AN ADDRESS ON SURGICAL INSTINCT.

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GENTLEMEN, I hope to be able to interest you for a short time in considering what I will venture to term surgical instinct.

Now what constitutes a surgeon? I would say that the acquirement of surgical knowledge, so far as is evidenced by the possession of a diploma to practise the art and science of surgery, is no true guarantee that the possessor of it understands his work. You may perhaps mould an unlikely mortal into a being who calls himself a surgeon, but his actions belie him; and sooner or later, if he does not discover it himself, his friends or his enemies will discover for him that he has mistaken his vocation.

To begin with, the surgeon must have that inherent love of the work he has to do which will render it not an irksome task, but the pleasure of his life; he must have "a heart at leisure from itself to soothe and sympathise" with those whom he has to treat. With his surgical instinct to guide him, our ideal surgeon will seek to extend his knowledge, and to allow no obstacle to turn him from the pursuit of it through life. "Let men be assured that the fond opinion that they have already acquired enough is a principal reason why they know so little" (Bacon, *Essays*, p. 251); and "if a man has not such a degree of enthusiasm and love of his art as will make him impatient of unreasonable opposition, and of encroachments upon his discoveries and his reputation, he will never become considerable in any branch of natural knowledge" (Dr. W. Hunter, *Medical Commentaries*).

How far surgical instinct is a matter of evolution I cannot say, but it is curious to find an illustration of it among fishes, such as the telescope fish, where the male acts as accoucheur to the female in a most amusing manner by rolling her over and over, and a still more surgical proceeding in the *bufo obstetricans*, one of the toads, where the male severs the gelatinous cord by which the ova are attached to the female. I cannot, however, imagine that man's primitive surgery was ever quite so simple as this, especially when we find among some of the oldest writings extant, which carry us back at least twenty-five centuries, indications of advanced knowledge very little behind what we know now. 460 B.C. we find Hippocrates, while strenuously advocating Nature as the physician of disease, yet in surgery a bold operator. He trephined fearlessly, opened the chest in hydrothorax and empyema, and treated fractures and dislocations by means of wax bandages as we now treat them with plaster of Paris, while in the treatment of infantile clubfoot he practised and advocated a plan of bandaging and fixation such as the most advanced surgeons now chiefly rely upon.

This example will suffice for my purpose, to show that enormous as are the advances which experience has afforded to the present generation, we must not overlook the fact of instinctive surgery, and that the ancients who were the fortunate possessors of it have paved the way for modern advances far more than those who confine their reading to the journals and modern textbooks would be led to believe.

In the ages when mysticism in its varied forms was rampant, although we find glimpses of the knowledge that Nature herself would do all that was necessary, no practitioners were bold enough to hazard their reputation by acting up to this belief, but almost invariably resorted to some application or some mysterious performance to give it due effect. To Hippocrates is due the everlasting credit of having broken through these bonds, which the Asclepiads had so carefully striven to maintain by making the practice of medicine a secret art. In his famous first aphorism is a sentence not often quoted, though to my mind far more significant than the better known "*ars longa, vita brevis*." He says: "The physician must not only be prepared to do what is right himself, but also to make the patient, the attendants, and externals co-operate." Herein he displays his true perception of surgical treatment, the secret of his success. At this time and for centuries after, the surgeons proper were only, as Spence

calls them, "hands for the learned doctors," and thus their sphere of observation, and of power to act independently, must have been very limited. It was, in fact, a mechanical kind of surgery, confined chiefly to cutting for stone, cure of rupture and other specific operations, many of which would probably have been far better left undone. The true surgical instinct seems to have been handed down through the physicians, and by a gradual process the modern surgeon has been evolved, retaining the true hereditary instinct; necessity, experience, and above all a keen knowledge of all his surroundings having done the rest.

There may be some danger, perhaps, that surgeons of the present day may become too mechanical, and that, while the physician looks upon every affection he meets with as one amenable to therapeutic treatment, or, as some would put it, the *vis medicatrix nature* only, the surgeon is apt to go to the opposite extreme. The medical mind is apt to fall into the error which even in the great minds of Abernethy, of Pott, and of Astley Cooper, almost led them astray—that of largely ignoring local disease in the importance of considering constitutional influences.

It is perfectly true, as Sir Astley Cooper has so well pointed out, that the susceptibility of different individuals is a matter of vital moment. At present we have no means of gauging the resisting power of individuals, some of whom seem almost injury-proof, while others succumb almost from being looked at. I remember a striking instance of this in a patient who was to have had an abdominal section performed, but she died suddenly the night before. Nothing was found after death beyond an ordinary ovarian cystoma and a fatty heart. If this had occurred after the operation instead of before, there would have been one more case added to the list of deaths ascribed to surgery, no doubt.

In some instances we meet with the whole system seems imbued, as it were, with a tendency for disease—for example, tubercle—to manifest itself somewhere, as in the metastasis from the chest to the abdomen, or as in a case of a man whose leg I amputated for tubercular synovitis, who went on very well as far as the leg was concerned, but died of acute tubercular meningitis in three weeks after. This is one mode of origin of local disease which is not infrequently ignored; the system is so full of the tendency to it that it must come out somewhere. But may not the converse be equally true? While the one condition is essentially constitutional, probably accumulating through many generations, in the latter case it would be purely local; and, although it might be of a character to become constitutional, several generations may be needed to endue it with an hereditary character. Experience teaches us that it is far safer to trust here to the surgical instinct, which says, "Remove the disease forthwith;" and as the wisdom of our patients increases, so as to lead them to speak of local diseases while in their earliest stages, who knows but, in course of time, their hereditary constitutional character may be stamped out?

The surgeon meets with a case of local mischief; take, for example, epithelioma of the lip. His instinctive knowledge tells him he has something to deal with which may (very improbably) remain as it is, or may, on the other hand, be a focus for the diffusion of changes throughout other parts of the system. How is he to judge of the probabilities of either event happening? In the present state of our knowledge there can be no hesitation as to the course to pursue. We have a state of negative good, which may at any moment lead to one of positive evil; and on this ground the surgeon would eradicate it forthwith, just as he would a weed in his garden, before it has had time to seed and be beyond his control. I am aware that some eminent surgeons and pathologists still maintain the necessity for constitutional tendency before local disease can assume a malignant character; but their precepts, I fear, differ from their practice, and their true surgical instinct will guide them into the safer course I have indicated. I might refer to many instances in support of this principle, but will mention only two or three.

An old lady, 64 years of age, came under my care for a very large typical cystic sarcoma of the breast. She informed me that a small lump, not larger than a nutmeg, had existed for forty years, and that three months before I saw her it began to grow, and had become the enormous mass it was in that short time. I removed the breast, and she made a rapid recovery, and, so far as I am aware, she has remained well since. Her general health was good throughout.

Another instance: a man about 40, who came for an ulcer on the tongue, which I and my colleagues thought specific (as there was a distinct specific history). Under medical treatment the ulcer improved, and he returned home under the impression that it would be cured. Six weeks afterwards he presented himself again, the sore having rapidly increased, and assuming a decided malignant character. I removed the entire tongue; but rapid glandular implication took place, and death occurred shortly after. Of course I ought to have

operated while "in doubt." Then it was the transition from a passive to an active malignant condition probably took place.

The only other case I will refer to is one of a man over 60, an old soldier, whom I saw in consultation for a growth over the ascending ramus of the lower jaw, involving the skin, which was beginning to ulcerate. The jaws were fixed, so that for some time only liquids could be poured behind the teeth. The man was reduced to a skeleton, and was kept alive by morphine and stimulants, suffering excruciating pain. He was seen by some very good surgeons, who considered the disease malignant, and declined to interfere, as the submaxillary gland was also enlarged on the same side. The man's extreme suffering, and his willingness to submit to any measure which might give even a temporary respite, made me resolve to operate. I removed one half of the lower jaw, with a large elliptical piece of skin involved in the growth (which was sarcomatous, growing from the periosteum), and the patient rapidly got well. After the operation the local glands increased greatly in size, and alarmed us considerably; but, in spite of all these adverse conditions, recovery was complete, and he is now, five years after, a hale, active man, in perfect health. The disease here was clearly local, in spite of all its deceptive surroundings.

On the other hand, the surgeon will meet with many cases referred to him which more properly belong to the physician. One of the most common of these is gout or rheumatism, so often the result of an injury, but where general treatment is of course demanded.¹

Some time since I met with a very interesting case, in which the tables were, as it were, turned upon us by that goddess "Nature." A lad whom I saw in consultation was suffering from the usual indications of ordinary leukaemia. He was extremely feeble, pale, puffy, breathless on exertion, with rapid heart action and feeble pulse, and had that well-known waxy look characteristic of the disease. He had been a healthy, country-born lad, and his surroundings were favourable. On examining the blood from his finger, I was struck, not only by the great disproportion of white to red corpuscles, but by their relative increase to the serum of the blood. Under the ordinary treatment he made no progress whatever, took little food, and seemed reduced almost to the last extremity. Then Nature, wiser than we, somehow caused violent epistaxis, and from that time recovery was rapid. I confess that it never entered my mind to adopt such a remedy, and my instinct was clearly at fault. How did it effect the cure? The only explanation I can offer is this: assuming the blood to be too viscid, as it was, for free circulation to take place, nutrition would be *pro tanto* seriously interfered with; the heart would fruitlessly endeavour to overcome the difficulty (giving rise to its own symptoms), and a general suspension of the assimilative functions of the body would occur. The bleeding from the nose released the mechanical impediment by at once getting rid of the surplus of solids in the blood, and the organs were left free to act again.

I am led to think this is the true explanation, because it affords a key also to those otherwise obscure cases we meet with in girls rising into womanhood, which are common enough. The symptoms are similar; the girl keeps too fat, too flabby, pale, and weak, iron does her no good, and her good appetite only seems to add to her trouble. There is in these cases invariably amenorrhœa. As soon as that passes away, the natural flow does for them what the epistaxis did for the boy, and they rapidly get well.

The number of cases which fall into the hands of the surgeon, having a local character, often completely overlooked or undiscovered owing to the manner in which a purely medical mind inspects them, is rather remarkable. Chief among these are uterine or abdominal cases. How often do we meet with cases of menorrhagia which have been under general treatment for weeks or even months, and find an unsuspected malignant disease of the cervix, or perhaps a small polypus uteri.

I saw some time ago a lady who had been the subject of almost constant hæmorrhage, ascribed to "change of life," but which at length alarmed her and her friends. On examining her I found nothing more or less than a small highly vascular urethral caruncle, which was removed, and her troubles ceased. No surgeon would have allowed a case of that sort to remain undetected. I could mention scores of these cases where the reliance on simple therapeutic or homœopathic treatment (so called) almost led to the death of patients in whom a timely surgical examination and local treatment would have put the matter right without risk and at once. In the opposite condition, amenorrhœa, I am afraid even worse blunders of omission as well as commission occur. Quite recently a patient came under

my care with an enlarged abdomen, who was sent for operation as a case of ovarian tumour. The whole surface of the abdomen was studded with pustules, which were, I found, caused by hypodermic injections which had been employed by a man with a medical turn of mind for many weeks, whether to disperse the tumour or no I cannot say. She was pregnant simply. One instance I met with of a woman who had been diligently treated with emmenagogues, etc., in whom I failed to discover any uterus at all. She never had menstruated, and never would. Other frequent causes of either of these conditions, and almost always accompanied with dysmenorrhœa, are flexions of the uterus. The medical mind prescribes tonics, perhaps change of air and scene (often the very worst things), and trusts entirely to general treatment of symptoms to effect a cure. But how often does this succeed? The patient, after wearying of this unsatisfactory state, comes to the surgeon, who simply applies his instinctive surgical knowledge to this, as he would to any other part of the body, and finding a mechanical cause, treats it mechanically, when the subordinate symptoms speedily disappear. I have a strong suspicion that many practitioners who meet with cases of this kind act from a sort of kindly wisdom, that it is safest not to meddle with what they do not understand, and leave Nature to do for them what they are themselves unable. But is this fair to the fair patient?

Another class of cases are not uncommonly referred to surgeons to deal with as a *dernier ressort*—abdominal obstructions of various kinds. In the course of my practice I have seen a large number of these, some of strangulated hernia treated for several days, in one case by three medical heads without any suggestion of an operation until when I was asked to see the patient he was moribund; some of hydrocele, one of whom has lately seen me having worn a truss for sixteen years, which has at last caused a hæmatocele. These are commonly the product of that wiseacre the surgical instrument chemist, who always thinks if he does know one thing better than another it is a rupture. I look upon the truss in the hands of chemists as a most dangerous weapon; the results of their ill-judged applications are often most disastrous. Not long ago I operated on a patient of my friend Dr. Orton, in whom a truss had actually been applied by a London chemist on an already strangulated hernia, which almost cost the patient his life.

Similarly with intestinal obstructions. The surgeon only sees them, too often, when the friends of the patient find death imminent under tentative treatment. I saw quite recently a lady at a distance whom I was sent for to operate upon. There was a distinct obstruction in the right iliac fossa, as plainly indicated as anything could be, with a history of old local peritonitis, probably a band. She had been well dosed with purgatives until sickness was incessant—*enemata*, etc., likewise. When I saw her she was moribund and almost pulseless, and I declined to operate. The medical man in charge of the case seemed to have no idea of the real state of affairs; to his purely medical mind it was inflammation, and he told me with the blindest simplicity "it was nothing more." In another instance a more fortunate result occurred; that of an elderly man who had been under treatment for absolute constipation for nearly three weeks. Obstruction was complete, vomiting incessant, and when I saw him he was reduced almost to the last extremity. He had been under treatment by two medical men the whole time on the usual expectant plan, rational enough from a medical point of view, only it did no good. Another surgeon was called in who asked me to see him; and finding from the history indications of obstruction on the left side of the colon, ill as he was we decided to operate. Colotomy was performed, and an enormous quantity of undigested potato-skins came rushing out, very much to our amazement. On inquiry we found that the last meal he had more than three weeks before had been some potatoes whole, of which he ate freely. Hence the result, and the wisdom of treating the case surgically. He is now quite well.

In no department has the surgical instinct been shown more conspicuously than in what is usually termed abdominal surgery. This has undergone a complete revolution during the last twenty-five years. The subject is now too familiar to need many words, but it is only due to our distinguished member, Mr. Lawson Tait, to say that it is mainly to his energetic and powerful advocacy that the reformation is due. Sir Spencer Wells made ovariectomy a justifiable and successful operation, Marion Sims gave the impetus to other pelvic surgery, but to Lawson Tait the credit is certainly due of having inaugurated a wider scope, which brings almost all abdominal, certainly almost all pelvic, diseases within the range of not only justifiable but eminently successful operative surgery. When I was obstetric assistant at Middlesex Hospital in 1862, two very illustrative cases came under my care, which indicate the state of feeling in the profession at that time, and which I will briefly relate. A married woman, aged 28, had five children

¹ Similarly we meet with instances of osteomyelitis treated as rheumatism, and I believe not infrequently the rash of septicæmia is mistaken for scarlet fever. They may nevertheless be looked upon as first cousins.

naturally. The midwife who attended her in her sixth labour, finding her after delivery still measuring forty-five inches, sent for me, supposing there was another child. I saw her with Dr. Priestley, and we found she had a large ovarian tumour. At the end of three weeks she was about again, her size undiminished. The poor woman died suddenly two months afterwards, from rupture of the cyst and peritonitis, as I found *post mortem*. During the whole time such a thing as an operation was never discussed, so far as I remember; and she died, as so many used to do and even now do, from rupture of the cyst.

The other case was one in which ovariectomy was performed by Mr. Mitchell Henry, with Sir Spencer Wells at his elbow—the first ever performed in Middlesex Hospital. The case was one which we now should consider a simple one, with rather extensive adhesions. All went well until at night, as I was watching the patient, every indication of internal hemorrhage came on. I sent to the surgeon to know what to do, and to ask if he would reopen the abdomen. The reply was that nothing could be done beyond giving brandy, etc., *secundum artem* A.D. 1862. The young woman died in a few hours, and we found, *post mortem*, one bleeding vessel in the omentum and a quantity of blood in the abdominal cavity. I venture to say that, under the influence of Tait's teaching, such an event now would amount to surgical treachery. I can recall, also, the instance of a young woman whom I saw soon after this period, blanched, with a history of suppressed menses, and evident internal hemorrhage. I will quote the words of the standard textbook at that time, referring to such cases of what I assumed to be rupture of the Fallopian tube: "This accident is almost always fatal. If there be time for remedies, of course the most active antiphlogistic treatment is the most appropriate; such, in fact, as would be prescribed for peritonitis under ordinary circumstances" (Churchill, *Dis. Wom.*, 1864, p. 494). I trusted to this teaching, and, as a consequence, my young patient died before night. Now that the ordinary rules of surgery are applied to the interior of the abdomen as to the exterior, such a lamentable result cannot occur without culpable negligence somewhere. In those days we knew no better.

So with regard to other affections of the female pelvic organs, it is quite clear that many of these, which have formerly been in the hands of the physician, will become proper subjects for the surgeon. A new light has dawned on many obscure conditions which have been too often guessed at, frequently mistaken, and perhaps in many instances entirely overlooked. The unhappy patient suffering from chronic ovaritis, from pyosalpinx, or some allied disease, is often the victim of everlasting medical treatment, sometimes a little better, much more often worse, until the cause of her trouble is removed; and our united experience as a Society I am sure fully confirms Mr. Tait's decided statement that nothing short of the removal of the offending parts will be permanently effectual. Indeed, he has made this no longer a question of doubt, but an established rule of surgery. For my part, I fail to appreciate the sickly sentimentality of those who raise objections to all such operations for removal of ovaries, whether diseased or not, on the ground of unsexing a woman, because I think the reasoning is founded on a false assumption. Has anybody shown one of the converted masculine women as a complainant on her own behalf? I never heard of one and never expect to see one.

Now to turn for a moment to some of those cases in which we are so greatly indebted to physicians and physiologists, such as cerebral tumours. Although the brain has been dissected and known for three thousand years or more, it is only within a recent period, since the localisation of the functions of the brain has been carefully ascertained by physiological investigations after pathological observations failed, that a sufficiently precise knowledge has been obtained to justify any specific surgical operation for their removal. We now know from experience that the interior of the brain may be surgically dealt with like other interior parts of the body, provided proper skill and precautions be exercised.

My friend and colleague, Mr. John Alcock, some time ago had a case in which he removed a depressed portion of the skull which had been the cause of epileptic attacks continuing many years, and did so with complete success. There is every reason to hope that in this happy union of physiological knowledge and practical surgery many lives will in future be saved from some of the most distressing ills which torment the human body.

Since I read a paper at Cork in 1879, by which I acquired a rather unenviable title, the smouldering fire of attempts to cure hernia under modern systems has been fanned into a flame, as will be readily seen by the mass of literature which has since appeared on that subject, and I am disposed to hope that the old misdirected surgical instinct (like that which does not prevent swallows flying against objects in their way) has been so far modified by recent knowledge and expe-

rience that operation for this affection has now become what it never was formerly, not only a justifiable proceeding, but one which the State has a right to look for in the interest of future generations. But I have already had a good deal to say on this matter elsewhere, and will now only add that the evidence of the last few years is largely in favour of some operative procedure, and that deaths from strangulated hernia ought in time to be almost unknown.

Let us now proceed to consider how the surgeon is to "make the patient, the attendants, and externals co-operate." With regard to the first point, the great thing is to keep our patient in a good humour, especially if any operation has to be done, not mentally only but physically. His stomach, his kidneys, and other working gear must be put into as favourable a condition as the circumstances will permit, as everybody knows.

The second object is an important one. However much may depend on the skill of the surgeon, his efforts may be entirely frustrated by an officious nurse or an ignorant but willing friend. Let him take care, therefore, to ascertain for himself that the attendant is one on whom he can safely rely. Trained nurses are very much like trained medical men, some are excellently practical, while others are uselessly aesthetical. Many of the best surgical nurses are ill-fitted for a tedious medical case, and *vice versa*. It is a great advantage to have a nurse well acquainted with one's foibles, who knows by a sort of surgical instinct what to do and when to do it, and does not irritate the operator by fussiness on the one hand or a listless inertness on the other. There are plenty such, and a great comfort it is to have them.

How much depends on the "externals!" The experience of recent years has caused an entire change in the ideas which formerly prevailed with regard to a patient's surroundings. In ancient as in modern times the most salubrious sites were chosen for hospitals, and yet the internal sanitary arrangements were such as to bring about the very evils they were intended to overcome. I will not weary you by reiterating the defects of old buildings intended for the sick; they are now well known; but I would refer to the necessity which still exists for the surgeon to ascertain for himself the sanitary condition of any house or institution in which his surgical patient is placed, possibly operated upon.

His surgical instinct will help him here, very much as it helps a ferret under certain circumstances. He will not think it beneath his dignity to see for himself that the drainage is right; that there are no direct communications between soil-pipes and lavatories and such like within the house; that no middens or other such objectionable accumulations lie under his patient's window; that the ventilation of the room is good, without draught; that, if needful, the room is fumigated, whitewashed, and so on, before his patient enters it; and that no contagious illness has previously existed in the place. The slightest hint of erysipelas, of blood-poisoning, tetanus, or obscure conditions euphemistically termed "low fever," ought to put the observer on his guard at once. I am quite sure sufficient attention—personal attention—is not paid to this important subject; and I am equally sure that those surgeons who can boast of the most successful work make it a *sine qua non* to satisfy themselves on this vital question. That we all need this reminder is evidenced by circumstances within my knowledge, where a first-rate surgeon actually performed a capital operation in a room which was appropriated primarily and principally to a water-closet and a lavatory basin, from which the waste-pipe ran directly on to a not over clean grid immediately below!

And a painful case occurred to myself some time ago, which also indicates the need for circumspection. I was called upon to amputate the breast of the wife of a farmer whose house I had never visited. I made sure of a good nurse, and a reliable assistant, who thoroughly understood Lister's antiseptic spray treatment, with which we went fully equipped. On approaching the house, which was a large and good one, to my horror and consternation a certain well-known malodorous exhalation led me to exclaim, "Surely this must be a sewage farm!" and, having ascertained this to be the fact, I hesitated about operating with such precious "externals;" but a blind faith then in Listerism made me bold; with every minute detail most implicitly and specially observed, my unfortunate patient the next day gave evidences of my temerity in a high temperature, an oily serous exudation from the wound, and, in short, every indication of septicæmic mischief, which culminated in acute septic pneumonia, and a tedious convalescence. That this was attributable to the state of the atmosphere surrounding my patient I have no doubt whatever.

It taught me two lessons: one never to operate if possible without knowing the sanitary state of the residence, and the other to shake my faith in Listerism. I am almost afraid to enter on this question, but must say a few words about it. How did the foul atmosphere affect

my patient? According to Listerian doctrines, such an effect was impossible. But it occurred, nevertheless, and to my mind it affords a clue to some important considerations in connection with this subject. We all know that Lister's theory is based on the principle that to produce morbid results after an operation or a breach of surface germs of some kind must find an entrance; and the object of his practice is to keep out if possible, or to render inert, any such morbid bodies. But I have long thought, and am now very much inclined to agree with Sir Henry Roscoe (Address, Brit. Assoc., Manchester, 1887) when he says: "Present research points to the conclusion that the microscopist must give way to the chemist, and that it is by chemical rather than by biological investigations that the causes of diseases will be discovered and the power of removing them obtained." I do not think sufficient regard has been had to the influence of ptomaines, which must be far greater than that of mere germs, and which have been proved capable of producing their specific poisonous effects "in entire absence of living organisms." Take, for example, yeast, in itself inert, and so far as I know quite harmless in a wound; but place it in some saccharine solution, and you get an active poison (alcohol) speedily developed. Are there not analogous conditions of the blood or fluids of our own body in which, when a certain germ is introduced, poisonous ptomaines are developed which exert an influence which the germ itself was quite powerless to effect? Given a certain condition of the body, whether due to influences from within or surroundings without, and the introduction of a certain kind of germ immediately leads to such changes in the state of the pabulum as to create a poisonous product. Take, for example, a case of osteomyelitis. We often wonder why, in a case of this kind, in which there has been no contact with outer air or any outside germs, we should have pyæmia, perhaps septicæmia, set up. Now, we know how subtle must be some of the agents which affect us in this world. Even Dr. Dallinger has not yet discovered the size or shape of an atom of scent. But let a minute portion of some substance be inhaled only, and you will find evidences of their having passed into the organism. If we assume, therefore, that a quiet process of living death is going on in the bone marrow, so long as it is permitted to go on quietly no harm results; we know this often goes on for months, or perhaps years, unsuspected even; but so soon as certain products to which the body may be exposed find access to the part through the blood, then I imagine that change takes place which enables the micrococcus to set up its poisonous fermentative action, and the result is soon manifested in the development of the ordinary symptoms of septicæmia. It is not necessary for the bacilli or other organisms to find their way in; they are probably there already; but only for that special poison in the presence of which they can do evil to find access to them. Therefore, it is quite as important to see that the conditions under which organic germs can work are absent as to trouble quite so much about the organisms themselves. Antiseptics will do much, but common sense will do more to effect this in dealing with wounds. The latter being a not over-abundant commodity, it is as well perhaps for the majority of us to use antiseptics in our work, notwithstanding what may be argued in favour of their abolition. The perfect surgeon has not been evolved yet, and until he is I certainly advocate the use of those antiseptics which are best adapted for individual cases.

At this point, whenever anything surgical has to be done, surgical instinct will show itself in strict attention to minute details. A careful preliminary examination is made—under an anæsthetic, if necessary; nothing is taken for granted, and the course of proceeding determined upon. The surgeon must have brains in the tips of his fingers as well as in his organs of sense, give definite instructions to his nurses and his assistants beforehand, so that his sponges may be properly prepared, silk ligatures previously boiled, instruments faultlessly clean and methodically arranged; the patient's surroundings in accordance with directions given as to bed, temperature, light, and accessories. No detail ought to be too trivial to have his attention; it is the completeness of his preliminaries which goes far to ensure success. In the case of hospital nurses it is useful to have definite rules drawn up, so that each one may know her duty, more especially in abdominal surgery, when everything should go on like clockwork, and as silently.

In the method of dressing wounds I believe we shall revert to the simplest, of which none is better than scorched lint. Some of the best results in my practice have followed its use. Gamgee tissue is extremely useful for almost all purposes, though more comfortable often when reversed. Much is said about drainage, and a recent writer (Professor Turazza, *Lancet*, vol. i, 1887, p. 947) endeavours to show that it is altogether a mistake. It may be so in his country, but I think not here. Drainage-tubes need discrimination in their use, far beyond the pedantic daily shortening of some surgeons. The

sooner the tube is removed the better—at any rate in private practice; and I usually take it out at the end of twenty-four or thirty-six hours after it has served its purpose of draining away the first effusion. Chassaignac has immortalised himself by its invention, though it was devised originally for sinuses and such like. There is a small point regarding silver sutures I may mention, which is very useful; and that is, as soon as tension occurs, to nick them through. They maintain a sufficient hold, and need not be removed until union is firm. Many wounds are torn open in removing them too soon, because they cut, as they will sometimes in the best-regulated surgical clinics. Then, again, in the after-treatment of his cases, there is a tendency now for our surgeon to revert to the practice of many years ago. The simplest possible diet takes the place of repletion and bleeding, the use of purgatives after abdominal operations superseding opium and aromatics. On this point Abernethy wrote (*On the Constitutional Origin of Diseases*, p. 13): "In many instances opium will not prevent continual efforts to vomit; yet when, by sulphate of magnesia, etc., stools are procured, vomiting ceases, the stomach retains both food and medicine, and general tranquillity of constitution is as suddenly restored." This accords with the most recent opinions on the subject of abdominal operations by Lawson Tait and others, and the view is commonly expressed that those patients who vomit freely after an abdominal section make more rapid and more certain recoveries. The most striking results obtained by the modern surgeon are the rapid healing of wounds and the larger proportion who recover. It is usually safe, for example, to promise a patient whose breast has been removed in private practice that she shall be quite well in a week, and I have here some extracts taken at random from my notes of such cases which show that four or five days often suffice for such wounds entirely to heal.

Extract from Notes of Breast Cases in Private Practice.—1. Miss B., aged 40, had fibroma of breast removed, with large part of mammary gland, November 17th, 1885. Whale-tendon ligatures, wire sutures, and sublimate gauze dressings and drainage-tube. 18th. Removed tube. 21st (4th day). Took out all sutures; wound perfectly united, without a drop of pus. Quite well.—2. Mrs. M. C., aged 41, on October 16th, 1883, had large fibrocystic tumour of breast removed, weighing a pound, and involving a long incision. Catgut ligatures, silk-worm-gut sutures, eucalyptus gauze dressings and drainage-tube. 18th. Tube removed. 21st (fifth day). All sutures removed. Quite well; no further dressings.—3. Mrs. M., aged 42; removed entire breast for scirrhus, September 26th, 1887. Wire sutures, catgut ligatures, alembroth gauze dressings. Tube removed next day. On October 1st (five days) perfectly well; all sutures removed. No further dressing.

Among such cases I have no death to record in private practice, and I find there have now been forty consecutive breast amputations at the North Staffordshire Infirmary without a death.

In looking over notes of operations in the old days of unhealthy hospitals, one is struck by two significant facts; the patient's record is either a very long or a very short one; or, in other words, a large number quickly succumbed to the evil influences around them, while those who did recover had a long and oftentimes hard struggle for life. To show what a change has taken place, I have collected some statistics of our own North Staffordshire Infirmary, and some which have been published as typical by Sir J. Lister.

Sir Joseph Lister has given the statistics of deaths from larger amputations in the Glasgow Royal Infirmary, before and after the introduction of his antiseptic treatment. Here are the figures: For the two years, 1864 and 1866 (old style), total amputations, 35; deaths, 16; mortality rate, 47.70 per cent. For the years 1867, 1868 and 1869 (Listerian), 40 amputations; deaths, 6; mortality rate, 15.00 per cent. And in 1879 the same surgeon published the results of 80 amputations performed at the Edinburgh Royal Infirmary, under his own method, of which 16 only were for injury, the other 64 for disease; 80 amputations: deaths, 9; mortality rate, 11.2 per cent.

I think, however, the figures I am about to give from the records of the North Staffordshire Infirmary will convince you that other modes of treatment are even better. The old infirmary at Hanley was a much patched up building, containing about 130 beds, with nearly all the defects of insufficient cubic space and sanitary arrangements of such institutions built seventy years ago. The only redeeming feature was its open situation. In 1869, this building was abandoned on the opening of the new infirmary at Hartshill, built to hold about 190 patients; and the addition of detached wards for children and for ovarian cases has increased the number of beds to 212, of which a large proportion are usually filled. The Listerian period began in 1871, and was continued with more or less strictness up to 1881. It was then gradually relinquished, and for the last four or five years has been used only

in such operations as osteotomy and some excisions. Now, so far as the spray is concerned, it is not employed at all, or only as an offensive instead of a defensive weapon. I have been obliged to take for our purpose the figures given in those years which contain the best kept records—some are defective—but they are taken irregularly for no other reason. They represent, I think, fairly the periods for which they are given.

Major Operations Performed at the North Staffordshire Infirmary During Five Years.

Operation.	1854		1855		1856		1857		1858	
	No. of Cases.	Died.	No. of Cases.	Died.	No. of Cases.	Died.	No. of Cases.	Died.	No. of Cases.	Died.
Amputation Hip Joint ..	—	—	—	—	—	—	—	—	—	—
" Thigh ..	5	1	2	—	4	1	1	—	6	2
" Leg, or both ..	4	—	9	1	5	—	1	—	—	—
" Ankle Joint ..	—	—	—	—	—	2	—	—	2	—
" Shoulder Joint ..	—	—	1	—	—	—	—	—	1	—
" Arm ..	4	1	3	1	6	—	3	1	1	—
" Forearm ..	—	—	—	—	—	—	—	—	1	—
Excision Hip Joint (Disease) ..	—	—	—	—	—	—	—	—	—	—
" Knee (Disease) ..	—	—	—	—	1	—	—	—	—	—
" Elbow ..	—	—	—	—	—	—	—	—	2	—
" Breast ..	3	—	1	—	4	—	2	—	—	—
" Testis ..	1	—	—	—	—	—	—	—	1	—
Lithotomy ..	—	—	—	—	4	1	3	—	3	1
Amputation Penis ..	—	—	—	—	1	—	—	—	—	—
Total ..	17	2	17	2	25	4	10	1	26	5

Total for 5 years :—Cases, 95 ; Deaths, 14 = 14.73 per cent.

Major Operations Performed at the North Staffordshire Infirmary During Five Years.

Operation.	1859		1860		1861		1862		1863	
	No. of Cases.	Died.	No. of Cases.	Died.	No. of Cases.	Died.	No. of Cases.	Died.	No. of Cases.	Died.
Amputation Hip Joint ..	—	—	—	—	—	—	—	—	—	—
" Thigh ..	1	—	—	—	2	1	5	3	2	—
" Leg ..	10	3	5	1	6	1	12	4	10	2
" Ankle Joint ..	1	—	1	—	1	—	—	—	—	—
" Shoulder Joint ..	—	—	1	—	—	—	—	—	—	—
" Arm ..	1	—	2	1	3	—	2	2	1	—
" Forearm ..	3	—	4	—	3	—	2	1	2	—
Excision Hip Joint (Disease) ..	—	—	1	—	—	—	—	—	—	—
" Knee (Disease) ..	1	—	2	—	3	—	—	—	1	—
" Elbow (Mixed) ..	—	—	1	—	—	—	2	—	—	—
" Lower Maxilla ..	—	—	—	—	—	—	—	—	—	—
" Shoulder Joint ..	—	—	—	—	—	—	—	—	—	—
" Ankle Joint ..	—	—	—	—	—	—	—	—	—	—
" Wrist ..	—	—	—	—	—	—	—	—	—	—
" Breast ..	—	—	3	—	1	—	1	—	1	—
" Testis ..	—	—	—	—	1	—	—	—	1	—
Lithotomy ..	4	1	2	—	2	—	2	—	6	—
Amputation Penis ..	—	—	—	—	—	—	—	—	—	—
" Tongue ..	—	—	—	—	—	—	—	—	—	—
Radical Cure Hernia ..	1	—	—	—	—	—	1	—	2	—
Osteotomy ..	—	—	—	—	—	—	—	—	—	—
Total ..	22	4	22	2	22	2	27	10	26	2

Total for 5 Years :—Cases, 119 ; Deaths, 20 = 16.80 per cent.

¹ A—Burns. B—Comp. Fract. Tib. and Fib. and Femur. Comp. Com. Fract. Femur. D—

² A—Comp. Fract. Leg. C—E—Comp. Comp. Fract. Tib. and Fibula sinist., and Fract. Femur. G—Comp. Fract. Tib. and Fib. B—Comp. Fract. Leg. D—Pneumonia after Operation. F—Pyæmia. H—Fract. Tib. Comp. Fract. Tib. and Fib. I—Gangrene. J—Comp. Comp. Fract. Tib. et Fib. K—Fract. Clavicle. Comp. Comp. Fract. Tib. et Fib.

³ A—Comp. Commin. Fract. of Hand. B—Comp. Fract. Ulna and Rad., Fract. Femur, Injury to Spine, Paralysis. C—Comp. Fract. Humerus.

⁴ A—Cancer of Hand.

Major Operations Performed at the North Staffordshire Infirmary During Five Years.

Operation.	1870		1871		1872		1873		1874	
	No. of Cases.	Died.	No. of Cases.	Died.	No. of Cases.	Died.	No. of Cases.	Died.	No. of Cases.	Died.
Amputation Hip Joint ..	—	—	—	—	—	—	1	—	—	—
" Thigh ¹ ..	4	3	3	—	5	3	4	—	2	—
" Leg ² ..	10	3	8	1	9	1	8	1	4	—
" Ankle Joint ..	—	—	—	—	—	—	—	—	—	—
" Shoulder Joint ..	—	—	—	—	—	—	2	1	—	—
" Arm ³ ..	5	2	5	1	2	—	2	—	3	—
" Forearm ..	1	—	1	—	—	—	—	—	6	—
Excision Hip Joint (Disease) ..	1	—	—	—	—	—	1	—	1	—
" Knee (Disease) ..	—	—	—	—	—	—	3	—	—	—
" Elbow ..	3	—	—	—	—	—	1	—	—	—
" Lower Maxilla ..	—	—	—	—	—	—	—	—	—	—
" Shoulder Joint ..	1	—	2	—	—	—	1	—	—	—
" Ankle Joint ..	—	—	—	—	1	—	—	—	—	—
" Wrist ..	—	—	—	—	—	—	—	—	—	—
" Breast ..	2	—	4	—	3	—	—	—	4	—
" Testis ⁴ ..	1	1	3	—	—	—	1	—	—	—
Lithotomy ..	3	—	3	—	1	—	—	—	1	—
Amputation Penis ..	—	—	—	—	—	—	—	—	—	—
" Tongue ..	—	—	—	—	—	—	—	—	—	—
Radical Cure of Hernia ..	2	—	—	—	—	—	—	—	—	—
Osteotomy ..	—	—	—	—	—	—	—	—	—	—
Total ..	33	9	29	2	21	4	30	2	23	7

Total for 5 years :—Cases, 136 ; Deaths, 24 = 17.65 per cent.

¹ A—Burns. B—Comp. Fract. both Legs. Amputation Left Knee Joint and Right Thigh. C—Ununited Fracture. Tetanus.

² A—First, Syme's Amputation, afterwards Amputation of Leg in consequence of sloughing, Strumous. B—Comp. Commin. Fract. C—Comp. Fract. of Leg. Lacerated Wound of Groin. D—Ulcer of Leg. E—Left Leg Blown Off, Fract. of Right Foot, Fract. of Skull.

³ A—Comp. Fract. of Right Arm, Commin. Fract. Right Leg, Laceration of Scrotum. B—Tetanus.

⁴ A—Malignant Disease.

Major Operations Performed at the North Staffordshire Infirmary during Three Years.

Operation.	1879.		1880.		1881.	
	No. of Cases.	Died.	No. of Cases.	Died.	No. of Cases.	Died.
Amputation Hip Joint ¹ ..	1	1	—	—	1	1
" Thigh ² ..	11	1	21	—	10	1
" Leg, or both ³ ..	11	1	8	—	10	1
" Ankle Joint ..	—	—	—	—	2	—
" Shoulder Joint ⁴ ..	—	—	1	1	1	—
" Arm ..	5	—	1	—	4	—
" Forearm ⁵ ..	2	—	3	1	5	—
Excision Hip Joint (Disease) ⁶ ..	3	—	7	3	1	—
" Knee (Disease) ..	—	—	2	—	—	—
" Elbow (Mixed) ..	5	—	4	—	2	—
" Up. or Low. Maxilla ..	1	—	—	—	2	—
" Shoulder Joint ..	—	—	2	—	—	—
" Ankle Joint ..	—	—	—	—	1	—
" Wrist ..	—	—	—	—	1	—
" Breast ⁷ ..	5	1	16	—	13	—
" Testis ..	2	—	5	—	8	—
Lithotomy ⁸ ..	8	—	8	2	19	1
Amputation Penis ..	1	—	2	—	1	—
" Tongue ..	2	—	—	—	1	—
Radical Cure Hernia ..	16	—	6	—	5	—
Osteotomy ⁹ ..	7	—	11	—	4	1
Total ..	80	4	97	7	86	5

Total for 3 years :—Cases, 263 ; Deaths, 16 = 6.03 per cent.

¹ A—Shock, 17 hours. Enormous Sarcoma of Thigh, woman recently confined B—Shock, 12 hours. Compound Fracture, Railway Accident.

² A—Tubercular Meningitis a fortnight after. Wound nearly well. B—

³ A—Crush. Died in a few hours from shock. B—Shock and previous exposure. Lived only a few hours after accident.

⁴ Bronchitis, with secondary Cancer in Lungs.

⁵ Extensive Burns of Body, Crush, etc. Died in a few hours.

⁶ A and B—Erysipelas. C—Embolism.

⁷ Erysipelas following Abortion.

⁸ Peritonitis, all in Adults.

⁹ Septicæmia. Patient very unmanageable.

Major Operations performed at the North Staffordshire Infirmary, during Three Years.

Operation.	1885.		1886.		1887.	
	No. of Cases.	Died.	No. of Cases.	Died.	No. of Cases.	Died.
Amputation Hip Joint ..	—	—	—	—	—	—
" Thigh ¹ ..	6	1	3	—	9	2
" Leg or both ..	5	—	6	—	5	—
" Ankle Joint ..	1	—	1	—	3	—
" Shoulder Joint ..	1	—	1	—	1	—
" Arm ..	2	—	3	—	4	—
" Forearm ..	2	—	1	—	3	—
Excision Hip Joint (Disease) ..	2	—	1	—	2	—
" Knee (Disease) ..	6	—	2	—	1	—
" Elbow ..	—	—	—	—	—	—
" Up. or Low. Maxilla ..	2	—	—	—	1	—
" Shoulder Joint ..	1	—	—	—	—	—
" Ankle Joint ..	—	—	—	—	—	—
" Wrist ..	—	—	—	—	—	—
" Breast ..	9	—	6	—	13	—
" Testis ..	2	—	4	—	1	—
Lithotomy ..	5	—	3	—	3	—
Amputation Penis ..	—	—	—	—	—	—
" Tongue ..	1	—	—	—	3	—
Radical Cure of Hernia ² ..	2	—	8	1	7	—
Osteotomy ..	8	—	8	—	3	—
Total ..	55	1	47	1	59	2

Total for 3 years :—Cases, 161 ; Deaths, 4=2.42 per cent.

¹ A—Septicæmia present before operation. C—Other Leg also amputated for smash. B—For Gangrene with Septicæmia due to compound fracture week before admission.

² A—peritonitis.

Summary of Major Operations and Rate of Mortality during the Foregoing Periods.

Years Inclusive.	1854 to 1858 (Old Infirmary)	1859 to 1863 (Old Infirmary)	1870 to 1874 (New Infirmary)	1879 to 1881 (New Infirmary)	1885 to 1887 (New Infirmary)	1887 only.
Total Number of Operations named in foregoing Tables	95	119	136	263	161	59
Deaths ..	14	20	24	16	4	2
Rate of Mortality per cent. ..	14.73	16.80	17.65	6.08	2.42	3.39

If you will refer to the tables, you will observe in the first two quinquennial periods, when the old building had been practically condemned as unfit for its purpose, an average mortality of 14.73 per cent. and 16.80 per cent. respectively. These are far better than most of those published for that time. Then we come to the time immediately after entering the new building, and we get a mortality rate of 17.65 per cent. This was sufficiently alarming to cause an investigation to be made as to the cause. A contaminated water supply, unventilated drains, and other defects in the drainage arrangements were discovered, and partially remedied. This, no doubt, led to the more favourable figures we get for 1879-81 : 6.08 per cent. But cases of septicæmia occasionally occurred and other indications pointed to the conclusion that all was not yet right. After some demur, the Committee sanctioned further improvements, by having every waste pipe disconnected, closets ventilated, and, in fact, all that we asked for ; and the result of this is found in the figures for the last three years since the work was done. A mortality of 2.42 per cent., in 161 cases, for three years' major surgery, with a full proportion of cases of injury included in them, is the gratifying reward for the large outlay involved. This statement is one of the most satisfactory ever recorded for an aggregate of such cases. We can all select favourable years with a run of good fortune, as for example, in 1885 and 1886, when there were 32 major amputations, about equally divided for injury and disease, with only one death. But, if we take the two last series of 1879-81 and 1885-87 as representing our recent work, we find : 97 amputations, 8 deaths ; 57 amputations, 3 deaths. In six years, 154 amputations and 11 deaths. Mortality, 7.14 per cent.—a record of which no hospital need be ashamed.

It is abundantly clear that, however fine a building may be in its

arrangements for cubic space and general comfort and convenience, it avails little so long as the drainage system is wrong ; in this as in many things, we know more than we did a few years ago, and it is well for the community when an enlightened committee will second the efforts of the medical staff, as our Committee has invariably done. Were it otherwise, I should have a very different story to relate to you to-day.

The surgeon ought to be able to speak with authority, and he will best do that who can speak from his own knowledge. We are often asked about watering places, voyages, and special articles of food and drink ; and the surgeon will derive great advantage from gaining experience in all these as far as he can in his own *corpus vile* ; only in doing so I would advise him not to do as I once did at a famous foreign health-resort, drink of every spring in the place, and then go home to breakfast. He may wish he had not.

Then as to different climates. There is a tendency to send everybody to the South, whereas quite as often as not it is a bracing, dry air which is most needed, not a warm, relaxing one. Too often, fashionable and otherwise attractive places have some great drawback which is carefully concealed in guide-books, and can only be discovered by one's own personal observation. Therefore it is well to visit all the pleasant resorts he can, to make trial conscientiously of everything about which he is pretty sure to be asked ; but having done so, let the surgeon beware of putting his opinion into writing, or he may find himself made famous in a way he never intended in the pages of some advertising medium. So with regard to clothing. Here the married man has an advantage over the bachelor, whose knowledge of infantile and feminine garments is usually secondhand, and his advice of little use. It is well to note how susceptible to cold convalescents, especially children, usually are, and need advice accordingly.

It is an amazing thing how persons ordinarily gifted with common sense and good judgment are led away by some specious form of humbug, in the shape of a lapsed surgical instinct, such as that of bone-setters, *et hoc genus omne*. The death of one of these notable characters gave rise not long ago to some ridiculous articles in the daily press. Everyone of us is well aware in what the strength of these quacks lies, and there is no reasonable doubt that in some cases of stiff joints and such like, their rough methods succeed where others have failed. But how many of their failures do we hear of ? Where do we find recorded the histories of inflamed joints, of permanently injured limbs which are not infrequently the outcome of their attempts to cure ? I know of one instance where the ligamentum teres was torn completely through, and the patient lamed for life, by one of them.

It is too often forgotten that in the case of a surgeon who honestly and rightly makes a forcible attempt to overcome an old standing ankylosis or similar condition, and sets up thereby acute mischief, he is very naturally condemned by the patient and the friends for having made matters worse ; whereas, in the case of the bonesetter such a result is looked upon only as an accidental failure in what is recognised by an ignorant *clientèle* as his legitimate sphere.

No men, I imagine, belonging to any profession, have been the subject of so much popular ignorance, and the objects of such sarcastic attacks at the hands of popular writers as medical men, although I gladly acknowledge that we are greatly indebted to some of the most powerful literary organs for fair and generous treatment. Take, for instance that wretched caricature of "Heart and Science" written by an author who is supposed to know what he writes about. I do not hesitate to say there never was written in a novel a more vile representation of a modern scientific physiologist. Morbid sentimentality (which he is pleased to call "heart," forsooth !) is raised upon a pedestal for admiration, while the "science" of the advanced physiologist, simply because based upon vivisection, is reduced to the level of simple indulgence in brutal experiments. Such fictions as these may be all very fine for the edification of our young men and women, but we have a right to expect that an educated author will at least refrain from introducing such rubbish by a preface declaring their foundation in fact. We may very well, however, with our tried friend, *Punch* :—

Leave sham humanity its lies,
And cry God speed to men of healing.

I do not suppose for a moment that my experience of more than a quarter of a century's responsible hard work at practical surgery differs much, if at all, from that of other surgeons who have enjoyed similar opportunities, and the lesson I have learned and would impress on those who have not yet passed through such an ordeal is this—do to your patient as you would be done to yourself ; make up your mind as to the course to pursue, then act as quickly, as safely, and as pleas-

santly for the patient as your surgical instincts impel you. Let his or her welfare be paramount. Allow no golden apples like those of Hippomenes to hinder you in your course of duty. Remember how Atalanta lost the race, and let not such a fate be yours.

Gentlemen, we cannot stand still. The world will not wait for us, and whether we will or no, we must go onward. I devoutly hope that our course may be at the same time upward.

ABSTRACT OF AN ADDRESS

ON

THE MEDICAL STUDENT AND HIS ENVIRONMENT.

Delivered before the Harveian Society, January 19th, 1888.

By EDMUND OWEN, F.R.C.S.,
Retiring President.

ONE subject on which I wish to speak is that of medical education. If it be asked how this can interest the Harveian Society, I shall urge that every question concerns this Society which affects the welfare of our profession. Similarly it might have been questioned twenty years or so ago, what has this Society to do with so outlying a subject as that of baby-farming? But our Society not only interested itself in that matter, but instituted an inquiry upon it, and issued a report thereon, which went a long way towards the passing of a Bill in Parliament by which a scandalous waste of infant-life was, if not entirely done away with, at least brought within comparatively narrow limits. Honour to whom honour is due. Let us not forget that the two members to whom not only our own thanks, but also those of the whole State, were chiefly due are Messrs. Ernest Hart and Curgenven.

In this age of specialism the student is taught that there are special centres for almost every operation and function throughout the economy, a centre for heat, another for respiration, and one for micturition. It may be that this is all correct, and that its acceptance will be co-existent with the science itself. Certainly it is correct at present, at least, as a subject matter for examination purposes, and as affording a good working hypothesis. But it is quite within the range of possibilities that, before another generation is set to work, the entire science of physiology will have to be rewritten in the light of fresh acquirements, and with entire disregard of such centres.

Froude truly says, "Philosophical belief at the bottom means a 'perhaps' and nothing more"; nevertheless, we are teaching it as if we were assured of its being truth itself. Thus I have heard it urged by an enthusiastic apostle of science that Haeckel's interesting work should be straightway constituted the recognised authority upon the history of creation, and that a knowledge of it should be rendered compulsory in every student of art and science. Let it be read and enjoyed by all means, but at the same time let us remember the words which its translator uses in another place (*Degeneration*, by E. Ray Lankester, M.A.): "In everyday life we have often to be content without fully testing the truth of our guesses, and hurry into action based on such unverified suppositions."

Twenty-five years ago physiology, as taught in our medical schools, was not worthy of the name of science; now she has developed into a subject of vast importance, and anatomy has had to make way for her. But I think that physiology has now raised herself to fully her proper position as a subject in the education and examinations of the ordinary medical student. The average student wishes to qualify himself as a trustworthy practitioner of medicine and surgery, not merely as a man of science. But with this increasing intellectual pressure the student of to-day is himself somewhat changed. In obedience to a natural law the individual student has adapted himself to the environment. The medical student of to-day is, by his previous education and by intellectual development, vastly superior to his homologue of a few generations back, and to what he was as I first knew him twenty-five years ago.

The medical student of to-day is crammed with a store of teaching which would do credit to a nineteenth century Solomon. He is expected to know a good deal about most branches of natural science, from the confere—I would say, but for some reason it does not happen to be "official"—from the cedar of Lebanon to the bacillus that grows on the wall of the tubercular cavity; and yet, with all this, the day still contains but twenty-four hours, and the average weight of the

human brain has not perceptibly increased. His studies err in the way of diffuseness, and he does not know how much or how little will be eventually required of him—unless, perchance, he has had the advantage of attending the special course of instruction by the gentleman who is going to examine him. His examinations ought, therefore, to be conducted on the broadest lines and in the most liberal spirit. Unfortunately, he is not sufficiently left alone at his work. It is a case of lecture and demonstration, demonstration and lecture all day long, and sometimes in preparation for examinations, which are a test of cram rather than of knowledge.

There are several matters in which the environment has, however, recently been endeavouring to adapt itself to the student, in each case with the best intentions; but in each case with unfortunate results, at least in my opinion. Its method of procedure seems spasmodic and speculative. First, in the praiseworthy endeavour to insure that a student works in his first summer—a part of the year which in my time was chiefly dedicated to cricket and outdoor amusements generally—the powers that be have instituted a compulsory examination in materia medica and chemistry, which is held at the end of the first July. The idea of this first summer examination is excellent, if only the men would pass it. But, as a matter of fact, they do not; and the result is that, at the beginning of the second winter session, when they ought all to be settling down to the important work of the dissecting-room and the physiological laboratory, they are frittering away golden time over flowering tops and sliced corns, over test tubes and sulphuretted hydrogen. The occupation is harmless in itself, I have no doubt; but it amounts to little less than a crime when it is carried on at such a time.

If the men who have failed at this summer examination start work in October on the studies proper to that season, they do it in an uneasy, half-hearted way.

I sincerely believe that a knowledge of materia medica and chemistry is of the greatest advantage to us all, but I greatly regret that the medical student should be submitted to the risk of having his entire career wrecked over an attempt to acquire it. Yet so it is. And I therefore take this opportunity of urging that the requirements in these subjects be reduced to the minimum, and that the student be compelled to pass the examination in them before being registered at a medical school. This semi-professional examination would then be a boon to the medical student, for it would set him free for his proper school work; to his parents and guardians it would be a sort of test for his fitness for the profession which blind chance or stern necessity seems to have chosen for him; to the teachers of physiology and anatomy the change would be most blessed.

Another "adaptation" is that by which the student is permitted to break up the subject matter of his various examinations into small fragments. Chemistry now, materia medica later; anatomy without physiology; surgery divorced from medicine, and medicine from obstetrics. There is one particular in which, with all respect I say it, this new system is directly productive of harm to medical education. I refer to the power which the candidate now possesses of passing his examination in physiology when he is absolutely ignorant of anatomy, and *vice versa*. The fallacy, it seems to me, is abundantly manifest, but to make it absurdly clear let me cite an instance that occurred only last week. A candidate was asked by an examiner in physiology a simple question, the answer to which involved an elementary knowledge of the brain. Thereon the candidate politely informed the examiner that he did not know anything about the anatomy of the brain, that he was "only up for physiology" on that occasion.

There is an excellent way, it appears to me, of escaping from the dilemma without injustice to the student, and that is by issuing a syllabus of those physiological functions and processes in which a sound practical knowledge will be required. Better a sound knowledge in a dozen of the chief physiological functions than what I will call an official minimum thinly spread over the entire science.

Before ending my remarks upon medical education, I feel it my duty to lay bare before you what I consider to be the most heartless regulation of modern days. It has been issued by the University of London. After that terrible ordeal of the Preliminary Scientific Examination, there comes another of only slightly diminished rigour in anatomy, physiology, materia medica and organic chemistry. At the July holding of this examination, when the weather is apt to be hot and sultry, and the examiners would fain be getting away, they find their labours shortened for them in a most delightful manner, but entirely at the expense of the unhappy candidates. Formerly, those who had succeeded in passing the examination, and had sufficient energy left, were allowed to enter the lists for honours. But the Senate has recently enacted as follows:—

Every candidate for the July examination, on sending in his name for the