time. When speaking of mortification, I mentioned that there is a tendency in the arteries leading to a mortified part to become, to some extent, filled with a coagulum, and that this plugs up the vessel so effectually as to prevent hæmorrhage on the separation of the slough. Now, the sac of an aneurism sometimes becomes highly inflamed, and mortifies in its whole extent, and on its separation no blood will issue, but the artery will become permanently closed, and the disease be cured. To effect this, however, it is found essential that the inflammation and mortification should not be partial ; it must not be confined to a third or fourth of the aneurismal sac, but must extend as far as the artery, in order that the necessary disposition be [given] to the blood

in its canal to coagulate; and as the sac is a new formation, and therefore weak in its vital powers, and as the arterial structure, on the other hand, has naturally considerable power of resistance to sloughing, the entire sac may die without much danger of the artery. Partial death of the sac, so far from producing a cure, has very often been the cause of fatal hæmorrhage.

Another way in which a natural cure may be accomplished is, when the sac, as it increases in size, is pressed upon by something through which it cannot readily pass, and is itself pressed against the trunk of the artery on which it is formed and obstructs the circulation in it; less blood gets from day to day into the sac; and, finally, this is so filled with coagulated blood, that no more can enter it, and the disease gets well. But, unfortunately, these natural cures are not sufficiently common to give us much expectation of its happening in any one particular case, and therefore it would be wrong to withhold the resources of surgery, in the hope that nature might in time render them unnecessary.

When I first entered on practice in Dublin, there was but one way of attempting the cure of popliteal aneurism, and that was by amputation; and there are still cases where the common operation of the present day would not answer, and where all we could do would be to amputate—for example, we find that the tumour has gradually worked its way into the knee-joint, destroying all the structures in its path, and causing disease of the bones themselves. Here, if we take up the femoral artery, the patient may get on well for about three weeks, but he will afterwards decline, and will gradually sink under the diseased knee. After twenty-one days, pain will come on in

the tumour, and the case eventually go on as I say. Sometimes an aneurism which has existed five or six months, and has attained, what you would call the regular size of an aneurism of that time, undergoes a change suddenly ; from some exertion or other cause, it becomes in one night diffused through the limb, and here nothing but amputation will do. The operation of amputation for aneurism is by no means one from which you should entertain very sanguine hopes of success: the majority end unfavourably, and this, mind you, when the operation was performed formerly in much more favourable cases than those which we deem it advisable to amputate for at the present day. Pressure may cure an aneurism, but if we make the pressure on the aneurismal tumour itself, it must be extremely light : strong compression on the tumour, instead of diminishing the flow of blood through the sac, will in fact only invite or provoke a greater quantity to the part. Now, if the pressure is to be made on the *artery* going to the aneurism, the degree of compression must be directly the reverse of this. Whenever an artery is compressed so strongly as to stimulate it, without the pressure being strong enough to bring the sides of the vessel quite into contact, there will be a proportionate effort of the artery to overcome this. This was exemplified in the old practice of keeping a compress along the entire course of the artery, with the view of enlarging the anastomosing vessels, and diminishing the force of the blood going to the aneurism ; the effect of this practice generally was secondary hæmorrhage. If you resolve to try compression on the tumour itself, the best way you can manage it is by binding a bit of sponge on it with sticking plaster. The pressure must be so light on it that you would be inclined to think it could have no beneficial effect, yet this *will*

sometimes succeed. If the pressure be applied to the artery going to the tumour, it must be so strong as to cause the sides of the artery to adhere.*

Some objections have been raised to the undertaking the operation for aneurism, arising from the condition of the patient or the local affection, which do not appear to me grounded on sufficient facts, and, without such a foundation, must not be too rigidly received as valid; for instance, old age is given as an objection to the operation; but I do not think you should leave a man to his fate on this account, although, no doubt, it is not the most favourable state for it. But there is an objection of much greater consequence against attempting the operation—what you might properly call an aneurismal diathesis. Now, how are you to know that a patient has this aneuris-

* Early last year I brought the subject of the treatment of aneurism by pressure before the Surgical Society of Ireland. One of the cases I mentioned on that occasion had been under my care several years ago, and is, I conceive, extremely interesting on account of the success attending the application of compression, under every disadvantage that I could suppose possible to attend an aneurism. The patient was an habitual drunkard—had had another aneurism previously of such a nature that the man's life could only be saved by amputation. The vessel I acted on was of large size—was most unfavourably situated for the application of steady compression—and the compress had to be fixed almost immediately over where the vessel gave off a branch nearly, if not quite as large as itself—namely, the femoral artery, where it passes over the brim of the pelvis. The particulars of this, and one or two others bearing on the same point, may be found in the *MEDICAL PRESS* for 26th April, 1843, among the proceedings of the society. Two or three other cases of the successful treatment of aneurism, by pressure, have been since reported from the Dublin Hospitals.—*Ed. of Lect.*

mal diathesis? Your success in the investigation will greatly depend on circumstances. If the patient has been lying in bed for two or three days, you will not be able to discover a pulsation in any part of his body; but if you rouse him and make him get up, you may feel a pulsation in some other artery dilated into an aneurism. Should there be no external appearance of this kind, you must examine the state of the cavities. Well, you lay your hand on his chest, and you will feel nothing—will that satisfy you? No. You have heard me say that in the thorax, or even in the abdomen, the cavity of which is as yielding as you could desire, an aneurism may exist, and yet no pulsation be felt; but although this may be so in the case before you, you will, perhaps, find he has a difficulty in his breathing: this dyspnœa from an aneurism in the thorax, is, in my opinion, unlike any other dyspnœa in its character—it is a kind of panting, like that of a sheep over-driven. When you find the arteries of the cavities, and the superficial ones, give no adverse indications, you may proceed to operate. You must not forget one fact, that in any operation you may be called on to perform on arteries, you may not, and probably will not, have the guide of their pulsation to lead you to their exact situation. When an artery is laid bare, even one so large as the femoral, and lying so superficial as that does, it will not pulsate, and you must trust entirely to your anatomical knowledge when you purpose putting a ligature on a sound vessel, where its natural relations are undisturbed, as is usually the case in operations for aneurism. As I before observed, we operate at some distance from a spontaneous aneurism, for the greater security against any disease in the coats of the artery influencing the success of the operation.

If a patient labouring under aneurism will not submit to an operation, is there any chance of benefiting him by other means—can anything be done to cure his disease, or to check its increase? We have seen that this affection does sometimes get well without surgical aid, and cases are recorded of success from other means than operation, and therefore we leave nothing undone that might give hopes of success. We should enjoin perfect rest for a considerable time, low diet, cold applications constantly to the tumour, and the use of digitalis. We can scarcely do more than this.

The place where the femoral artery is to be tied in popliteal aneurism is where it is about to be crossed by the sartorius muscle—a spot which, however, has no external mark by which you can be guided. You will best discover the line of the muscle itself by rotating the thigh a little inwards. Mr. Hunter, who was the first that conceived and established the principle of this operation, tied the artery after it was crossed by the sartorius; but the exact spot does not seem to me very clear. Now, besides the greater difficulty of coming at the artery when covered by the sartorius, suppuration and confinement of the matter will be more likely to occur here, and even concealment of bleeding, the occurrence of which it would be important to know about. The place where it is now generally tied, is where Scarpa advises—namely, the spot in which the artery touches the sartorius; and your incision through the skin, superficial fascia, and fascia lata, should extend three inches above this point. There is often a great error made even in the first incision, and that is in cutting too much inwards, by which the saphena vein is often wounded. This would be not only dangerous in

itself, but when it occurs there is a great deal of confusion, for when an accident happens in the beginning of an operation, everything afterwards appears to go wrong. You will meet some lymphatic glands in your way—just cut through them, it will do no harm; it is hardly necessary to make the skin tense for your first incision, but if you think it necessary, do it yourself, with your fingers divaricated, cutting between them; do not let an assistant make tense the skin for you, for by pulling it a little on one side or the other, he might make you change the line of your incision. Your first incision should be between two and three inches long, and that through the fascia of the same length, to prevent the formation of abscesses afterwards under it. You will meet next the sartorius muscle, and this you will have to draw a little towards the iliac side out of your way, with a broad retractor. When you get to the sheath of the vessel, just open it like the other parts, or if you distrust your hand, make an opening with the blade of the knife held horizontally, introduce a director, and slit it upwards and downwards. After opening the sheath, you still have not the artery sufficiently exposed, and must take the side of the sheath in a forceps and clear the artery of it, otherwise you will not be able to get a blunt needle round it, and your efforts to do so will disturb the vessel. These trials with the needle, to overcome what should have been previously removed—namely, the cellular substance connecting the artery to its sheath, may cause you to run the needle into the femoral vein; this would excite inflammation of the vein, which would be certain death. If you had encountered the accident of wounding this vein you might not be conscious of what had happened until you were *with-*

drawing the aneurismal needle, when a great gush of blood would inform you of what you had done. You know that at this spot the vein lies behind the artery to its inner side, and is often not seen at all, but it will be most easily avoided by introducing the aneurismal needle from within outwards. When you are about to withdraw the needle, place your finger on the artery to prevent its being raised from its bed, or disturbed unnecessarily in any way. A round ligature of three silk threads will be quite sufficient for the femoral artery. Some advise you to put two ligatures on the vessel and to divide it between them. I think when you can relax the limb one ligature is always enough, but if you wish to apply two, take particular care to leave enough of the artery between them, to avoid all danger of the ligatures slipping off, at least half an inch of it. An accident of this kind occurred in London which was the reason for introducing a contrivance to prevent such a thing happening again, and as bad a practice it was as ever was conceived. It is this—you take up the ends of the divided artery and pass with a fine needle the ends of the ligature through them. Now, this causes such a disturbance of the artery as will be likely to be extremely injurious; but the practice is quite useless. It is absurd to say that it was the force of the blood that drove off the ligature, for if this force was sufficient to push it off the upper end, it surely could not do so from the lower or distal end of the artery, which happened to be the case in the instance related. The fact is, when a ligature slips off from the end of an artery, it is always the surgeon's fault. When you apply two ligatures, take care that they do not cross each other under the artery. If pulsation should return in a slight degree in the aneurismal tumour

after the operation, you need be under no apprehension—you know that immediately after, there had been no pulsation, and its return must therefore arise from the anastomosing arteries, and which you neither can or need prevent; just apply a light compress on the tumour, and all will do very well. Bell advises you to clear the artery *very* well before attempting to pass a ligature round it, but you might carry this clearing too far. When I began to practise, I once operated for popliteal aneurism, and a more promising case I never saw. I took great pains to clear the artery from its sheath, and did it very much to my own satisfaction; but in twenty-four hours afterwards there was secondary hæmorrhage—a thing I believe unprecedented in such a case, but which determined me never again to denude the artery too much. You must make a way for the needle, and that is all you require. The great danger in the operation for popliteal aneurism is secondary hæmorrhage; you are therefore anxious to get the wound you have made to heal as speedily as possible by the first intention; you cut off one end of the ligature close to the knot, and leave the other hanging out of the wound; you draw the lips of the incision together, and retain them by strips of adhesive plaster, put the limb in an easy relaxed position, and in about from the fourteenth to the twentieth day the ligature will probably come away. This is the time that you are to watch for secondary bleeding: sometimes it is trifling in quantity, but it may recur two or three times, and yet no serious consequence follows. As disease is much more frequent in large than in small arteries, spontaneous aneurism, as might be expected, is also more frequent in the larger sized vessels.

Gangrene is sometimes a consequence of the opera-

tion, and we are told it is an *immediate* one when it does happen—that is, occurring on the second or third day; but I have known it more than once to supervene a fortnight after, and in one case gangrene did not take place until six weeks after the operation. The first symptom that makes one apprehend gangrene after the operation for popliteal aneurism is a coldness the patient feels in the limb. You examine it, and you find it pale, and its temperature lower than the other limb. Here you direct it to be wrapt in warm flannels, and every attention to be given to the maintenance of its heat. Sometimes it begins in a black spot, usually about the instep; there may be one or two such spots; if there be but one, the patient may recover; if there be two, however, or three, I believe he will not.

When the aneurism is high up in the femoral artery, and that you do not think it judicious to take it up below Poupart's ligament, or have not room to do so, you must then take up the iliac artery, and you will find it a less troublesome operation than taking up the femoral artery itself. You will be surprised to find how much it is within your grasp, as soon as the superficial parts are cut through. I took up the iliac artery under circumstances where there was nothing else left for me to do, and before such an operation had been recommended. The aneurism was too near Poupart's ligament to put a ligature round the femoral artery, so I cut through the ligament, and tied the iliac artery a little above it. As it is advisable to prevent suppuration in the wound you have made to get at an artery to tie it, lest the vessel itself should take on the suppurative inflammation, you diminish the chances of such an occurrence by cutting off one end of your ligature close to the knot, but other modes of operat-

ing have been proposed for the greater safety of the artery. Acting on the principles he conceived, Jones tightened a ligature on a large artery, and when he felt that he had divided the internal and middle coats, he immediately removed the ligature, and the vessel became impervious. Some recommend tying the vessel, and in twenty-four hours afterwards cutting out the ligature, but you will find you could not remove the ligature at this period, for lymph has been found round it, and if you wait longer to give it time to separate, it will have become faster, up to the time it would have been expected to come away, if not meddled with. You cannot remove it before, without disturbing the artery, and very much increasing the danger of the operation; nevertheless it has succeeded. Mr. Crampton invented a contrivance for the obliteration of arteries, which he called a *Presse Artere*; the first time it was used it succeeded completely; the second time it was used it was applied by Mr. Dease, and here it likewise succeeded, and the man on whom it was applied rewarded him by making a great improvement in its mechanism. He adapted a screw to it, by which the degree of pressure necessary to be given could be regulated easily. In the cases where the presse artere failed a gangrenous spot was found in the artery, on examination, exactly of the size and shape of the part of the instrument which had pressed the vessel. It has been recommended to tie the artery, cut off both ends of the ligature, and heal the wound of the parts over the vessel, by the first intention, and it is said the ligature gives little or no trouble afterwards, but quietly makes its way out, sometimes even a month after the operation. Mr. Horner of Philadelphia, invented ligatures expressly for this purpose, and had

them made of kid-skin, conceiving that the more animalized they were, the less they would disturb the surrounding parts as an extraneous body. When he was in Dublin he had the kindness to give me some of them. It unfortunately happened that some accident occurred in every case that I used them, so that I could not fairly see the issue. Some of these cases were the patients of other surgeons, who afterwards told me they had succeeded, but I should like to see an instance of their success myself before I would recommend the practice.

There is one mistake that often confuses a young man in his first operation on arteries; accustomed to dissect arteries when full of injection, he acquires insensibly a wrong notion as to the proper or natural size of them. Now, in the living body, you will find these vessels much smaller than they would appear in the dissecting-room. In clearing an artery to pass a ligature round it, keep the back of the knife as much turned to it as you can. When you use two ligatures, *e.g.*, on the femoral artery for popliteal aneurism, you tighten one first, and get your assistant to feel in the ham if the pulsation has stopped in the tumour, and be certain of this before you tie the other part, and divide the artery between the two. The reason of adopting *two* ligatures for an artery under circumstances such as we have been speaking of, was fancying that it was putting the artery in the same favourable condition in which it would be if it had been cut and tied in amputation, and to avoid any traction of the vessel, but it would not be at all in the same condition; and as to the second motive, a judicious position of the limb after the operation, and which never should be neglected, whether you use one or two ligatures, will secure all the advantages that any other

plan could accomplish. When the patient is put to bed, you place the thigh a little flexed on the pelvis, and you have the whole limb enveloped in flannel ; the ligature will come away some time between the fourteenth and twentieth day, and then it is you are to be watchful for any bleeding from the wound ; the tumour grows smaller and harder from day to day, and the patient is discharged with, perhaps, only a small hard knot remaining in the ham. For three or four weeks you should be guarded in your prognosis, for gangrene may set in after everything had been apparently going on right so long.

There are, you are aware, two principal methods adopted for taking up the external iliac artery ; one described by Mr. Abernethy, and the other by Sir A. Cooper. Whichever of those you choose, you must cut the tendon of the external oblique muscle completely down to Poupart's ligament. Should this not be done, the opening in it will be too small, and will confuse the operator very much in the subsequent stages. Care must be taken when dividing the internal oblique and transversalis muscles to get the director fairly under their margins, for if you leave a fasciculus of their fibres undivided at first, you will have to make a second incision. When you cut through the transversalis fascia, you see the peritoneum protruding and retiring with the patient's respiration ; it is not of much consequence, but, as it is not mentioned in books, it might confuse you for a moment, if you did not expect it. When you do all this, and push aside the peritoneum, you will, as I have said, be astonished how much you will have the artery in your power. The iliac artery is bound down by a fascia, in which you must make an aperture before you can pass the blunt needle under it ; you must just make the smallest

hole in it with a sharp-pointed probe, or anything else near you, and then pass a single ligature round it ; you then relax the limb, when the ligature is secured and the wound dressed, and keep it so until the ligature comes away.

Having said so much on the general principles that should guide you in the treatment of aneurism, it will not be necessary to enter further into details. I should wish, however, to mention that an artery which you might find it necessary to take up for the cure of aneurism is sometimes so deeply situated that your great difficulty will be to pass a ligature round it ; for instance, the subclavian artery is sometimes to be tied at the bottom of a deep narrow cavity, where you cannot see it, as for axillary aneurism, perhaps, in which the shoulder is very much raised and will not admit of being depressed ; in some of these you will try several of those instruments invented from time to time to meet such an exigency, and in one case, one of these will succeed, but perhaps fail in others apparently nearly alike.* When an artery is circumstanced in this way, there will often be much difficulty in drawing the ligature and tying it with sufficient tightness, and at the same time without disturbing the vessel or raising it from its bed—a thing that should always be most sedulously avoided. Every artery that

* Surgeon Trant of this city, has invented a very ingenious instrument for passing a ligature round a deeply seated artery, and bringing both ends out of the wound by its own action ; I have seen it employed on some cases with facility and success, where, I think, the common aneurismal needle would have given much trouble to the operator, and disturbance to the artery. For a description and drawing of this instrument, see *MEDICAL PRESS*, vol. II. for 1839, p. 309.—*Ed. of Lect.*

you may have to tie, will have difficulties peculiar to it, but they are for the most part anatomical difficulties, and a correct knowledge of those will be sufficient to give you courage to undertake operations on them, and afford you the best means to meet contingencies.

To expose the right subclavian in the first stage of its course will seldom be found very difficult by a good anatomist and surgeon, who does not suffer himself to be flurried, and whose hand is steady; but a similar operation on the left side will be out of the question, from its great depth, its direct course out of the chest, the suddenness with which it turns over the first rib and behind the scalenus muscle, but chiefly from the number of important parts which closely accompany, and run parallel to, this division of the left subclavian artery. The artery has been tied where it crosses the first rib, and of course the anterior scalenus had to be separated from its attachment. Now, the phrenic nerve is so connected with this muscle that there is great risk of wounding it, and I hardly think it would be advisable to undertake an operation where any risk of the kind existed. I do not mean to say that a division or other injury of the phrenic nerve *must* follow the separation of the scalenus muscle from its inferior attachment, but if it was only a possible event, much less a probable one, the danger would be enough to make us hesitate about it. There is no difficulty in putting a ligature on the subclavian artery after it has passed the scaleni muscles. When you make the necessary incisions to come on the vessel, there is one certain guide, and but one, to lead you to it. You recollect the bracheal plexes of nerves is above and behind the artery, and the lowest branch of this plexus, or the one above that again, might

readily enough be mistaken for the vessel itself, and tied instead of it perhaps. If you slide your finger on the surface of the scalenus muscle, at its acromial edge, it will lead you directly to the artery and away from everything else that might be confounded with it.

LECTURE XXIII.

ANEURISMAL VARIX—VARICOSE ANEURISM.

WE shall now proceed to consider a peculiar condition of a wounded artery in which the blood escapes, not into the surrounding cellular substance, there to form a distinct close sac, or circumscribed aneurism, nor yet to be diffused through the general cellular membrane of the limb, but to enter the canal of a vein which had been transfixed, and through which the artery had been wounded. This generally occurs in venæsection at the bend of the arm, where the brachial artery lies directly behind the median basilic vein, and the usual place where that vein is opened with a lancet is in contact with the artery. The semi-lunar fascia of the biceps muscle, although interposed between these vessels immediately below the level of the condyles of the humerus, gives the artery no protection for about a quarter of an inch at the usual place for opening the vein for the detraction of blood, and therefore they can become consolidated and a direct communication established between their canals. This disease has received the name of *Aneurismal Varix*—that is, where the opening between the artery and vein is *direct*, and the vessels, at the situation of the wound, in contact with each other. There is a variety in the consequences of this accident called *Varicose Aneurism*—that is, where the blood insinuates itself for a short distance into the cellular substance between the artery and vein, around the corresponding wounds in each, and the formation of a little aneurismal sac, with openings into both vessels,

and of course transmitting the blood from one into the other.

After this accident occurs the wound in the integuments, and the corresponding one in the vein, may heal readily; a part of the blood transmitted by the brachial artery, instead of taking its destined course to the forearm, passes into the transfixed vein, and, following the course of its blood, is returned to the heart. In such a case there is a pulsating tumour formed, but its pulsation is so different from that of a true aneurism that the nature of the injury can be distinguished with the greatest ease; there is a thrilling or whizzing sensation not easy to describe, but which if once felt, can never be forgotten—it is as if you felt the effort of a fluid forced through a narrow orifice, and communicating a vibratory motion to the parts, so that if one's eyes were shut, and the hand laid over the part, it would be recognised at once. It is said that the vein under these circumstances is always varicose, but you will see many cases of aneurismal varix where the vein is not the least varicose. I have seen a case where the tumour had this whizzing feel, and where the vein could not even be seen, but if you felt the vein along its course in the arm, you could feel the thrill to a considerable distance; if you applied a piece of metal, or the stethoscope along the vein in the arm, you could distinctly recognise this peculiar feel and sound, so that it is not at all confined to the tumour. I saw a curious case once where the disease existed without any tumour at all. It was the case of an officer who had been engaged in a duel, and who, on leaving the field, was obliged to conceal himself; he was bled that evening, and had to be bled in the dark. The army surgeons, and the army medical boards in London and Paris, considered it a

case of aneurismal varix, and treated it accordingly. I saw him, and am confident they were right ; but the most curious part of the business was this—the basilic vein was not affected, but the cephalic had the whizzing. Well, all he complained of was that he could not play rackets as he used to do, and I advised him not to attempt it. He did, however, play them, and hard games too, and at length he got a severe pain in his arm. I saw him in about a month afterwards, and his disease was gone—the inflammation that had been excited by the exercise had cured him. How the blood had got from the bracheal artery into the cephalic vein I do not know, except it was some irregularity in the vessels. After this injury has existed for a while, the artery below the wound in it becomes diminished in capacity, but above the injury it is often found larger than the corresponding part of the bracheal artery of the other arm.*

* I saw, several years ago, a very singular case of enlarged veins in Jervis-street Hospital, under the care of Mr. Adams, and afterwards transferred to Dr. O'Beirne. The enormous tumour of varicose veins, as it was supposed, occupied the posterior part of the thigh, extended downwards to the calf of the leg, and projected outwards and backwards several inches ; it scarcely impeded him in walking, or interfered with his usual occupation, which was that of a field labourer. There were four or five venous trunks, fully as large as the vena cava, about the knee, and numerous others, as large as the vena porta ; but the most remarkable circumstance connected with the case was, that every one of these veins had the *thrill*, or jarring feel characteristic of aneurismal varix ; beyond this, however, there was nothing to warrant one in supposing that these veins communicated with an artery. A cast of this very remarkable case was, I believe, presented by Dr. O'Beirne to the College of Surgeons. The patient was a man about forty-five years of age.—*Ed. of Lect.*

Sometimes, instead of a direct communication between the artery and vein, such as I have described, a little blood makes its way between these vessels into the cellular membrane connecting them naturally to each other, and the consequence is the formation of a true aneurismal sac, having the peculiarity of two openings—one connected with the artery, and the other with the vein. As this does not interfere with the freedom of passage of the blood from one vessel into the other, there is not the same tendency to enlargement and ultimate bursting of this sac as there is in ordinary aneurisms. This variety, which is called *Varicose Aneurism*, occurs in fat people, where the vein and artery are naturally separated a little from each other, or probably from some accidental disturbance of the relative positions of the vessels after the occurrence. The blame of transfixing the vein and wounding the artery is generally left on the patient, but mostly unjustly, for his impulse at the moment of the puncture is not to thrust his arm forwards against the lancet, but just the reverse. I do not know any practical difference between aneurismal varix and varicose aneurism. In either, the patient complains little, or not at all, of any pain or uneasiness on account of it; and, therefore, as far as practice is concerned, there is very little in general to be done; in fact, an operation is entirely unnecessary in either case, for the only inconvenience felt from it is that there is not as much power or freedom in the use of the limb as there was before the accident. Now, this would be insufficient to authorise an operation in most cases. I have, however, operated in some of them, and have seen the operation done by others very often, with success, and never saw an instance where it was necessary to lay open the aneurismal

sac, as some advise, nor of course to apply more than one ligature, and that round the bracheal trunk above, and close to the tumour. You will bear in mind that aneurism from a *wounded* artery differs in this essential particular from *spontaneous* aneurism, that the vessel is sound in the former, and almost always diseased in the latter. In the first, we can tie the artery close to the opening in it, by which we insure a more free anastomosis; in the latter, we must tie the vessel at some distance, to ensure a sound part for the application of the ligature.

There is still one species of aneurism I have not mentioned, called *Aneurism by Anastomosis*. This disease is sometimes congenital; it appears under two very different circumstances—in the one, there is tumour and pulsation synchronous with that of the arteries; the skin is of a bluish colour: it is very soft, and occasionally is met with having the feel as if it was a thin capsule filled with worms; it is often seen even of large size, without throbbing or pulsation, but anger, or any physical exertion, will swell it out much beyond its accustomed dimensions, and will even sometimes burst and discharge a great deal of blood in a few seconds. It sometimes is indolent in its nature and progress; at other times it will be the reverse. If the skin over one of those tumours be abraded, or if a puncture be indiscreetly made into it, it bleeds with most extraordinary fury, and the hæmorrhage is extremely difficult to suppress. Although a similar structure may be found in some of the internal parts of the body, yet their seat is more generally under the skin, or in the substance of the skin: and the parts about the face and neck appear more generally attacked than others. This last observation may not be quite correct, for as the disease

may exist long, or during the patient's life, without giving him any uneasiness, few will be likely, under such circumstances, to apply for surgical aid, or undergo a painful process unless it be in a situation to cause deformity, particularly in females, who, by the by, appear to me rather more subject to the complaint than the male sex. Although they are soft to the touch, and the skin over them perhaps a little corrugated when no excitement is present, yet if any takes place, or that they are in any degree irritated, they will become greatly swollen and tense. There seems no disposition in these tumours to grow well of themselves; they either remain for years stationary, or continue to enlarge, often to a great size, both in circumference and prominence, and may carry off the patient by hæmorrhage, or taking some other form.

In the second variety there is no tumour or pulsation, nor will it bleed on being punctured; and besides these differences, there is another very strong one—namely, that we can cure it without an operation; if it ulcerates, the ulcer is even indolent, and the original colour of the part disappears. This second species is sometimes so large that an operation for its removal, if even necessary on other accounts, could not be practised; I have seen the whole side of the buttock affected, or the side of the face or head. Where it is of moderate size it can be removed by blistering repeatedly; of course if it be of very great extent, you will judge how far it may be blistered with impunity.

Respecting the first kind, the case is to be treated in a totally different manner. Some of them have been cured by tying the arteries going to it, but I have seen this fail, although indeed it for a time re-

lieved the disease ; but all the bad symptoms returned.* The only certain cure is to remove the entire tumour if possible. Some of these cases of aneurism by anastomosis remain for a long period without any alteration. I have watched one for, I am sure, twenty years, without its having undergone the smallest alteration of size or condition. Bell is right in saying that you must not cut *into* one of these tumours, but cut it out, and that without leaving a bit of it behind ; and yet I once assisted an old surgeon, whose sight was bad, to remove one of these, and he left a bit of it behind as large as a black currant, yet the disease did not return. The quantity of blood poured out on one of these being wounded, is, as I before said, astonishing, but if you come to examine one of them, suppose no bigger than a walnut, you will find two or three arteries going to it, each as large as the radial artery. There is something peculiar in these arteries, something different from ordinary arteries going to a normal part ; for when divided they never require a ligature to repress hæmorrhage. A slight pressure with the point of your finger on the vessel, for a couple of minutes, effectually stops the bleeding from them permanently. In removing one of these tumours, therefore, you need never wait to take up

* I saw the late Surgeon Wallace tie the external carotid artery for one of those erectile tumours which extended from about midway between the zygoma and angle of the jaw downwards and forwards into the sub-maxillary space, and across the lower half of the masseter muscle nearly to the chin, in a healthy young girl ; the operation effected nothing whatever. The late Mr. Hallahan and myself tied two large vessels going to a small tumour of this description which diminished it by one-half, but in six months there was no farther improvement.—*Ed. of Lect.*

these vessels. There is one rule you must observe in removing this disease with the knife—cut it out with the utmost rapidity. Two or three instances have occurred in London, where the patients actually died under the operation, and I cannot conceive any cause there could be for such an event, except the want of the necessary celerity in the surgeon during the operation. Pressure has been employed for the cure of these cases, and the proceeding has, it is said, succeeded in some instances where the tumour was small and in a favourable situation; it must be made firmly, and the pain caused by it in consequence often obliges the surgeon to remove it before any advantage could have been gained. In fact, the knife alone can be relied on confidentially for the removal of this form of aneurism by anastomosis, and its employment is not unattended with danger in young subjects, or in a large tumour, unless the operation be performed with celerity and care.

LECTURE XXIV.

CANCER—CUTANEOUS CANCER—SCIRRHUS.

HAVING now concluded what I had to say on the subject of wounds, I will proceed to consider surgical diseases, and shall begin with *Cancer*. I must, in the first instance, premise that I shall have to speak of many diseases not cancer, but which have, from time to time, been called cancer, and confounded with it. There are two states in which cancer may exist—one, ulceration; the other called scirrhus, where, from beginning to end, there may be no ulcer at all, although scirrhus will always have the tendency to ulcerate—will always end in ulceration if the patient lives long enough. Nevertheless, patients may and do die of scirrhus without any suppuration, ulceration, or of course any absorption of cancerous matter ever having taken place, or even the skin over it being in the least discoloured, but this is not the usual course, for it seldom terminates fatally before it is ulcerated. The first stage of cancer will differ in its appearance according to the structure of the part where it begins—that is, whether it begins in a glandular part or in the skin or mucous membranes; but there are distinctive characters assumed by the disease, sooner or later, that are common to it every where. The *Cutaneous Cancer* may be met in any part of the body, but there are certain situations where it is more frequently met with than in others, as in the lip, the nipple of the breast, the scrotum, &c., but this form of the disease is, on the whole, less common than the

scirrhus or glandular form. Cancer is rather a disease of advanced life, but there are some parts of the body, and perhaps some forms of it, in which it is met at earlier periods than others comparatively. When in the skin, its first appearance has not an uniform character, it sometimes comes on after the meridian of life in the form of a wart which remains a few years stationary. Well, if this wart be on the face, for instance, the patient perhaps picks the wart off, or if it is on the chin, shaves it off, a new one comes on the part, harder to the feel than was the first; this is, in its turn, picked off, and another again appears in the same place, and so it goes on. The interval between the falling off of one, and the formation of the next, grows shorter and shorter every time; at last the part becomes hard and ulcerated. This wart may arise in any part of the body. I never knew it to come on in this form under the meridian of life, except in one instance, where I think I saw it at an earlier period on the prepuce. Cutaneous cancer commences in another form—that of a fissure, as in the lip, which is generally at first mistaken for a cold, and some ointment or other application is put to it. After a time, however, it becomes puckered in appearance, and after this ulceration very soon follows. The edges of this fissure, if cancer, are very hard; if it should be a common fissure without any thing malignant in it, and some people are very subject to such, it will generally heal up in two or three days by frequently rubbing it with oil, but not so if it is cancer. Caustic applied to a venereal ulcer of the lip will induce it sometimes to heal, and so far it might be confounded with a cancerous ulcer, but that their seat about the mouth is never the same, at least at the commencement. The upper lip is subject to

an ulceration of a peculiar kind ; it begins by a scab on the lip, or perhaps on the nose or cheek ; when these fall off, the part discharges a viscid, greenish, tenacious matter at the early periods ; generally the ulceration spreads rapidly, and in three months it will have destroyed the lip, nose, and part of the cheek ; if it is not meddled with it will heal up spontaneously, after destroying a certain quantity of the parts it had invaded. But there is a strong line of distinction between this and cancer ; it begins at an earlier period of life than cancer does : it wears itself out, which cancer never does ; and yet there has not been discovered any mode of treatment, local or general, that can be in the least depended on for arresting its progress. I saw a boy of the name of Brien in the House of Industry, about fourteen years of age, who had suffered from this, and notwithstanding every attention that was paid him, and the trial of everything that promised the least hope of success, it ate almost the whole front of his face away.

This form of cutaneous cancer I have described in the lip, occurs sometimes in the breast, usually at the nipple, and is then accompanied with a coffee-coloured discharge, or the oozing of a little blood from it, and this is one of the worst forms in which it begins ; so closely does it resemble another disease (*fungus hæmatodes*) at this period, that, for some time, one cannot well say which it will turn out to be. One of the worst possible cases of cancer you can find is, where, in the beginning, the nipple, which should be prominent, becomes retracted, and where every motion of the arm causes a feeling of dragging at the nipple. Cancer of the lip may begin in a fissure, as I have said, or in a wart or a scab : there are more instances of its occurring in early life in this situa-

tion than in the breast. It is a curious circumstance that cancer does not originate ever in the upper lip : it may begin sometimes, although not often, at the angle of the mouth, and then extend from that to the upper lip, while a venereal ulcer, with which it might sometimes be confounded, as constantly begins in the upper lip. There are other distinctions between these two diseases about the mouth which we shall consider on another occasion. In cancer of the lip it is a remarkable fact that the older the patient is on whom you operate, the greater will be the chance of there being no relapse. In nearly half of those cases operated on, it is true, a relapse does follow, but it is often owing to the previous treatment, such as the application of caustics, arsenic, &c., and these applications are quite fair to make trial of, for arsenic and corrosive sublimate *frequently* do cure it in this situation. In old men there is sometimes a condition of the skin in which there is a number of dark-coloured scales on the face, of the size of the point of the finger : these scales fall off, and others come in their place, each succeeding crop being thicker than the last, and at length an ulcer makes its appearance, and this is called cancer, but it is not cancer at all. This sometimes rests on the nose, and at length scoops a piece out of it ; it may exist for years. The surface of the ulcer formed in this disease is perfectly glazed and polished, without the slightest appearance of a granulation on any part of it, and its margins are thin and hard. A man may die of this disease, but it is not cancer nevertheless. The cutaneous form of cancer is milder in its symptoms than the glandular.

Scirrhus of the female breast never by any chance occurs before the age of thirty-five or forty years. We see some of these cases about the age of forty-

five, or from that to the sixtieth year—from fifty to fifty-five is perhaps the most common age. Scirrhus in the breast often comes on without giving any notice of its approach. In passing the hand over the breast, the patient feels perhaps a lump, which, in the beginning, is indolent, and gives her no pain or uneasiness of any kind. If you press it at this time it gives no pain, nor has it any attachments either to the parts on which it lies, or to the parts which cover it. It is smooth on the surface, but even at the earliest period there is an extraordinary hardness in it, and if it is in a dependent part, where you can poise it on your hand, you are sensible that it is heavier than other tumours. As it becomes large its surface gets knotty and uneven; and as it grows still larger it fixes itself by adhesions, either to the parts behind it, or to the skin; but much as one reads of the attachment of a scirrhus tumour of the breast to the pectoral muscle, I do not think they are adherent to that muscle in one case out of five hundred. In almost every case where such an adhesion has taken place, the disease will turn out to be fungus hæmatodes. When it forms these adhesions, then it is that the patient feels first those peculiar stings called lancinating pains, and which she describes as if a needle or lancet was thrust into it. At first a sting of this kind comes in it but once in five or six days, and is but little noticed, and soon forgotten. It is a curious circumstance that while you are examining the tumour, you give no pain, but generally in some short time after you handle it the pains are felt, and are more severe than at other times. When the scirrhus tumour becomes adherent to the skin it seems to become smaller, or to have receded from the surface, in which there is rather a depres-

sion than tumefaction, from the removal of the adipose substance, by absorption, that had until then been interposed between the skin and the tumour; the skin now has perhaps for the first time altered its natural colour and appearance; it becomes of an unhealthy red hue, becomes rough or tuberculated, and it is generally at this period that lymphatic glands in the neighbourhood become enlarged and painful; the skin has evidently partaken of the disease, for it is dense and brawny at the part; sometimes it seems as if about to suppurate, but it quickly opens into an ulcer. Long before this, however, the glands in the axilla become enlarged; you may find one or two between the ribs, or under the border of the pectoral muscle, or *in* the pectoral muscle, or above the clavicle, or at the side of the sternum; wherever you meet them they are very hard to the feel.

Of all the forms of cancer met with, the very worst is that in which the glands of the axilla exhibit the first appearances of the disease; they are by far the worst cases met with, where the breast becomes affected *after* the axillary glands. The mildest cases are those which originate or come on after a hurt; but you cannot be certain, from the accounts women give, as to hurts they may get in their breasts. They are fond of playing with children, and they may think they get a kick from the child. There are few of them who will not recollect some little bruise or hurt they one time or other received, and any of these may or may not have been the immediate cause of the disease.

Now, there are some affections of the female breast liable to be mistaken for cancer, and it is of the greatest moment to discriminate between them. Many a breast has been amputated without any ne-

cessity, from want of taking proper care to distinguish these cases from true cancer. A woman has had a relative—either an aunt or a sister, suppose, who died of cancer in the breast, and if she gets any tumour in this part, she will think it must, of course, be cancer too. Women nursing are subject to a very extraordinary affection of the breast—it is this: the breast swells, soon becomes painful, and some time after this, is felt hard, but not of the stony hardness of scirrhus, and unaccompanied with the lancinating pains; this tumour will be found to consist of a sac, containing a fluid, in every particular resembling milk. A lady, the sister of a medical man, came to me with a tumour of this kind, and on examination, and she being young, I was satisfied it was not cancer; I made a puncture into it with a lancet, and let out a little of this fluid, which I believe to be milk, and she got well rapidly, and without any return, although she had the complaint twelve months before I saw her. Sometimes hydatids form in the female breast, and cause tumours as hard as true scirrhus ones, but they can be cured by pressure. How are you to distinguish between hydatids and scirrhus? When the tumour is not uneven on its surface it is probably not scirrhus, but even as regards its rugged or unequal surface, we are not always able to judge: for if two or three of these hydatid tumours, which, in some of their characters, are like scirrhus, should lie close to each other, we might confound them as one irregular tumour; but if we can distinguish them as separate tumours lying in the neighbourhood of each other without being joined, the case is most certainly not cancer; the hydatid tumour is not so large as the scirrhus tumour for the time it existed. We are able to trace in almost every affec-

tion of the mamma, some connection, directly or indirectly, with the uterine functions, and that the great events in that organ, such as the first menstruation in youth, its cessation in age, or pregnancy, or its condition during the suckling of the infant, are frequently attended with derangements or diseases of the mamma, in a great degree peculiar to the conditions of the uterus alluded to. Now, there is one affection of the breast which often occurs to young girls at the commencement of menstruation, but which may occur at any period until that discharge ceases entirely in old age, that might be mistaken for scirrhus. Some pain is experienced in the breast, and a tumour is perceived, generally about the inferior margin of the breast—it is a small glandular tumour. When you feel it the patient winces; when she suffers much uneasiness of mind from any cause, the swelling becomes more painful; she finds it impossible to wear her clothes tight, or to suffer any pressure on it; the pain increases, and the tumour becomes larger at each period, just as she is going to menstruate; it becomes easier when the discharge ceases, and remains better until the next period. When these persons get married and become mothers, the affection generally disappears; but this is not always the case, for I have seen it continue in a female who was a mother. There is no malignancy whatever in these cases, and although they create much alarm and give a good deal of bodily uneasiness, they never turn to any thing bad. I have known some of these cases to last for thirty years without any perceptible alteration of character. They can sometimes be traced to a slight injury. I do not know what will cure this affection, but there is one method of treatment which I have never known to fail in giving ease to the patient

whenever it became painful—viz., to mix about equal parts of ether and spirits of wine together, dip a feather in this, smear the breast with it, and leave it uncovered to evaporate. Scrofulous tumours and ulcerations may, of course, form in the breast as in any other gland, and such a tumour or ulcer is very difficult to distinguish from scirrhus; there is no *single* symptom that will do it. If the patient, however, was under the age of forty, I should doubt it to be cancer, but should have apprehensions as to what it might become if the patient was beyond her forty-fifth year. In this scrofulous tumour of the breast you will fancy sometimes that there is an irregular feel about the tumour, but if you move the part from side to side, you will be able to discover that it is only that natural irregularity which can be felt in almost every breast; the state of the patient generally, and the history of her complaint, will go far to elucidate the case, such as the progress it took, the kind of pain accompanying it, if the lymphatic glands in its neighbourhood have sympathized, and particularly the condition of the skin over the tumour. I am inclined to think that scrofulous persons are rather more disposed to cancer than others. Sometimes you are called to see a tumour in the breast, and not being able to settle in your mind whether it is cancerous or scrofulous, you are allowed to call it an anomalous tumour; these anomalous tumours will yield to calomel and cicuta. I have found great benefit from rubbing over the part the hydriodate of potass ointment, particularly in one case where I lately tried it, and where the cure was certainly very unexpected, as I apprehended it was true scirrhus. If the tumour has formed suddenly, and is accompanied with inflammation, leeches will be of service. There is another

affection of the breast that may be mistaken for cancer. One of the breasts begins to grow large, and continues to increase, until, at length, it attains double the size of the other; it is not accompanied with much uneasiness. Investigate the case, and you will find that the patient has some affection of the uterus, not, perhaps, amounting to cancer, and that this condition of the breast is merely a sympathy with the uterine disease, appearing after the stoppage of the menses. It is not cancer, and you should not undertake any operation for it. It is possible, sometimes, to confound matter forming in the breast with cancer.

Now, when we have ascertained a case to be cancer, how are we to treat it? Why, we are at a loss how to treat it. It makes the greatest difference possible in the case, whether the scirrhus tumour be connected with the skin or not; where it is connected with the skin its progress is more slow, and the disease is more extensive; when the tumour from the commencement is much connected with the skin, either adhering to it, or the integument over it thick, like the skin of a dead pig, without discoloration, the progress is here more slow, the ulceration is more superficial, the skin rises up in grains, those grains enlarge, and the affection will sometimes extend all over the body, down the limbs, and often puts on the appearance of anascarca; but if you feel the skin, it has not the smooth soft feel that you find in common dropsy, but is every where diseased, as I described. I was, not long ago, consulted by letter, to know what I would recommend to cure a general dropsy, and on investigation it turned out to be this form of cancer. Why, in a case of this kind, you can do absolutely nothing. Pressure has been recommended to dissipate a scir-

rhous tumour ; its use will, no doubt, in many instances, apparently diminish the size of the tumour, but it only makes it flatter, extends it diametrically, makes it adherent to the surrounding parts, and throws the disease in on the chest. The internal remedies for cancer have been very numerous, and each succeeding one, after all the promises of its inventor, was sure to be superseded by some other infallible cure, that turned out as ineffectual as its predecessor. Arsenic, given internally, had a long run ; hemlock had its day ; mercury, opium, bark, iron, and numerous others, embracing every class of medicinal agent, took their turn ; and all I need say of their efficacy is, that no practical man of the present day places the least reliance on any one of them for the cure of cancer. But for the relief of those symptoms that render cancer so dreadful in its progress, to mitigate the horrible pain many suffer, both in the affected part itself and in other situations, to correct the foetor attending the disease, particularly in some situations, and which would be in itself enough to make the unfortunate person's life miserable, and for other purposes that occasionally spring up in individual cases, medicines and local treatment should on no account be neglected. Opium, hemlock, hyosciamus, and other medicines of this class, often afford great relief from pain, and this, besides being so inestimable a blessing in itself, retards perhaps the progress of the disease. No constitution, however strong, could bear up against such unmitigated suffering half the time that we see some of these cases last under a soothing plan of treatment ; but there ends the benefit that alone can be expected from them.

LECTURE XXV.

SCIRRHUS, CONTINUED. FUNGUS HÆMATODES.

THERE is considerable variety in the recommendations advanced by writers for the treatment of scirrhus, by means of external applications; they are deserving of a little more attention, because as palliatives to the more urgent symptoms they will be found of great use in the progress of a case, and because cases have been cured by topical treatment without operation. I mentioned already the effects of *pressure* on a scirrhus tumour. Now, slight inflammations will appear, and are a great aggravation of the patient's condition, for besides the fever and local soreness they cause, the peculiar lancinating pains are generally worse at such times than at others, and to relieve these the application of a few leeches are of great service; the patient generally experiences ease for a week or fortnight afterwards; but they do nothing more. Putting leeches to the skin when really engaged in the disease, is, however, not quite safe, for the leech-bites may ulcerate and become cancerous sores. This, however, is not so common a consequence of their application, under other circumstances, as to make us disregard their beneficial effects; but I would advise you never to order leeches to be applied on the skin over a scirrhus tumour unless they be perfectly unadherent to each other, and the tumour itself be moveable. Poultices of hemlock have sometimes appeared to give local relief, and so, it would appear, have applications of cold water; but it is

only temporary. Powerful caustics, such as were capable of destroying the vitality of the part, have cured certain cases of cancer by sloughing, but of these I shall have to speak more, presently. The removal of a scirrhus with the knife is the most likely means of freeing the patient of the disease, but there are circumstances that may attend cancer which would not only render the operation wholly ineffectual as a cure, but would cause it to aggravate all the symptoms, and accelerate the patient's death.

Where the skin over the tumour is hard, and the line between this diseased part and the sound skin is not clearly marked, never operate in that case. If the skin is concerned only to a short distance, and if the patient is very importunate, you may operate, but this will be the consequence, that in a few months she will return to you with a relapse. A case is sometimes met with of a woman, about forty or fifty years of age, who will have one of her breasts enlarged, and it becomes a large globe of scirrhus. Now, if you operate on such a patient she will die in a week—she will be seized with something resembling erysipelas, and will die in a week. I would never recommend you to operate if the patient exhibits signs of a cancerous diathesis—that is, if her health is generally deranged—if her skin has a leaden or pale yellow hue, with quick pulse, pains like colic, an obstinate constipation for perhaps two or three days, and then a diarrhœa coming on with griping pains—if the patient complains of pains in her joints, which come on irregularly, and not like rheumatism, being at one part of the day better than at an other, accompanied with a wasting of the flesh, with a teasing, tickling cough, and variable appetite—that patient has the cancerous diathesis in full operation: and whenever

such is present, and particularly when the leaden cast of countenance appears *at an early period* of the disease, abandon the case—never operate there. In any case where you are not sure that you can remove the *entire* of the diseased part, never think of operating. Now, if it has deep adhesions, you cannot do that; to examine if the tumour be adherent to the great pectoral muscle, you put the fibres on the stretch by throwing the shoulder and arm backward; you then grasp the tumour in your hand and try to move it in the direction of the fibres of the muscle. If it will not move freely in this direction, then try to move it more in the perpendicular direction, and if it should, you find the muscle move with it, but if it seems fixed in this direction also, you may apprehend it has formed adhesions to the deep pectoral or to the ribs. If at all adherent, I would advise you not to undertake the removal of one of those tumours with the knife; the result will be only disappointment to you and the patient, as indeed it will unfortunately be likely to be under the best circumstances. When the glands above the clavicle are affected, I would not advise you to operate—not because they could not perhaps all be removed, but when these glands are affected, the parts within the chest are generally engaged likewise; and if the patient has a thick breathing, a tightness in the chest, or a short dry cough, do not operate on any account. If the operation for removing a cancerous breast be deemed proper, the sooner it is done the better—not, as some would suggest, to wait for ulceration to occur, for, as I before said, the patient may die before this ever takes place. For my own part, it is an operation I would not press on a patient or her friends at all. It is one by which very little service is rendered at

any time. After submitting to it the patient will get a relapse, and generally sinks within two years. The longest time I ever knew a patient to live after the extirpation of a cancerous breast was four years. The only case I should entertain hopes of success in the operation would be in a woman above sixty years of age. This case will be found occasionally to remain well. Sometimes, on the third or fourth day after the operation, when you remove the dressings, you find the wound looks well, and everything seems to be going on as you could wish, yet perhaps that patient will die the next day of internal disease. If, some time after the operation, the disease returns in the cicatrix, you should never attempt a second operation. Well, suppose a case of true scirrhus not unfit for removal, and suppose the tumour be small and the breast large, are you to cut out the tumour, or remove the whole breast? It has been said if you cut out a scirrhus tumour from a breast, of what use is the remainder? and you must admit there is none whatever, but a chance that some of the disease may have been left behind. I think you should remove the entire breast—it is by far the safest and best way, but after taking the whole gland away, never think of uniting the lips of the wound by the first intention; fill the wound with charpie, and you may calculate always having as ugly a case of suppuration as you ever saw. In amputating a breast you must not attempt to save skin, unless perhaps the tumour is seated very deep, and there appears no chance of its being contaminated. Whether enlarged glands can be felt in the axilla or not, the incision should meet near it, as you cannot always tell positively at first whether you may not have to cut into that cavity; and besides when the wound is in the direction of the fibres of

the pectoral muscle, the matter will more conveniently escape as the patient lies on her side. You should make two curved incisions, one above and the other below, leaving an oval piece of skin between them, and dissect out the gland, either in the direction of the fibres of the pectoral muscle, or in whatever direction seems most convenient to you at the time. You take care to remove every particle of the disease, but after the breast has been removed, in feeling through the wound for the remains of any of those callous bits that may have been left, take care that you do not mistake the end of a divided artery, which has ceased bleeding, for one of them. A great deal of the ease with which this operation is performed depends on the depth to which you go in your first incision. If you go on snipping little bits here and there, you have no notion how the operation will be protracted. Cut through the skin and down to the surface of the pectoral muscle at once, and you facilitate everything, and avoid a great deal of confusion. Surgeons differ in opinion as to whether it will be best to dissect away the mamma from above or below. I think if the line of the incisions be in the proper direction, the rest is of little importance except as a matter of convenience, and in this point of view the first course will probably be preferable.

Sir E. Home is of opinion that secondary hæmorrhage is peculiarly liable to occur after the operation for cancer. My own experience does not at all agree with this opinion. In the operation you will divide some arteries, keep your eye on them, let an assistant lay the point of his finger on that which continues to bleed, and take them up when the operation is over. If they should not bleed when you wish to take them up, invite the bleeding by the application of a sponge

wrung out of warm water. After you remove the breast, again feel in and about the axilla, for although before you made any division of the parts, you were not able to discover any diseased glands, yet now you may discover a cluster of them, (rather small perhaps) but very hard. In cutting into the axilla it is very dangerous not to make a free external incision; you must give yourself plenty of room, even carrying your incision down along the arm for some way. It will be next to impossible to distinguish several small arteries that come in the way of the knife, but the thinness of their coats renders veins visible enough, and when you see large veins running in the way of your knife in the axilla, you may be sure they are accompanied by arteries, and if you divide them incautiously, you will often have great difficulty in taking them up, for they will retreat into the loose cellular substance where you can hardly follow them. When you meet any of these vessels, therefore, put a ligature round them, veins and all, and then divide them. When you are dressing the wound, do not put too many compresses and bandages on, for there may be secondary bleeding which these will conceal. I have known the entire bed and bedclothes, and even the floor under it, wet with blood, unknown to a careful nurse-tender who sat all the time beside the patient. The attendant should from time to time put her hand down the side to the back of the patient to feel if there is any wet, and if so, to examine if it is blood. In cutting into the axilla, keep in your memory that you are surrounded by blood-vessels; at the pectoral margin you have the long thoracic artery—behind, a large vessel, the subscapular artery—internally, the other thoracic arteries, and externally, towards the humerus, the axillary vein and artery—a wound of

either of which would cause the immediate death of the patient. Remember, also, that patients cannot bear the loss of much blood in this disease—I have known a patient to die on the table from the loss of a very inconsiderable quantity of blood from the subscapular artery. Recollect that when an artery is wounded here, it is anything but easy to come at the bleeding mouth to put a ligature on it. Now, if you feel one or two diseased glands, where it is dangerous to remove them with the knife, and they must not be left there, or your entire operation will be fruitless, what you should do is this: Put a ligature round the part by which they are held in the cavity, and tie it tight, then insulate the gland by putting some lint round it, and leave it so until it falls off. If you do not insulate it in this manner, although you have interrupted its usual supply of blood, arteries will shoot into it from the surrounding parts; it will continue to be as well nourished as before, and you leave the disease behind you.

When scirrhus ulcerates it does not *immediately* take on the characteristic appearance of a cancerous ulcer—some weeks elapse before it looks like one. When it opens a fungus shoots out; it is not like ordinary fungus; it has the rocky hardness peculiar to this disease. This, after a time, sloughs off, and an ulcerated surface, sooner or later, presents itself having these characters; it is hollowed into irregular pits; its edges are sometimes, or at some parts, inverted, at others everted, but always hard and raised above the surface. In one part of the ulcer you see it covered with something like healthy granulations, and in another part hollows full of ichor; it discharges a large quantity of a watery-looking fluid, and it secretes a glutinous one which adheres to the surface of

the sore. When the ulceration proceeds in one direction for a time, there comes a raised line, and the ulceration appears to end in that direction and takes another, and thus it goes on, until, at last, a blood-vessel gives way, and the patient often dies from the loss of a very small quantity of blood; sometimes a patient with this sore sinks rapidly—sometimes she will go off gradually, after lingering under an irregular and ill-marked hectic—that is, with a pulse somewhat quick, appetite impaired, bowels deranged, but without a regular morning and evening exacerbation; sometimes, for weeks, the patient will suffer the most dreadful torture with pains in one or both thighs, deep in the very bones, as it were, and she will say that she does not mind the little pain of her breast if she could only get some alleviation of those dreadful pains in her limbs. The mind also begins to waver from the fever and pain, not often, however, amounting to delirium. Sometimes they go off as if exhausted, and without any warning; sometimes they go off with some affection of the lungs, with a dry cough, oppressed breathing, inability to lie down, &c. The time for the re-appearance of the disease, after losing the breast, varies; but you will be again consulted, and you find a small tumour near the seat of the former disease, perhaps in the cicatrix, or you may find two or three of them. If you set about a new operation to extirpate these secondary cancerous tumours, the consequence invariably is, that you only make the progress of the disease more rapid.

Men's breasts are likewise subject to cancer in old age; I never saw it operated on. Its progress, consequences, and treatment, are precisely the same as in women; but you meet an hundred cases in women for one in men.

In cutaneous cancer, wherever situated, the knife should never be employed. Here caustics often effect a cure, but of course if the caustic you apply be in powder, or if you use arsenic, &c., it can have no effect on the dry skin. It is in the ulcerated state, therefore, of the cutaneous cancer that they can be of use. The very best application, in my opinion, is Plunket's powder, the composition of which you will find in your books, but it is chiefly arsenic; care must be taken that you do not apply arsenical preparations to too large a surface. I have seen a patient killed by the application of Plunket's powder to a small cancerous ulcer on the root of the thumb; he died, poisoned by the absorption of the arsenic, in eight days after its application. I would never apply it to a sore exceeding an inch in diameter. On every occasion where you apply arsenical preparations watch narrowly their constitutional effects. A friend of mine in the country prepares the Plunket's powder for me, and sometimes I do not find it strong enough, in which case I increase its strength by the addition of corrosive sublimate. Remember this, whatever caustic you employ, it must be strong enough to destroy the part in *one* application; if you only use it weak you excite fever and irritation, and certainly forward, instead of destroying, the disease; and, not only this, but you render all future local treatment unavailing. Plunket's powder, then, will have no effect on a dry wart. The way I use this preparation is this: I sprinkle the powder over the sore, I then smear this over with white of egg, and lay some gold-beater's leaf over all; this, shortly after its application, excites the most exquisite pain. The whole is to remain on untouched for eighteen days. Potassa fusa, or butter of antimony, will sometimes answer the purpose.

Cancer of the testicle is not a very common disease, and many a man, I suspect, has lost his testicle for a supposed cancer, where no such thing existed. We shall leave this, however, as well as cancer of the penis, &c., until we come to speak of diseases of those organs particularly. Escharotics will often cure cancer of the lip, but it takes away a piece out of the lip, and when it does this the patient can never afterwards take a drink; he can take a sup, but he will never take a drink. I know a gentleman to whose lip the escharotic was applied for a supposed cancer, and after leaving him in this predicament, the irritation caused by the remedy brought out a plentiful crop of venereal eruption. You may make very free with the mouth when you use the knife for the extirpation of a cancer there. In one case I removed nearly the entire of the under lip, and in fact his whole mouth was made up of the upper lip, yet, after a time, there was less deformity than could have been supposed possible.* Before undertaking the operation on the lip, examine

* I saw once about two-thirds of the under lip removed for cancer in an old man in the Meath Hospital. It was the second time the patient had undergone the operation; the first time it had been done in the usual way, but the second time a piece of integument, about the size necessary to fill the vacancy in the lip, was cut from under the chin and merely retained by an isthmus of skin about two lines broad, which was twisted in bringing the excised part, to which it was attached, up to the level of the deficiency in the lip. There it was retained, and its edges kept in apposition with the cut ones in the lip; it united, but its edge was below the edge of the rest of the lip. The deformity was inconsiderable, and the only thing odd-looking was, that while the beard on the portion left of the true lip, and on the chin, pointed as usual downwards, that on the new piece pointed upwards.—*Ed. of Lect.*

if the neighbouring parts are contaminated. I do not know why it is so, but the first parts affected by the disease in the lip are the chain of lymphatic glands in the line of the fascial artery; the next place is in the vicinity of the submaxillary gland. Now, you may say the extension of the disease to these parts can make little matter, as they could be removed without much difficulty; and, if everything else was favourable, this complication surely should not stop me. Well, suppose you feel the submaxillary gland very hard, you make an incision over it, and presently you are in the middle of it, and find, notwithstanding its hardness, that it contains a quantity of a dirty yellow fluid, and then you have, very unsatisfactorily, to endeavour to remove as much as you can of the diseased capsule. If the cancer had extended to the jaw-bone, and involved it in the disease, it would be a very unfavourable case for operation. In dividing the lip take care that you cut fairly through it, and not unevenly, which might be the cause of secondary bleeding into the mouth; when the part is fairly excised apply the hair-lip suture to keep the lips of the wound together; sometimes you will have to remove a piece from the cheek also, but you may make as free with the cheek as with the lip.

FUNGUS HÆMATODES.

AMONG the numerous diseases that have been confounded with cancer is spongoid inflammation or fungus hæmatodes. Indeed, some writers, from their belief in the identity of the two diseases, have called it soft cancer; yet the two differ from each other in many essential particulars. We saw that cancer is most prevalent at the later periods of life, and is

scarcely ever seen before the meridian of life. Now, fungus hæmatodes is, on the contrary, rather more common in youth than age: there is scarcely any age in which an instance of it may not be met with—in infancy, at puberty, or at a very advanced age. I saw a child only three years old who had the disease in its testicle, and who had to undergo the operation for its removal, and I have not unfrequently met it in elderly people: I think between thirty and forty is the most common age to see it. There is much variety in its characters, both as regards its internal structure and those external features by which it is to be recognised by the surgeon, some of which depend on its seat, but others upon no assignable cause. When it attacks the limbs, it begins as a tumour. If it should be just under the skin, if it is not situated under a fascia, it feels very soft and compressible, and you can move it about under the skin, to which it has no attachment: you cannot define its limits by sight or touch, even in its very early stage; it seems confounded with the parts beneath it. If it is under a fascia, or other unyielding structure, however, it is more tense, and sometimes feels very firm, but always differs from an encysted tumour in the sensation it gives the hand of an examiner. Sometimes, from the springy elastic feel of the swelling, it would almost seem to contain nothing but air; at other times it perfectly resembles the feel of fluctuation. In the commencement it gives the patient no pain or uneasiness whatever: he is often even unconscious of its existence for a considerable length of time—in fact, the tumour is frequently the first thing he notices. A common place for it to occur is about the scapula, and in this situation I have known the tumour to attain a large size before the patient was

at all aware of its presence. In its early stage it has nothing remarkable about it, and yet on examining it you are conscious it is not like other tumours, and that all you have to do is to watch its progress. When it begins to give pain, the sensation is as if scalding water was constantly pouring on the part, or as if a hot iron was laid on it. Pains are also felt darting through it, and their severity and frequency of recurrence increase with the advance of the disease. In the beginning, however, they are trifling, and are not increased by exercise or by handling. Unlike cancer, the integuments over a fungus hæmatodes are neither discoloured, irregular, thickened, nor puckered. Indeed, it frequently presents a perfectly sound appearance, even after the tumour has attained a very large size, and all one can particularly remark about it is, that it is on the stretch, and has a number of large flattened veins running through it. As matters go on, the pain becomes more constant and severe; unlike cancer, the diseased mass extends deeper and deeper, as well as enlarges in every other direction, and the free motion of the limb becomes impeded. At a still more advanced stage the tumour frequently becomes irregular on its surface; in some places it will be very hard, as hard as scirrhus, while between these hard portions there will be the exact feel as if it contained a deep-seated fluid, and yet if punctured at one of these spots no fluid may be discharged. Should there be more than one of those soft spots, and that they are but a short distance from each other, you will be conscious that they do not communicate with each other, if you alternately press one or the other with your fingers, as other collections of matter will generally do. After an uncertain period of time has elapsed, the skin over the

tumour at length gives way, and a glairy kind of fluid is discharged : this continues to flow for a very few days, and then a fungus makes its appearance, which bleeds on the slightest touch, or even spontaneously, and sometimes in an alarming quantity. This fungus, which increases from day to day, discharges a watery fluid, extremely foetid, and sometimes mixed with blood. When it bleeds, the blood evidently comes from veins, for it has not the florid appearance of arterial blood. Long, however, before the skin ulcerates and gives way, the patient suffers the most intense pain, and is reduced by it and night sweats, loss of rest and appetite, &c., to a very low state. It is said that the patient dies from loss of blood in this disease, but certainly that is not always the case, for they often die before the skin has ulcerated, and of course before they have lost any blood at all. I think they die of the severity of the pain and hectic fever. There is one very remarkable thing in fungus hæmatodes, and which shows a marked distinction between it and cancer, and that is, that the former sometimes occurs in several parts of the body at the same time—a thing that is never witnessed in cancer. According to my experience, it is true that wherever cancer may be, the lymphatic glands in the neighbourhood become affected, as the axillary and other glands in cancered breast, but then this is an *extension* of the disease ; there is a continuity between them, and not, as in fungus hæmatodes, two parts, at some distance from each other, taking on the disease at the same time. This forms a strong distinction between the two diseases. If we do not examine a specimen of the disease until the patient dies, we are struck with the fact that there is precisely the same appearance of structure in all these tumours—namely, a substance

very much resembling putrid brain or blood; but if we make our investigations into the constitution of the tumour in a limb, suppose after amputation, we find great variety in its apparent structure. Examined in this way in the early stage of the disease, we are unable to perceive any very distinct structure, but a number of striæ running through different parts of it. If the disease had advanced farther, we shall find, on examination, a number of cavities in it containing a yellowish fluid, and these it was that gave the feel of fluctuation during life in some parts of the tumour. When examined after death, if it had been near a bone, the bone will be carious and crumbles in your hand: if you cut into the tumour, it sometimes looks like a piece of coarse sponge saturated with blood, having recesses in various parts of it, and obviously cellular: it has a soft greasy feel, like a soft piece of pudding, with coagulated blood mixed up with it in different parts; when under an aponeurosis it seems as if it was encysted or tied down by the fibrous membrane, and in such a case it will have a hard feel during life, from the very beginning.

There is no part of the body free from the invasion of this formidable disease. It is a very remarkable fact that it may even attack the mucous surface of the urinary bladder. The preparation I now show you is the only instance I ever met of it in this situation. You may see that the posterior and inferior surfaces of the bladder are quite free from disease, but it began at the upper part, and extended down to the urethra: it was the case of a gentleman who came up from the country for advice on account of an occasional discharge of blood from the bladder with his urine. It was proposed to sound him, but it was not done afterwards. What you see here is not one-tenth

of the size of the tumour when recent—in fact, it quite filled the cavity of the bladder, and distended it. When fungus hæmatodes attacks a muscle it quite destroys its fibrous texture, and to a great degree its colour : a muscle so affected cuts like a piece of liver, and has a good deal the look of it. I saw a case where it attacked the humerus, the bone snapped across, and some attempt appeared to have been afterwards attempted by nature to effect a re-union of the fracture, but the patient died before any great progress was made to unite the broken extremities of the bone.

An operation to remove a part affected with fungus hæmatodes, promises at least as little chance of ultimate success, as that for cancer—in fact, they are the most discouraging cases we could meet with for operation, unless it can be performed very early, indeed. You will rarely get your incisions for the removal of this disease to heal, as any other wound would do. For a time, indeed, you would think everything was getting on tolerably well—the part looks clean and healthy, but it soon changes its character. I was present on two occasions where tumours of fungus hæmatodes were removed from the breast, and just this happened, as does in almost all these kind of cases, that part of the wound was healing, and the rest, you would say, doing very well, when a fungus shot out : the disease went on anew, and even with greater rapidity than the original one was doing before the operation.

Before you decide on an operation in one of these cases you must make a very strict examination of the patient, and you will sometimes find at one time several parts of the body affected either externally or in the cavities ; and where you can neither feel nor see

any trace of it, except in the part to which your attention was first drawn, your inquiries as to the state of the patient's functions will give you, so far, an insight into the matter as to make you give up all thoughts of meddling with what you can see, although, under more favourable circumstances, it might be easily removed. There is another occurrence, and one of the most remarkable, connected with its presence, that may apprise you of its existence when you cannot otherwise discover it—namely, the appearance of enlarged veins in the skin over its seat, no matter how deep the disease may be situated. Now, in investigating the possibility of eradicating the entire of the local disease by an operation, and of course the probability of ultimate success, there is one circumstance, connected with these tumours, you should recollect, that, although this affection often attains an immense size, you will always discover that it is much more extensive even than it seems; its limits are not regularly defined, so that it would be quite useless to try to cut out the *tumour* merely, for this disease, like cancer, will attack the cicatrix, and, as in cancer, a secondary operation only hastens the fatal termination of the disease. Besides, it will have so insinuated itself among muscles, and other structures where you dare not follow it, that any attempt to remove but a portion would give rise to a violent hæmorrhage that would throw everything into the greatest confusion in an instant. If every particle of the diseased structure could not be removed, all you would have to do would be to amputate the limb at once; and even although you can do this, and at a good distance from the actual disease, what hopes can you with prudence give the patient's friends that there will not be a relapse? Very little, indeed. If you operate, you

should do so before the tumour begins to be painful. You cannot be too cautious in your promises when about to operate for fungus hæmatodes, for although you remove the limb, and with it all of the disease apparent, you can never tell but some *internal* part is likewise affected with it. The last case I saw of fungus hæmatodes, in Steevens' Hospital, was in the thigh of a woman. She died; and on examining the abdomen, *everything in that cavity was perfectly sound*, but on opening the thorax the lungs were found affected with it extensively; and this was a fair example, showing where the disease existed in two places distinctly at the same time, and where it could not have extended from one to the other. Medicine of any kind is as perfectly useless in fungus hæmatodes as it is in cancer. I remember seeing a young man who had it in his arm, and it appeared to be excited by a slight blow he got in play with his brother: a physician attended him who thought he had made a great discovery—viz., that his patient had had a gonorrhœa a couple of weeks previously to this appearance of the fungus hæmatodes: he accordingly put the young man under a course of mercury, and the result was enough to deter me from ever thinking of giving mercury as a cure for fungus hæmatodes as long as I live.

There are other diseases, which, seeming to have some affinity to cancer and fungus hæmatodes, yet are not, in my opinion, either the one or the other. I do not know what name to give them, but this drawing, however, shows their appearance. [The swelling was in the neck, the whole of which seemed to be engaged; it appeared to have a number of welts or thick wrinkles of a bluish colour traversing the neck round. The whole of the neck was of a bluish colour;

the extent of the disease was pretty accurately demarcated above by the horizontal ramus of the jaw, and below by the clavicle.] In this case the man got a swelling in his neck; a puncture was made in it, and shortly after the patient died as if he was choking. I saw an army surgeon who had the same description of disease, and he died from hæmorrhage that took place two or three times from it. Sometimes the side of the nose swells, as in this drawing. [The side of the nose had a swollen and dark-red appearance, with a number of veins running in different directions.] But I cannot consider either of these as cancer or fungus hæmatodes. The eye is sometimes affected with fungus hæmatodes, the first appearance being seen through the pupil at the bottom of the eye, as a greenish spot with a metallic lustre. This, which is soon discovered to be a morbid growth within the ball of the eye, beginning at the bottom of the cavity, gradually advances forward, until it reaches the cornea and destroys it by its pressure: and no longer having any resistance to its progress, it quickly enlarges to a frightful extent, altering or destroying everything in the orbit—nerves, muscles, and the adipose substance. The eye has been removed by the knife for this disease, but with as little success as operations for fungus hæmatodes generally experience; yet if the disease be recognised very early, the patient ought to get the only chance left him. In the majority of such cases, particularly if it has existed for any time, the brain will be found extensively diseased.

Fungus hæmatodes sometimes attacks the testicle; indeed, as far as my experience goes, it is a much more common disease of that gland than scirrhus, which is not very often met with in it; and when

in this part particularly, there is not a surgeon, no matter how practised he is in the tact of fluctuation, that may not be deceived as to the real nature of what he has come to examine. I would defy any man to say positively, in some instances, whether a case be hydrocele, a collection of matter, or other fluid, or fungus hæmatodes of the testicle, from the mere feel of it. You will now and then meet cases where you will suspect that there is something more than dropsy on a careful investigation, even early in the disease, for the constitution soon sympathises with the one, and not with the other; you will be able, perhaps, to detect some of the lumbar glands enlarged, and you will notice the peculiar unhealthy yellowish colour of the skin; both, however, begin without pain, but, as in all situations where fungus hæmatodes is met, the pain will be excessive at a later period, while there will be no pain in the course of a hydrocele, or any constitutional disturbance, except in some rare cases where the fluid forms very quickly, and presses on an unsound testicle. The fungus hæmatodes of the testicle attains a very large size sometimes, but its shape, when it might be confounded with hydrocele, is not exactly the same shape as it: in the former, it will be a little flattened at the sides, and begins in the body of the organ; the shape of a hydrocele is somewhat pyriform, and begins at the bottom. If you make firm pressure on the fungus hæmatodes, you generally give pain, but unless the testicle is diseased, and perhaps the quantity of fluid small, you do not give pain in pressing a hydrocele. You know that in hydrocele of the tunica vaginalis of the testicle the scrotum undergoes no change of colour, but in fungus hæmatodes of the gland the scrotum will often, even in the early stage,

be of a deep unhealthy red or livid colour, or the redness may be slightly marked, and there will appear the enlarged veins on its surface. If your suspicions are awakened, and that you examine farther, you may find some of the lymphatic glands in the groin enlarged and diseased, or you may be able to feel some of the glands in the abdomen in that condition; or from seeing the extremities œdematous, you may suspect that some of the glands through which the absorbents of the limb pass have become diseased, although not so enlarged as to allow them to be felt externally. When the disease has made sufficient progress, the surface will become tuberculated in the fungus, but it is generally uniform and smooth in hydrocele, except at the upper and back part where you may feel the hard and irregular depression of the testis. You may find in the spermatic cord or elsewhere, an indication of something wrong going forward that will deter you from setting about puncturing for hydrocele; but you may see cases where the diagnosis will only be found by the trocar, when it will, unfortunately, be of little service, if fungus hæmatodes.

In the mouth, also, where the disease is not uncommon, the deception is likewise very complete. A child just shedding its first teeth, for example, or in a child before or after this, one of the incisor teeth is pushed up, and after this another, and in a little time a fungus comes up out of the socket: this gives the most obvious feel of fluctuation, and the surgeon, perhaps, thinks it a little abscess, and is only made aware of the truth on making a puncture in it. Sometimes a swelling makes its appearance at the side of the alveoli, and as the feel of fluctuation is quite perfect, it may be thought to be a collection of

matter in the antrum highmorianum, making its passage out in this way ; but if you examine the case attentively, you must see that so large a collection could not have formed in the antrum without causing an external swelling in the situation of that cavity. Wherever, therefore, there is not an external swelling of the bone, in such a case, be very cautious, for very probably it is a fungus hæmatodes. A dentist, if he sees the child, will say, the fungus comes from a rotten tooth, and perhaps extracts another ; but the fungus in this case is not like one coming from a sore, for in the fungus hæmatodes you will observe *it is covered with cuticle*, which no other fungus here is. Fungus hæmatodes is a worse—a more virulent disease than even cancer, or almost any other disease I know of.

END OF VOLUME I.

