LECTURES

ON THE

PRINCIPLES OF SURGICAL DIAGNOSIS:

ESPECIALLY IN RELATION TO SHOCK AND
VISCERAL LESIONS.*Delivered at the Royal College of Surgeons of England.*

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LECTURE I.—*Concluded.*

To return from this digression. The influence of a recognition of the principles to which I was referring is apparent equally in the diagnosis and treatment of disease: in diagnosis, by the enlarged view which is taken of all the particulars of the individual case, meting out a due value and proportion to each; and by comparison with others, similar in all or some of their features; but most conspicuously so in instances where no precedent for comparison exists, and where an opinion must be formed by the observation of remote analogies, from the history of the case, the hereditary tendencies of the patient, and a variety of incidental circumstances which have only an indirect bearing on the questions at issue. In surgical treatment, still more will simple general principles be found efficient guides in practice. But, whether in diagnosis or treatment, the accomplished surgeon brings to the task an accurate acquaintance with the structure and functions of the human frame, and, as far as our knowledge extends, a clear perception of the various relations of sympathy and vicarious action in different organs; so that he may read aright the pointing of the hands upon the dial, and know with confidence where and how to give assistance. But self-reliance is not the only attainment which familiarity in the treatment of disease brings with it. Trust in Nature's unaided efforts seems a simple lesson to learn; yet, I apprehend, there are few of my elder hearers who will not echo the remark, that it is only as years pass by that this apparently rudimentary knowledge is acquired. The readiness to interfere yields only to the conviction which is gradually forced upon us, that it is safer and wiser in this respect to follow than to lead; more judicious to withhold interference until we see clearly the necessity for action, and then to act promptly and decidedly;—taking, in short, for our guidance, those principles which were so ably enforced and exemplified by yourself, Sir, when you fulfilled the duties of the office I now occupy.

It would serve to abate our exaggerated reliance on our own resources, and to enhance our faith in those of Nature, if we could more familiarise our minds with the true character of the phenomena which we are accustomed to regard and to treat as disease. These phenomena find their expression especially in the nervous and vascular systems; yet how rarely can they be interpreted as other than essentially curative in their nature. The excitement, both local and general, which attends the introduction of a poison into the system, and the train of symptoms which accompanies the eliminative effort, are so many steps in the direction of reparation; and such is likewise the case in severe mechanical injuries to the frame. The ulcer, slough, or abscess, are necessary preliminaries to, or accompaniments of, repair, though often destructive in their excess. And the surgeon who has been conversant with such cases will watch anxiously for the reaction which follows the shock of an injury or operation, and estimate thereby the reparative power of his patient. I shall have frequent opportunity, in the succeeding lectures, of illustrating this remark, and of showing that Nature's resentment of an injury is the measure of her ability and purpose to repair it; that the tranquil, unruffled state of the nervous and vascular systems is often a deceitful calm—the index of feeble power, the precursor of inaction, and the harbinger of death.

The intimate alliance which exists between the vascular and nervous systems, their interdependence and mutual reaction, are the sources of numberless complications, which, whilst they often perplex the scientific practitioner, are unintelligible to him who expects to find in the records of the past an exact rehearsal of the present. This remark applies with peculiar force to the class of injuries which I propose to consider. In many visceral lesions, the nervous and vascular systems are immediately implicated; in all, they are necessarily more or less involved; and the numberless sympathies which result demand both sagacity and patient research to unravel, and to refer them to their several sources. And it is often upon the just interpretation of the phenomena springing from these sympathies, that the correctness of the surgeon's opinions and the fitness of his treatment much depend. But the subject of diagnosis has a

far wider basis than this. The etymology of the word implies breadth and penetration; and these are qualities which are especially required in studying the signs and symptoms by which diseases are distinguished and identified. This single word includes a moiety, and a large moiety, of scientific medicine and surgery. Even with it, much of medical practice is empirical; without it, medicine could have no claim to be classed as a science; and surgery could scarcely be said to have existence, except, as was the case in barbarous ages, as a blind and cruel handicraft, rarely benefiting those it pretended to relieve, but mutilating and sacrificing many at the shrine of its ignorance. Happily, the qualifications for surgical diagnosis are within the reach of all who have the opportunity of study, and bring an earnestness to their work; though it must be admitted that natural endowments are not without their influence in assisting their possessor to a rapid and precise judgment regarding the disease of which he may have to determine the character. Yet, as I just now remarked, I am disposed to regard the discernment, popularly attributed to sagacity or an intuitive perception of that which escapes common notice, as really the fruit of patient study and accurate observation, conducted by a well-balanced and educated intellect, of which the conscientious love of truth is a predominant characteristic. A bold and shrewd conjecture of the charlatan may be occasionally correct, and may dazzle the ignorant; whilst the many failures are kept out of sight, or accounted for by explanations or excuses which impose too readily on the uninitiated, who are singularly incompetent to appreciate the long and tedious process by which the scientific practitioner attains that tact and aptitude in the diagnosis of disease, which expresses itself with the modesty and misgiving often appropriate even in the most experienced—appropriate, because he knows, as others cannot imagine, how many sources of error surround him; how many accidental circumstances may influence a conclusion which, to the superficial inquirer, appears inevitable.

The special education of the senses—the agents in observing—has its import, in common with the calm and dispassionate consideration of the information they convey to the mind. Yet, with all the acquired preliminary knowledge which physiology and pathology supply, with all the penetration in observing, and all the delicate tact and distinguishing refinement of eye and ear, which experience alone can impart, the diagnosis of disease and injury is often rendered obscure and perplexing by some novel circumstance, or by some accidental peculiarity which taxes the sagacity of the surgeon to the utmost. The concurrence of two forms of injury in the same locality, such as a fracture and a dislocation; the distortion or unsymmetrical development of limb consequent on occupation or habit; the modified expression of disease dependent upon temperament or excess,—these are conditions which illustrate my remark, and which meet the surgeon at every turn in his daily practice. Again, deformity, or other consequence resulting from pre-existent disease or injury, often masks a present malady. These cases are so frequently brought under the observation of the hospital surgeon, that scarcely a week passes without examples being offered to his notice. But they are not therefore the less perplexing, especially as patients are often unwilling to admit a relation between circumstances which they cannot themselves appreciate; and thus, sometimes in ignorance, sometimes wilfully, they mislead the surgeon.

In other instances, a misapprehension of the true nature of the case may lead to an incorrect history being given; or, again, the history may be true, but perverted by some preconceived opinion transmitted to the surgeon. In illustration of this source of complexity, I may refer to necrosis of bone; not so much because it may mislead, as to exemplify, in a striking class of cases, the difficulties which are sometimes thrown in the way of diagnosis.

The history of necrosis from acute osteitis is generally intelligible enough; but the recognition of the original inflammation of the bone or periosteum would appear to be less simple, if we may judge by the frequency of its being overlooked, or rather masked, by the attendant symptoms. Exposure to cold and wet is a ripe source of osteitis and periosteitis, and so it is of rheumatism. Both are attended with suffering, more or less localised, and likewise with febrile disturbance. Hence, these cases of recognised necrosis are transmitted to us, sometimes as the sequel of rheumatism, at others as consequent on fever. Whereas, the acute suffering, not infrequently of the severest kind, and the corresponding constitutional or febrile disturbance, are both due to the inflammation of the bone or its investing membrane. Thus—to give one or two typical cases—a young sailor was hurt on the thigh, and this injury was followed by an attack of so-called rheumatic fever, and subsequently an abscess formed. When admitted into the hospital, the shaft of the femur was the subject of necrosis. A lad, after repeated exposure to cold and wet, was attacked with fever; the right knee and shoulder being, at the same time, much swelled and very painful. His medical attendant appears to have at first regarded this attack as rheumatic

fever; but, the symptoms assuming a low type, he afterwards pronounced the fever to be typhus, and treated it accordingly. Ten days before I saw him, an abscess opened over the shoulder, and the upper extremity of the necrosed shaft of the humerus presented itself. I subsequently removed the entire shaft as a single sequestrum. These cases are typical of a large class which come to our hospitals for treatment. The apparent obscurity of their early history is not real to those who are conversant with this disease; yet the examples may serve as illustrative of the difficulty in diagnosis to which I referred.

But there are phases of resemblance, in the early stage especially, of diseases and injuries, which may defy the most discriminating diagnosis. Many such cases I shall have occasion to refer to in the ensuing lectures, such as early shock of the severer kind, without visceral lesion, and fatal injury to some important viscus.

In the later stage of some other complaints, where the history is obscure, it may prove impracticable to determine whether the preponderance of symptoms lean to the interpretation in favour of one or other of two diseases, essentially dissimilar in their nature as well as in their origin and development; such, for example, as tumours of various kinds, not excluding aneurism, and especially within the large visceral cavities. A striking illustration in point, and unique in my experience, occurred in a private case which I saw in company with a member of the Council of this College. The patient was the subject of a large tumour occupying the popliteal space, and bulging its lateral walls. This tumour was tense in some parts, soft in others, the skin being thin in many places, and the surface generally somewhat elastic. A distinct thrill was audible in the swelling, as of an artery pressed upon; but there was no variation in size when the femoral was compressed, no distinct pulsation nor expansive enlargement at each systole of the ventricle. The patient suffered considerably; he was emaciated, and his health was greatly deteriorated. The history of the case unfortunately threw but little light on the probable nature of the disease; and the question presented itself as to whether we had to deal with an aneurism or with the encephaloid form of cancer. The preponderance of evidence seemed to be in favour of the latter; and, with the doubt still resting on our minds, we thought the safest course was to recommend amputation. The patient returned to the country, where this operation was performed, and the limb was subsequently forwarded to me. On the morning of the amputation, the operator remarked that there was no pulsation, although the tumour then fluctuated. The disease proved to be aneurism, extending from the upper part of the popliteal artery down to its division; the sac was partially formed of arterial wall, which appeared to have given way in several places, causing extravasation among the muscles to a limited extent, the greater part of the sac, however, being bounded by a membrane, apparently adventitious, and in some places exceedingly thin. The sac was very large, and contained much soft, dark coagulum.

Negative evidence is often of the utmost importance in surgical diagnosis, where the positive symptoms, from their obscurity and the hidden or inaccessible locality of the disease or injury, evade the search of the surgeon. This is remarkably the case in visceral lesions, especially of the head and abdomen. In fact, the treatment of such cases is often determined by the absence of symptoms which, from many existing features, might have been expected to be present. I shall have the opportunity of exemplifying my meaning by reference to cases of injury of the skull, where the external mechanical lesion is unaccompanied by the usual cerebral symptoms; and, if the time permit, by instances of those obscure affections of the abdominal viscera, in which the cause of obstinate and protracted constipation is a subject of speculation, on which the life of the patient may hang.

Diagnosis is rarely a matter of simple curiosity, but is usually of vital importance to the patient; and especially so where the alternative of operative interference has to be entertained. Even when the question, in the abstract, of the propriety of operating admits of none but a positive solution, there are many subsidiary considerations which press themselves on the attention of the reflecting surgeon, apart from the details of the operation itself. He is bound to weigh these considerations carefully, without, however, allowing them to exercise an undue influence on the main question before him. The conditions which demand or forbid an operation must be determined by the general state of the patient, as well as by circumstances of a purely topical nature.

Among the general considerations are—the constitutional contamination or origin of the disease; the temperament and habits of the patient; the soundness of important organs; the existing condition as regards the effects of shock and loss of blood, and the prospective risks attending these and profuse and protracted suppuration, as consequences of operating. The chief topical considerations are—the reasonable hope held out of removing the disease, or of affording compensating relief; and the amount of mutilation which may be entailed. These appear to me the various circumstances associated with diagnosis, where an oper-

ation is contemplated; and I need not add how much the success of any operation depends on the period selected for its performance, and the previous preparation and subsequent treatment of the patient. There are other adventitious and extraneous circumstances, which must not be overlooked where they present themselves. I refer to atmospheric variations, and epidemic and endemic influences which may happen to prevail. On some of the more important of these points, I shall offer some observations in my next lecture, when discussing the subject of Symptomatology.

But I cannot dismiss this allusion to operative surgery without remarking on the disparagement and commendation to which this branch of our art has been subjected—often unjustly so, as I venture to think—by both its detractors and eulogists, from a misapprehension of the true relation of manipulative skill to surgical science. The claims of surgery to be regarded as a science, and the privileges of its professors, have grown, as the *chirurgia* has assumed its proper position, in subservience to those higher attainments which characterise the educated surgeon. I would not undervalue the clever performance of operations; for such success implies the possession of acquirements which do not meet the eye; and manual dexterity is an essential qualification in him whose business it is not only to decide what should be done, but also to do it. Yet, although the mere facility of execution is, after all, only a question of mechanical dexterity, it is often regarded by the thoughtless with an admiration which is as exaggerated in degree as it is humiliating to the operator. No surgeon worthy of the name would, I apprehend, now covet to be described as “*audax in periculis, animo immiserico*”; yet such characteristics are implied by the language in which operative feats are sometimes described even in the present day. The merit of a well conducted operation consists less in its rapid and skilful performance than in its fitness and the care with which it is planned; the arrangement of each step with anxious forethought, and the anticipation of obstacles and preparations to meet them, demand qualifications which test the resources of the surgeon; and the success of an operation depends at least as much on the possession of these qualifications as on the exercise of manipulative skill. There is this peculiarity in surgery, as compared with other professions in which science and art are combined, that the mind which plans and the hand which executes belong to the same individual. The soldier, the architect, the civil or military engineer, frame plans which others have to carry into effect; yet the credit of the execution is justly theirs, for often the actual agents are ignorant of all but the details in which they are engaged. I think there is sufficient similarity in my illustrations to justify the parallel; and, though I am aware that the mechanical skill exhibited in bricklaying is not very exalted, yet, in some of the higher branches of manual engineering, the ability to execute well is acquired only by long apprenticeship, patient toil, and a competent knowledge of mechanics.

In the few general remarks which I have made respecting the determination of the nature and the site of surgical disease, I must not omit to notice an attribute, without the possession of which the most accomplished pathologist may find himself at fault in the presence of his patient. Precision in diagnosis does not depend so much on the analysis of minute details and on the detection of every trifling symptom, as on sagacity in eliminating all that is unimportant, and ability in selecting and giving due prominence to the salient points of a case. Success in practice probably depends as much on the development of this faculty as on any other single cause. In some individuals of great acquirements, their very store of learning becomes an incumbrance from want of tact in using it. Even pondering over the details of an anxious case long and wearily, often unfits the surgeon for giving a lucid and independent opinion, where his diagnosis would be clear and explicit if he came fresh to the subject. He has approached, so to speak, too close to his patient, and the perspective of the picture, which the symptoms in the aggregate present, is defective. In such instances the value of a second opinion is obvious. Irregular practitioners—charlatans—are well aware of the value of selecting some conspicuous feature in a disease, and of professing to direct their treatment towards its removal. But, generally speaking, either in ignorance or from wilful concealment, the true nature of the disease is veiled, and the patient's attention is, in like manner, diverted from the really efficacious part of the treatment, and fixed upon some so-called specific, which is, at best innocuous; and it is well for him if it be not mischievous; perhaps, fatally so. As in medicine, for example, diseased lungs are thus treated, so, in surgery, are diseased joints; beside numberless other ailments which flesh is heir to.

The peculiar qualifications to which I have alluded, as necessary for prompt and sound diagnosis, are exemplified in other engagements in life; and the failure to fulfil them satisfactorily is dependent on the same mental peculiarities, exaggerated by training. I remember being much struck with an instance of this, narrated in the biography of Laplace. The Emperor Napoleon, when First Consul, was anxious to show his

high esteem for the philosopher, and his appreciation of science, in which he was himself no superficial student, and appointed Laplace to an important post among his ministers; but he soon discovered his mistake. The man of abstract science—the profound mathematician—was found entirely incompetent, not from want of knowledge, but from an excess of accuracy which compelled him to investigate personally every subject which came under his notice, with such minuteness as to arrest the progress of business, and to blind him to the relative importance of various points submitted for his judgment,—defects which ill suited the practical and impatient temper of his imperious master. He was soon suspended; and the commentary of his patron was, that “Laplace, though a mathematician of the highest rank, looked at no question in its true point of view. He was always searching after subtleties; all his ideas were problems, and he carried the spirit of the infinitesimal calculus into the management of business.”

I fear it will be thought that I have been tedious and desultory in these introductory observations, and that I have dealt in trite platitudes which have but little direct relation to the immediate subject of these lectures. It may be so; yet I wished to say these things, and I trust that I have not misapprehended the purpose of the founders of this professorship, nor presumed upon the liberty which my position confers, in supposing that it is neither inconsistent nor irrelevant that I should avail myself of this public opportunity, to give expression to my opinion on questions which I consider to be of vital interest, not only in the cultivation of surgical diagnosis, but in the influence they exercise on the progress of surgery as a science.

In medicine, empiricism has its justification in necessity; but, in surgery, it is without such apology, and degenerates from its original and worthy meaning to that popular and degraded interpretation which modern conventionalism has applied to it. Empirical surgery is a paradox, or, if be not so, it is an imposture. I do not mean to affirm that experiment in surgical practice is never to be justified; but he who undertakes so serious an experiment as an operation, without a reasonable belief that benefit will result to his patient, and without a careful consideration and rational explanation of the grounds of that belief, assumes a responsibility which ignorance and temerity may explain, but cannot excuse.

It is true that the successful cultivation of surgery demands not only careful and patient observation, but independence of thought tempered by cautious reflection. Without this qualification self-reliance becomes rashness, and ceases to be that resource which it should be to the surgeon in diagnosis, as it is his unfailing stay in action. Such, at least, Sir, is the lesson I have been taught; or, to speak more correctly, the model which has been set before me by the great masters of our art, from whom it has been my privilege to learn; and by him in particular whose name I have already mentioned incidentally in this lecture as my own honoured master. Mr. Travers is above any eulogy to which I can give expression; but I may be excused for offering this passing tribute of respect to one for whose memory I retain an affectionate reverence, and whose philosophic mind must leave its lasting impress on our profession.

In an eminent degree did John Hunter strive, by his example, to give a scientific tone to surgery. This was the great object for which he lived; this, the great result of his laborious life. He condescended to every detail; he accumulated his materials, shaped them, and put them together; and thus reared an edifice, which is not only an imperishable memorial of the genius of the builder, but an enduring protest against an impatient thirst for fame, and the use of illegitimate means in the effort to secure it.

SUPPURATION IN THE CORNEA.—M. Hoffmann of Berlin, after cutting away the cornea with a knife dipped in a solution of lunar caustic, and keeping this membrane in aqueous humour at an elevated and equable temperature, found that the stellated cells along the divided parts remained unchanged, but that masses of new round and long cellular forms were scattered throughout the whole of the corneal tissue. In the course of from twelve to twenty-four hours these newly formed cells were observed to change their form and position, and to throw off particles which ran together. A piece of cornea irritated by lunar caustic was then placed in blood, and it was observed that the stellate cells remained unchanged in form, and took no part in the suppuration. M. Hoffmann finally irritated the cornea of a live frog, and injected cinnabar into one of the upper lymph-sacs; within four days, a circle of cinnabar was plainly seen with the naked eye around the inflamed cornea. It was found, on closer examination, that the cinnabar had been taken up by the white corpuscles of the blood, and also by the newly formed cells (pus-cells) in the inflamed corneal tissue, whilst in the stellate cells of the cornea no particles of the pigment could be clearly made out.—*Virchow's Archiv*, xlii. 1868.

ON THE THERAPEUTICAL ACTION OF DIGITALIS.*

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IN connexion with the preceding and subsequent observations, it is desirable to notice an interesting theory that has been advanced to explain the action of digitalis; viz., that it acts primarily on the sympathetic (vaso-motor) system of nerves; that it stimulates the said system, and so causes increase in the contractile power of the capillary vessels. The theory has been well put lately by Legroux (*Du Digitale*, Paris, 1867), and supported by reasoning somewhat as follows.

1. M. Galan has *proved* (Thesis, 1862) that digitalis, administered to frogs, will cause contraction of the capillaries of the web.

2. M. Legroux has *seen* the subcutaneous injection of digitaline (one centigramme) cause long continued contraction of the central artery of a rabbit's ear.

3. In certain conditions wherein the sympathetic is paralysed (partially), digitalis will act as known stimuli to it will. I will consider this point more in detail.

What are the effects of paralysis of a sympathetic branch? If it be complete, as after division of the nerve, there will be dilatation of the capillaries of the part supplied by it, increase of heat, congestion, perhaps effusion, etc. If it be partial—that is, if the nerve be doing duty in a feeble manner, as in patients suffering from fever, from debility after hæmorrhage, or from chronic illness—there will occur similar accidents, though in a less degree; the normal balance of circulation will be interfered with; the heat of the body will be increased; the secretions will be altered; there will be partial congestion, as in the extremities; the vessels will be relaxed; arterial tension will be diminished; and the heart's action will be feeble, rapid, and irregular.

Now these effects may be controlled, and even obviated for a time, by a stimulus applied to the same system. Galvanising the distal end of the divided nerve will re-establish normal circulation; and a powerful emotion may re-establish apparent health for an hour or two in a feeble invalid. Now, taking the condition of the capillaries to indicate the state of the sympathetic—their relaxation to indicate a partially paralysed, and their contraction a tonic state of it—it is to be proved that digitalis has power to induce the latter.

In the first place, says M. Legroux, it will, when given to persons in feeble health, *increase* arterial tension, as proved by sphygmographic trace (*op. cit.* p. 46): therefore it must increase the contractile power of the capillaries, the principal indicators and rulers of the said tension.

In the second place, it will lower the temperature of the person taking it, sometimes even *before* the heart action be slowed (Wunderlich and others, quoted at p. 70): therefore its primary effect is not on the heart, but on the capillaries; and it is to contract them.

In the third place, it will diminish the frequency of the heart-beats, and yet it will, in equal proportion, increase arterial tension (Marey); we conclude, then, that the heart is not weakened, but is slowed secondarily to the contraction of the capillaries. This slowing does not occur till twelve, twenty-four, thirty-six hours after administration of a moderate dose; moreover, it is often preceded by a quickening. This latter fact is to be explained as a consequence of increased effort required to overcome the resistance of the narrowed capillaries to which the heart was not accustomed (*sic*).

In the fourth place, it will relieve local congestion; and of this clinical experience will give us proofs. It has been of service in pneumonia (Lissauer, Thesis, Berlin, 1856); in uterine and pulmonary hæmorrhage; and markedly in hæmorrhoids. This last disorder is a good instance in point, because cure may be produced without notable effect on the heart; and, as this is not generally known, I will insert here a few cases kindly forwarded to me by Mr. Duncalfe, who drew attention to this subject in 1859.

CASE IX. April 1859.—T. W., aged 45, had drank freely, but not lately. He had had piles occasionally for many years, more persistently for the last two. With each motion now he passed a little blood and much mucus. On examination, no external pile was found. The sphincter, when pressed upon firmly, gave the sensation of a hard swelling underneath. On straining, there was protruded a dark bluish pile, which was painful to the touch. The sphincter was firmly contracted, and admitted the finger with some difficulty and with much pain. Two or three painful protrusions were felt within the rectum; and much

* Concluded from page 529 of last volume.