Hygienic surgery / by Fred. K. Etlinger.

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With compliments from F. K. Etlinger

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HYGIENIC SURGERY.[1]

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In discussing the relations of therapeutics to disease, there is no more important consideration to be borne in mind than the fact that all living tissues naturally reäct to injury unless they are immediately destroyed thereby; that is to say, the therapeutist has not to reckon with the action of disease on an inert body, but with a complicated condition brought about by two distinct factors, the action of the disease and the reäction of the tissues. It must not be supposed, however, that this implies the existence of any specific property or force in the tissues; there is no independent entity in connection with the resistance to disease, and for this reason it is as well to avoid the use of such equivocal terms as the "natural resistance of the body." The different ways in which this reäction is exhibited form a subject which is too large to be considered here, and for the present purpose it will be sufficient to repeat that all living tissues reäct to injury.

As a result of this, therapeutics resolves itself rationally into two parts, namely, treatment which aims at the removal or direct counteraction of the cause, and treatment which aims at helping the body to make good the injury. As examples of the former or direct treatment may be mentioned the internal administration of antiseptics to destroy micro-organisms within the body, and the injection of antitoxine in diphtheria to counteract the products of the diphtheria-bacilli; of the latter or indirect treatment, the sanatorium treatment of consumption forms a good illustration.

The tendency has been to exaggerate the value of the first or direct method, and this has led to many disappointments; for instance, the injection of antiseptics in septicæmia, intra-pulmonary injections and inhalations in tuberculosis, even the washing of a wound infected with staphylococci—all

[1] A Paper read before the Medical Society of University College Hospital.

these and many more have been tried enthusiastically, and have either failed, or proved to be of far less value than was expected.

It is only in the field of preventive medicine that this method of treatment has met with real success so far, and here its importance cannot be over-estimated. In public and private sanitation excellent results have followed the plan of systematically attacking microbes before they come into contact with the body; but by going a step farther back, hygiene could effect still better results by avoiding the organisms altogether, or by at least preventing their accumulation in dangerous numbers.

When once the organisms have entered the body, it is easy to see the great difficulties in the way of reaching them with any forces sufficiently powerful to destroy them, so that the comparative failure of direct treatment is natural. The only rational development of this method has been the use of substances prepared by the tissues themselves; and serum-therapeutics has already met with a certain measure of success, and is a subject of very great importance. As yet, it is still in its infancy, but when more fully worked out, tested and improved it may be expected not only to take the foremost place in direct treatment, but to elevate this method to a position much higher than it at present occupies.

In helping the body to make good the injury indirect treatment aims at the following conditions: firstly, the prevention of reïnfection, and secondly, the improvement of the general condition.

Taking these parts separately, prevention of reïnfection, either by the same or other organisms, leaves the body free to fight its best against those which have already gained a foothold, and relieves it from the extra strain of having to combat any further attacks of hostile microbes. This is one of the chief principles of the sanatorium treatment of consumption, and is effected mainly by free ventilation which has been proved to arrest the virulence of tubercle and other bacilli and even to cause their death, particularly if aided by sunlight, though it will do so even in the dark. For this reason the rooms are made and furnished in a special manner, so as to admit of thorough ventilation and scrupulous cleanliness;

and in all well-conducted sanatoria strict precautions are adopted and rules enforced with regard to spitting and the disposal of the sputum, in order to diminish, as far as possible, the risks of reïnfection.

But it must not be supposed that it is only in the treatment of tuberculosis that the prevention of reïnfection applies; it does so in all diseases, whether primarily infective or not. It is in this way that so-called intercurrent affections are preventable, and in such cases as heart-disease, renal disease, cirrhosis of the liver, &c., prevention of infection would at any rate diminish the liability to those bouts of illness which are so apt to bring about a fatal termination. In organic heart-disease, for instance, the tissues, left to themselves, may be quite able to cope with this successfully and to bring about efficient compensation by such processes as hypertrophy; but they may not be able to maintain it, if there arise further calls on their powers, such as infection by the organisms of the common "cold," of influenza or of pneumonia, whereas by adopting an open-air life all these affections would be avoided.

Considering next the second aim of indirect treatment, what are the means at our disposal for improving the general condition? Firstly, there is *air*. The body needs a constant supply of air, and this must not be lacking either in quantity or quality, if the machine is to work at its greatest advantage. The chief indication for providing air which is fresh and pure has already been considered under the heading of prevention of reïnfection, and this must be supplied liberally and constantly, in order that it may not become polluted, and so that even the slightest degrees of asphyxia are avoided. The quantity of air provided should be such that, even indoors, it is as frequently changed as it is outside; and in quality also the standard out of doors should constantly be maintained in every part of the sick-room, so that a patient never breathes air which has already been respired and contaminated either by himself or by others.

The second most important means of improving the general condition is by suitable *food*. In order that the tissues may best be able to combat disease, it is necessary to keep them properly nourished; and by judicious and liberal feeding the body-weight should be brought to its normal limit, and

maintained there, or at a point slightly above the normal, so as to have a small reserve in store.

Thirdly, the subject of *exercise* must be considered. Activity of the tissues is necessary, not only in order to maintain their nutrition, but also to insure the proper performance of their functions; on the other hand, they require to remain passive at certain times and under certain conditions, so that, starting with absolute rest, we have also at our disposal, as therapeutic agents, massage and special exercises, and also general exercises, such as riding, cycling, and, most important of all, walking.

In order to point the contrast between improving the general condition and increasing any specific resistance to disease, we may consider an infected body as a garrison besieged by a hostile force. Direct treatment corresponds with a relief-party, which in its turn makes an attack upon the enemy; but indirect treatment leaves the garrison to deal with the besiegers and confines its attention either to driving off the enemy's reinforcements, or to conveying food to those within the castle. Thus we see that indirect treatment only indirectly affects the reäction of the tissues by nourishing and supporting them whilst they themselves do the work.

So far we have considered the aim of therapeutics and the possibilities of scientific hygiene; let us now see how far these principles have been applied in surgery. Both in operative and non-operative surgery very little attention is devoted to maintaining and improving the general condition of the body. Thus it is customary to keep both hospital wards and private sick-rooms quite inadequately ventilated; no attempt is made to supply the patient with the continuous current of fresh air, which we have seen to be so essential, and he is forced to breathe an atmosphere which, instead of being a therapeutic agent, is often highly dangerous even to a healthy man. In the matter of food also, the tendency is rather to lower the general condition by giving too little nourishment, and that often of the invalid kind, when in many cases plenty of solid food is urgently required to increase or maintain the body-weight. Then as regards exercise also, the question is seldom properly considered, and indications for employing massage or regulated exercises, for instance, are

frequently neglected. Certainly no attempt has been made to apply these principles generally in every surgical case; and it is only in certain few special instances that they are tried at all, and then very imperfectly and without any real recognition of their importance or of the necessity for considering them constantly and exactly in relation to every individual case whatever it may be.

In the treatment of tuberculosis for instance, as at Margate, there is no exact regulation of diet or of rest and exercise, nor is it seen that the patients have a liberal supply of perfectly fresh air day and night without intermission; and yet the results of even the partial and unconscious employment of hygienic measures show a certain degree of success, which has led to the vague supposition of some specific quality in the Margate air.

Again in the Weir-Mitchell treatment, though this is more medical than surgical, there is the same incompleteness and unreasonableness; the questions of rest and exercise, and also of food, are attended to, but more or less blindly, whereas the importance of thorough and constant ventilation is altogether ignored.

The great mistake is made of thinking that only tubercular cases require hygienic treatment; but are the results of surgery in other diseases so perfect that we need not try to give every advantage in them also? Unfortunately this is not the case; and since it has been clearly proved that hygienic methods are beneficial in tubercular cases, even when partially employed, surely they should be thoroughly and scientifically tried, not only in this disease but also in every other surgical case. In all "septic" cases, for instance, there are strong indications for systematic hygienic treatment, and the following facts help to point the moral. In phthisis it is the septic symptoms which yield most readily to "open air" treatment. Again where there are septic sinuses in tubercular cases it has long been recognised that plenty of fresh country air and a liberal dietary are the greatest helps to healing. Yet again one can say from personal experience of a series of cases of appendicular abscess, opened and drained in hospital, that the discharge often continues for weeks or months until the patients are sent away to country or seaside air, when it ceases rapidly,

and the wound heals, sometimes in the course of only a few days.

Not only in tubercular and septic cases, but in every case of surgical disease, the patient should be supplied with a continuous current of fresh air, day and night, throughout the treatment. If circumstances permit, he should spend at any rate the greater portion of his time out of doors; but when indoors, he should be in a room which is constantly ventilated in every part, and in which the air is always as pure as that outside. The diet should be abundant and nourishing, and should be judiciously pressed until the body-weight has reached its normal limit, when the amount of food should be diminished. Rest or exercise should be regulated according to the requirements of the body, and in every case this should be attended to exactly and systematically.

Since this is the ideal we may state now two propositions which appear to be invincible: firstly, that all cases which are now known to improve are likely to do so with more certainty if placed under these conditions; secondly, that any disease which has ever been known to recover spontaneously is more likely to do so if these principles are carried out. Remembering these two important propositions we may briefly consider one or two diseases.

In surgical tuberculosis there can be little doubt that very good results would attend hygienic treatment, and this has frequently been advised, though only in a very incomprehensive manner, as for instance in the article by Mr. Tubby published in the *British Medical Journal* in February, 1903, in which he advocated the treatment of external tuberculosis, particularly in children, in country or seaside hospitals rather than in towns. Mr. Tubby's view appeared to be that improvement would result owing to the different quality of country air, as opposed to town air; but though this is perhaps true, it is an almost infinitesimal part of the whole truth.[1]

A very interesting article by Dr. Douty was also published in the same journal about the same time. This was entitled

[1] When writing the above, I had not seen the article in the *British Medical Journal* of October 17, 1903, by Mr. Deanesley, of Wolverhampton; having now done so, I find that it is no longer true that the open-air treatment of surgical tuberculosis has not been efficiently recommended.

the "Open Air Treatment of Syphilis," and in it he pointed out that the well-nourished, healthy sportsman, leading an out-of-door life, suffered lightly when infected with syphilis, whereas the underfed, stay-at-home scholar was attacked much more severely, and this in spite of the fact that the former frequently neglected his mercury. Dr. Douty deduced from this that "open air" treatment would be of benefit in syphilis, and strongly advocated its adoption in all cases. There is indeed every reason to expect that the conclusion is correct, and this valuable suggestion should certainly be acted upon.

In such cases as lymphadenoma and actinomycosis it is reasonable to expect that good results would follow if treatment were conducted on these lines, as in these cases we have to rely almost entirely on the reäction of the tissues themselves and by improving the general condition we are helping the body to make good the injury.

Lastly, it is impossible to pass over malignant disease without mention, though it might be safer to do so. Let us be content with remarking that since occasional spontaneous recovery is recorded, it is evidently not impossible for the tissues to overcome and survive this injury; and this being the case, it is perhaps justifiable to hope that by placing the body under the most favourable conditions the chances of recovery would be increased.

Up to now we have been discussing hygienic treatment as a method of cure, it must next be considered whether we are justified in excluding any patient whatever from its benefits.

In plastic surgery—using the term in its widest sense to include all cases where there is deformity but no disease—the first essential is that the patient should not be operated upon until he is in perfect health; and if the general condition is not at its best, it should be improved before operation by the methods we have been considering, namely, by fresh air, by food, and by regulated rest and exercise.

Next, at the operation itself as little damage as possible should be done to the health of the patient, and for this reason it is important that the full allowance of fresh air should be provided. It has been found that the wound is not very liable to be infected by the air, but none the less, for the sake of the wound alone, the air should be as fresh as possible, so as to

avoid every possible risk. More important, however, is the necessity for pure air for the patient to breathe throughout the operation, and the supply in hospital theatres and in private operating-rooms is, as a rule, hopelessly inadequate. In view of the necessary presence of several other persons besides the patient, nothing less than widely-open windows will admit sufficient air, and if a free current from outside were allowed to pass continuously through the room the bad effects of all operations would be much lessened, and many respiratory troubles and other infections would be avoided. The aim of the surgeon should be to limit the injury he inflicts as much as possible, and it is just as important not to poison the patient with foul air as it is not to poison him with antiseptics. During the recent South African War soldiers who were operated upon in the open recovered in a remarkable manner, and there is no doubt that this was owing to the impossibility of excluding fresh air from the patients and not, as has been so frequently stated, to some peculiar healing power possessed by the air in South Africa. The danger of exposure to cold need not be an obstacle in the way of efficient ventilation, as it would be easy to protect the patient with suitable coverings, only the immediate site of the operation being exposed, and hot-water bottles and even a heated operating-table can be used.

After the operation also strict hygienic treatment is again necessary, so that the tissues may quickly and easily repair the injury; and it must be carried out just as before, every detail being carefully attended to.

We have seen now how important it is that every surgical case should be placed under ideal hygienic conditions, and it cannot be too strongly insisted upon that this should be the first aim of the surgeon. Specific treatment of disease is at best limited and often unsatisfactory, but it is useless to test the powers of any specific remedy until the tissues are in a proper condition for making the best use of it.

There will be no harm in repeating once more what is meant by ideal hygienic conditions. Every possible source of infection or reïnfection must be avoided, and the general condition of the tissues must he built up and maintained, so that all the physiological functions of the body are performed as

perfectly as possible. We must have a constant and uninterrupted supply of fresh air as the first essential; an abundance of nutritious and well-cooked food, judiciously given and insisted upon, in order to bring the body-weight up to its normal point and to maintain it there; and careful and systematic regulation of rest and exercise in order that strength may be increased without exhaustion.

These points practically form the basis of the sanatorium treatment of consumption, and it is the application of the principles and details of this treatment, specially modified to meet the requirements of individual cases, which is now advocated as the strongest weapon we can employ in the treatment of every kind of surgical affection.