ON THE TREATMENT OF HÆMORRHOIDS, AND THE COMPARATIVE MERITS OF THE OPERATION BY THE CLAMP AND BY THE LIGATURE.

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In a paper by Mr. Henry Smith in the last two numbers of THE LANCET on the treatment of hæmorrhoids and prolapsus of the rectum by the clamp and cautery, founded on his experience of 400 cases, he alludes to certain criticisms of this procedure, and of his mode of advocating it, which have from time to time appeared. Amongst other things he says: "Just to show the extraordinary nature of the opposition which has been urged against the operation, I may state that one well-known surgeon wrote a long letter to THE LANCET denouncing the operation. Luckily for me, but most unluckily for himself, the writer let it appear that he had never once made trial of the operation."

Finding that I am the surgeon alluded to, and that these observations refer to a paper published in THE LANCET of Sept. 2nd, 1865, I feel it necessary to say a few words in reply, for the purport of my remarks is here completely misrepresented.

I have never "opposed" or "denounced" the operation with the clamp. In the paper referred to I was, on the contrary, very careful to disclaim all intention of depreciating it, believing it to be a sufficiently effectual method of dealing with the complaint, though I could not admit that it was better, and there was not a shadow of proof that it was safer, than a properly conducted operation with the ligature. My observations were directed against the unfair comparisons made by Mr. Smith between the two operations, and the extravagant laudations which he was constantly in the habit of bestowing on the one at the expense of the other—laudations which equalled, if they did not surpass, those which the profession had been accustomed to hear for some years previously from the same authority respecting the extraordinary merit of nitric acid in the treatment of this disease.

I also protested against the peculiar pathological doctrines enunciated by Mr. Smith in support of his views, when he asserted that "it is impossible for any surgeon conscientiously to tell his patient that there is no danger whatever after the ligature; but this may be *most truthfully stated* with regard to the operation with *my improved clamp*, if the most ordinary precautions are adopted to prevent bleeding." And again, when he said, "It is *not possible* that either tetanus or pyæmia, the two most formidable results of the ligature, can occur after this operation, because the condition which produces the former affection does not obtain—viz., the presence of an irritating substance round the nerves for several days; and pyæmia and other inflammatory affections will be effectually prevented by the exposed surface being deprived of its vitality and the veins being blocked up by the cauterisation." I ventured to point out that burns were a class of injuries by no means exempt from a liability to be followed by tetanus; and that it was an entirely new idea that the application of the actual cautery to cut surfaces was an effectual guarantee against pyæmia and "other inflammatory affections."

It is all very well for Mr. Smith to say, in effect, that as I had then never practised the operation with the clamp myself, I could not possibly know anything about it, and therefore that to any remarks of mine "no answer need be made." I submit, however, that it was not necessary to have performed this operation to appreciate the fallacy of the statements above quoted, or of the argument that, when a sloughing wound is made in the interior of the rectum with the actual cautery, the patient will be convalescent in one-third of the time required when a slough is made in the same situation with a ligature. I spoke, however, from the careful observation of a considerable number of cases operated on with the clamp by my colleagues. Since then I have repeatedly practised that method myself, and have witnessed it in the practice of others; but I see no reason, after ten years, to alter the opinion which I then expressed,

that it is not safer or in any way better than a properly managed operation with the ligature.

The result of Mr. Smith's experience of 400 cases forms, without doubt, a very valuable contribution to practical surgery; and when we learn that out of this number he has only met with four deaths, it will, I trust, help to allay the vague apprehension which exists, even in the profession, respecting the risks attending operations for this disease. But I contend, at the same time, that he has not yet succeeded in demonstrating the superiority of the clamp and cautery over the ligature; and I do so on the following grounds. I have myself operated with the ligature, at St. Mark's Hospital and elsewhere, on more than 800 cases, with only three deaths; while Mr. Allingham, in his book published in 1871, states that he had then operated on 400 cases, without any death at all. With respect to pyæmia, no death from that cause has occurred in my experience, and Mr. Allingham states that 3210 cases in St. Mark's Hospital have not furnished a single example of it, though he refers to four cases of death from that cause in the practice of other surgeons after the operation with the clamp and cautery. I have no desire to maintain that the ligature possesses in this respect any peculiar advantage over the clamp, for I believe the tendency towards pyæmia will, in the long run, be found to be about equal in both; but the facts which I have stated effectually dispose of the peculiar immunity from pyæmia formerly claimed for the clamp by Mr. Smith, and also of his recently expressed opinion that "the complete sealing up of the vessels produced by the hot iron is the very best safeguard against pyæmia we can have." I am quite at a loss to see how vessels are more completely sealed up by cautery than by ligature; in fact, if the argument is worth anything, the ligature ought to be superseded by the cautery in surgical operations wherever practicable, in order to diminish the liability to pyæmic infection.

The most serious objection to the operation with the clamp is its liability to be followed by hæmorrhage. Mr. Smith himself now candidly speaks of this as "the result against which the surgeon has most to guard, and unless he takes very great care it is an occurrence very likely to take place." He mentions cases in which it took place to a rather serious extent immediately after the operation, and others in which it occurred a few days afterwards, when the bowels were relieved. In the latter it probably arose from the vessels being reopened in consequence of the slough being detached or disturbed during the passage of the fæces over the wounded surface—an indication that they are not so efficiently closed by cauterisation as when they are securely embraced by a ligature. A lesser degree of hæmorrhage seems to be not unfrequent, for we are told that "sometimes a good deal of blood is passed on the first action of the bowels, and on examination it is found that the greater part of this evacuation consists of dark coagulated blood, which had evidently slowly escaped into the bowel after the operation, and had remained there until the action took place," another indication that all the divided vessels are not completely closed by the cauterisation.

Were it not for the danger of hæmorrhage there would probably be little to choose between the two modes of operation; they are, in fact, only different ways of doing the same thing. From what I have seen I believe them to be as nearly as possible equal as regards the danger to life, and also as regards the ultimate result, the subsequent pain, and the time required for recovery; and I have seen nothing to justify the assertions that the method with the clamp is in any of these points superior to the other. But the danger of bleeding, which is confessedly a real one, is sufficient, in my opinion, on Mr. Smith's own showing, to justify the condemnation of the operation with the clamp in all cases where the disease is far advanced and large vessels are involved. One of the fatal cases which he records is significant. It is that of an elderly gentleman with very severe prolapsus. A very vigorous application of the cautery was necessary to arrest the bleeding, and the patient died on the fifth day from peritonitis. Mr. Smith does not doubt that the peritonitis was produced by the excessive employment of the cautery, and thinks it possible that he may even have injured the peritoneum. Surely in any case where there is a chance of such severe cauterisation being required, the operation with the ligature must

be the safer of the two. I have myself never hesitated to use it in the most extensive cases of disease, and have never yet had occasion to repent having done so. I have only to add, in the words of Mr. Smith, slightly altered, that if he does not yet see the merits of the treatment by the ligature so clearly as I do, I can only hope that his conversion may arrive in time.

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ON FATIGUE.

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THE recent discussion in the pages of THE LANCET on the effects of overwork, to which Dr. Wilks, Dr. George Johnson, and Dr. Savage have contributed their experiences, has induced the author of this paper to reduce his views on the same subject to a definite form, in the hope that they may prove interesting.

Work results in fatigue, and fatigue is a regular and constantly returning symptom experienced by all of us. Periods of functional activity invariably alternate with periods of repose, during which the waste caused by the exercise of function is repaired. We are indebted to Sir James Paget for having pointed out in his Croonian Lecture, delivered some years since before the Royal Society, that "rhythmic nutrition" is a law of nature; but, although the truth of this dogma is recognised on all hands, and may be said to be axiomatic, it has hardly received that careful consideration at the hands of practical physicians which it deserves.

Our whole life consists of a series of vibrations—periods of tension alternating with periods of relaxation; and, although the rapidity of these vibrations varies immensely, they are recognisable in all our acts, be they voluntary or involuntary. Let us look first to the "vibrations" of an organ the movements of which are placed entirely beyond our own control—the heart. Now, the rate of vibration of the heart is 72 per minute, and if the total period of each vibration be divided into ten parts, it will be found that four of these parts are devoted to the process known as *systole*, which may be looked upon as labour; three are occupied by the *diastole*, which, although hardly labour, is nevertheless exercise of function; and the remaining three parts are occupied by the *pause*, during which the heart apparently enjoys absolute rest from any exercise of function, and may be considered to be in a condition analogous to sleep. May we not apply the rate of action of this organ, which has been regulated for us, to our voluntary acts, and may not the heart be made to give the key-note, as it were, to many questions, personal and social? If we divide the day of twenty-four hours into ten equal parts, and give four of these to active work, three to functional exercise of other kinds, and three to sleep, we shall find that nine and a half hours' work, seven and a quarter hours' "relaxation," and seven and a quarter hours' sleep, is what a normal man may perform without injury to himself. "Eight hours' work and eight hours' play, eight hours' sleep and eight shillings a day," is said to be the dream of the trades unions, but, if they are guided by the heart, they ought to add an hour and a half to the period of labour, and take three-quarters of an hour from each of the other divisions of the day.

To continue with the consideration of our "vital vibrations," I may remark that it is universally ordained among civilised nations that once in every seven days there shall be a remission of labour and a change of occupation; and we further recognise the fact that it is highly advisable for those who are occupied in monotonous pursuits to break away from them at least once a year, and indulge in that variety of work which we call amusement. Monotonous repetitions of the same act are acknowledged, on all hands, to be the most potent causes of fatigue. "It aint the untin as urts im," said *Punch's* horse-dealer, "it's the ammer, ammer, ammer on the arduous roads;" and in this remark there was undoubtedly much practical wisdom which is very generally applicable.

Fatigue occurs directly we attempt to alter the rhythm

of our vital vibrations by prolonging the periods of tension at the expense of the periods of relaxation, or by demanding for any length of time a quickening of the normal rate of vibration; and it is not unreasonable to suppose that every organ of the body has its "normal rate of vibration," if we could only determine what it is.

We recognise the fact that athletes who "over-train" run risks of cardiac troubles and loss of wind; that the man who, from any cause, is unable to sleep runs a serious risk of permanent impairment of health; and when we find patients pursuing their avocations too zealously we know that, if such offence against the laws of nature be persisted in, general paralysis or other form of "break-down" is likely to be the result.

Fatigue may be general or local, and both forms may be either acute or chronic.

That fatigue in all its forms is due to impaired nutrition there can be little doubt, and we shall find that the symptoms of chronic fatigue are often the prelude of definite and recognisable degenerative changes.

As to *general fatigue*, it is recognisable with ease both in its acute and chronic forms. There is a disability for performing either mental or physical work, and this disability is noticed first in work requiring attention and sustained effort, and, lastly, in those acts which have become automatic. The symptoms of general fatigue are referable usually to the brain and nervous system.

As to *local fatigue*, this, again, may be acute or chronic, and the symptoms of it are referable usually to the muscles; but we must always bear in mind that muscle and motor-nerve are one and indivisible, and that recent experiments have given great probability to the idea that every muscle is connected with a certain definite spot in the brain. When, therefore, we speak of a sense of fatigue we must necessarily be in doubt, notwithstanding the fact that the symptoms are referred to the muscle, whether brain, nerve, or muscle, one or all of them be really at fault. The symptoms of acute local fatigue are (1) *loss of power* to a greater or less extent. By too frequent or too prolonged stimulation the irritability of muscular tissue becomes exhausted, and it either refuses to respond or responds but feebly to the stimulus of the will; our power of adjusting the force of contraction to the act to be accomplished is lessened, and accuracy of movement and delicacy of co-ordination become impossible. (2) *Tremor* is a symptom of acute local fatigue, which everyone who has been called upon for extraordinary muscular effort must have experienced. (3) *Cramp-like contraction* is the symptom of local fatigue which disturbs our rest after a hard day's walking or riding, or muscular efforts in the ball-room or elsewhere. (4) The *pain* of fatigue is familiar to most of us, and is readily distinguishable from other forms of pain.

Local fatigue is caused far sooner by prolonged and sustained muscular effort than by repetitions of short muscular efforts having due intervals of relaxation between them. Anyone who has attempted to hold out a weight at arm's-length knows the impossibility of a long continuance of the effort, and it is proverbially true that standing in one position is to most people far more tiring than walking, the reason apparently being that in standing the muscles which support the body are subjected to a prolonged strain, while in walking we use the muscles on either side of the body alternately. The great increase of working power which we obtain by this alternating use of the muscles would seem to be one of the chief reasons for the bilateral symmetry of the body. Not only is sustained effort a far more potent cause of fatigue than repeated effort, but we find that, when fatigue supervenes, actions requiring sustained effort, be they physical or mental, are the first to fail, while automatic actions endure the longest, and in this respect local fatigue resembles general fatigue. It is quite possible to exhaust a muscle by artificial stimulation, and if one of the small interossei muscles of the hand be continuously faradised, it will be found that in a short time its power of contracting under any form of stimulus will be absolutely abolished. It is tolerably certain that the brain can have no share in artificial fatigue thus produced, and there seems good reason to suppose that in some people of energetic temperament the irritability of a muscle may be exhausted while the power of mental stimulation remains unimpaired.

Chronic local fatigue has causes and symptoms similar to