An Address ON SURGERY—GOOD AND BAD.*

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I AM deeply sensible of the great honour done me in electing me to the new Chair of Surgery in this university. It is not given to everyone to participate in the inception and development of a new University Medical School, and such a position carries with it great responsibility but equally great interest.

In the teaching of surgery the personal factor plays a prominent part, and the type of teaching reflects the line of thought of the teacher. It has been my good fortune for several years past to sit at the feet of one of the greatest exponents of the art in the United Kingdom—I refer to Professor Rutherford Morison of my late university. His chief object was always to inculcate general principles as far as possible and to apply them whenever it could be done. The result was a reduction of surgery to a simplicity and comprehension not commonly seen, and a correspondingly rapid acquisition of a practical knowledge of it.

Such an occasion as this appears to me most opportune to give some indication, necessarily limited, of the line along which the subject will be taught in this school. The disciple is not always a replica of the master, and while one may describe the teaching as Morisonian, it will be readily appreciated that it will be so as interpreted by me.

The subject chosen by me for this address is "Surgery—Good and Bad," and the chief point in it is the position of operative interference in surgery. It is roughly divided into two parts; the first a more or less technical exposition, and the second the deductions to be made from it.

It is a great pleasure and honour to have Sir John Bland-Sutton present here this evening. His world-wide fame precludes the necessity of any introductory remarks about him; but it is a very happy coincidence that he should arrive in Capetown at this particular time, seeing that he was one of the committee of eminent surgeons who elected me to this chair and was the last of them I saw before leaving England. I must say that he was very enthusiastic about the post and optimistic about the future of the school.

There is a popular belief that the terms "surgery" and "operation" are synonymous, and one is quite accustomed to hear the platitude that the "surgeon is the man who is always cutting people up." This erroneous conception of the surgeon and his work ought to be dispelled, and the people to dispel it should be the surgeons themselves.

The primary object of the surgeon is not "operation," but the cure of the individual by whatever means are at his disposal, and in so far as operative interference may be necessary in bringing about that cure, it plays its part in surgery. What its exact position is, however, can only be shown by a consideration of surgical principles.

The study of disease in all its aspects, using the term in its widest sense, is the work of both physician and surgeon, and its subdivision into medicine and surgery is for the most part arbitrary. Under the heading "Medicine" are commonly grouped those diseases in which operative interference is not necessary or is not likely to be so, while under "Surgery," on the other hand, are included those in which such interference will be or is likely to be necessary. At the same time, it will be readily appreciated that there is a great deal of overlapping, and many so-called medical diseases may develop conditions requiring surgical interference, whereas, similarly, many surgical diseases present medical aspects or complications.

All disease, whether medical or surgical, has a cause, although it is not always obvious and in many cases is unknown. The causes of disease are those influences which produce in the individual a departure from the

normal. They are commonly known as irritants, and are subdivided into two classes:

1. *Non-infective*, including mechanical, electrical, chemical, and thermal agents, x rays, etc., and
2. *Infective*, the chief being the micro-organisms.

The consideration of the various phenomena arising out of the relationships of the irritants to the individual constitutes the subject of irritation. Always keeping in mind the presence of a cause, the subject of irritation may be regarded, pathologically, from three points of view: (1) Its effects; (2) the reaction of the individual to it; and (3) its complications.

In teaching one has been accustomed to subdivide the body, for purposes of generalization, into three main sections:

1. *The Composite Tissues*, including the connective tissue, vessels, nerves, lymphatics, etc., of the part.
2. *The Hollow Muscular Systems*, comprising the alimentary, vascular, respiratory, and genito-urinary systems.
3. *The Serous Cavities*, including the peritoneal, pleural, pericardial and cerebro-spinal, the tunica vaginalis, and the synovial membranes of joints, tendon sheaths, and bursae.

Let us consider, then, for a moment the pathology of irritation in its relation to the composite tissues.

1. *Its Effects*.—The effects, which are essentially destructive, are found in all degrees of seriousness. They comprise *Injury*, and are divisible into general and local. The general effect on the individual is that depression of vitality which is called *Shock*, whereas the local effects depend on the structure and the function of the part affected. The most important point in the structure is that of vascularity, and the correspondingly important effect resulting from injury to vessels is that of *Hæmorrhage*. The variation in the functional derangement requires no elaboration, as it tends to be special to the tissue involved. The local effects may be grouped together and constitute a "*Wound*," though this gives a much wider significance to the term than is customary, and includes "destruction of any tissue, of any degree, in any situation, and by any irritant, non-infective or infective." Whether the skin is involved or not, whether soft or hard tissues, and whether it is produced by violence or any other agent, is immaterial.

2. *The Reaction to it*.—In considering the reaction we have to deal with two separate factors: (1) the irritant itself, and (2) its effects. Whether the reaction be to either or both of these, the main part of it is essentially the same, and consists of *vascular and cellular changes*. It is known as *Inflammation*, and may be either acute or chronic. In acute inflammation the vascular changes predominate, while in the chronic variety the cellular changes are the most pronounced feature (Rutherford Morison). When the reaction is limited to the effects—that is, to the destruction produced—it constitutes *Repair*. The much vexed question of tumour formation is too uncertain and involved to be introduced in this address, though I have little doubt that in due course it will be shown to be simply one of the manifestations of tissue reaction to irritation.

3. *The Complications*.—As a wide generalization, one may say that the complications of irritation depend upon increase of the irritation, either from exaggeration or extension of the original irritation, or from some other superadded. For practical purposes they may be classified as arising from (1) extension of the original process; (2) secondary infection, especially sepsis; (3) healing, partial or complete—that is, where resolution or perfect healing has not occurred; cure usually takes place by fibrous tissue development, the commonest example of which is a scar.

Self-suggested by this consideration of irritation in its relation to the composite tissues, the general principles of treatment obtrude themselves; they are: (1) Remove the cause; (2) combat the effects; (3) assist the reaction; and (4) prevent complications. Should, however, complications have already arisen, it will be necessary to deal with them.

In our application of these principles we closely follow the indications given us by Nature in her healing efforts, and the subject of "natural cures" is overflowing with interest and instruction for the inquirer. I cannot hope to deal completely with this aspect of disease, but regarding it, as I do, to be the foundation on which we build, I must consider it in some measure.

* Being the inaugural address for the new Chair of Surgery in the University of Capetown, South Africa. Delivered August 24th, 1920.

Natural Cure.

By "natural cure" one understands the active attempts of Nature to overcome disease, and whatever reaction takes place is, in essence, beneficial to the organism as a whole and curative locally. We meet with all degrees in what is actually attained in this natural curative process. Thus the result may be entirely constructive both locally and generally, which is, of course, the best that can possibly be obtained. Locally, however, the cure may involve some destruction of tissue, while, from the general body outlook, the process is constructive. Again, the local result may be in the main constructive, but nevertheless produce impairment or destruction of the general body function. Finally, the result obtained may be in great part or wholly destructive both locally and generally, leading, at the best, to a state of chronic invalidism.

It is obvious that the result depends on the efficiency of the natural reaction and the nature of the pathological condition to be dealt with, and that, while Nature's intentions are always of the very best, the curative process is often imperfect, and her attainment frequently falls short of her aim. In spite of the fact, therefore, that it may appear to be presumptuous to think of improving on Nature, nevertheless this imperfection on her part is one of the strongest pleas for surgical interference, and, while she is generally looked upon as a good physician, she frequently stands self-condemned as a bad surgeon. However, I shall endeavour to show, in some measure, to what degree we are indebted to her for indications in treatment.

Acute inflammation is the commonest natural curative process met with, and is therefore that to which we naturally turn. It represents the reaction of the tissues to irritation, and though the cause of it may be any irritant, the infective type is most frequently found, usually the pyogenic micro-organisms. The inflammatory reaction presents both general and local manifestations, the general comprising inflammatory fever, and the local giving rise to a series of symptoms and signs which have been familiar to clinicians for centuries, and consisting of redness, swelling, heat and pain, and impaired or arrested function. They are due to the local increase of vascularity and the exudation of fluid.

A. General Reaction: Inflammatory Fever.

Clinically, the chief features of inflammatory fever are:

1. *Impairment of all the organic functions*, muscular, nervous, secretory and excretory, giving rise to prostration, indigestion, loss of appetite, constipation, diminished excretion of urine, and hot, dry skin.
2. *Excessive Evaporation from the Skin*.—This results from the raised temperature, and leads to great thirst.

Pathologically, the essential features are:

1. *Increased metabolism*, with the formation of specific antibacterial and antitoxic substances.
2. *Leucocytosis*, which is not constant, but present in the commoner infections, and of great value for defensive and offensive purposes.

B. Local Reaction.

Clinically, the most important features are:

1. *Impaired function*, with restricted local activity. This is due chiefly to pain, but may also depend on mechanical effects the result of exudate.
2. *Pain*. This may present any degree of severity, is due to increased tension in the affected part, and is of chief importance as being mainly instrumental in controlling the local activities.

Pathologically, the most important features depend upon:

1. *The increased vascularity and local cellular activity*; and
2. *The modes of removal of the products of the process.*

1. This includes the whole of the actual local reaction.

(a) *Leucocytes* are greatly increased in numbers, with the result that phagocytosis is marked, and specific antibacterial and antitoxic bodies are produced.

(b) *Fluid exudation* takes place in greater or less amount, and represents a mechanism for diluting the toxins, and even washing out of an open wound both the organisms and their products, and also for bringing into contact with the organisms a greater amount of the antibacterial substances present in the blood.

(c) *Increased cellular activity* is of very great importance, and has for its objects: (1) Phagocytosis, both by the leucocytes and the endothelial cells of the part; (2) extracellular antibacterial action; and (3) repair of the damage to the part.

2. This comprises the results of the local reaction—that is to say, the terminations of inflammation, which are resolution, fibrosis, partial and total destruction, and are controlled by the degree of interference with the vascular supply.

(a) When *resolution* occurs, the causal agent has been successfully dealt with and the whole of the products of the local disturbance have been removed by the lymphatics or blood stream. Repair is perfect, and the affected tissue presents ultimately no difference from the normal. When resolution does not occur, then one of the remaining terminations of inflammation necessarily results.

(b) By *fibrosis* the focus may be completely delimited, and, though the causal factor may not be entirely destroyed, it may be rendered innocuous by encapsulation. In such cases, therefore, the products of the process may not be entirely eliminated.

(c) and (d) In *partial and total destruction* there is an attempt to get rid of a more severe infection, not by destroying it and absorbing the products as above, but by casting off the affected tissue with the infecting organisms present in it. It is employed because milder measures have been judged insufficient. In partial destruction this is brought about by a molecular or particulate destruction, such as is seen in ulceration, caries, and abscess formation. In the latter case, once pus has formed, there is a general tendency for it to track along the line of least resistance towards the surface, where an opening is established and its discharge effected. In total destruction, on the other hand, the process is one of molar or massive destruction, such as is seen in gangrene and necrosis. In this event, a large mass of tissue is separated at one time.

TREATMENT.

Following the lead given by Nature as detailed above, the treatment indicated in such an infection, where the tissue reaction is inflammatory, is as follows:

A. General Treatment.

1. *The impairment of all the organic functions*, whereby they are suspended in greater or less degree, as shown by the prostration, inability to digest food, etc., indicates prescribing *rest* to all the body activities, whether physical or chemical. (a) Physical rest is best attained by confining the patient to bed in the recumbent posture, which attitude he usually adopts naturally. (b) Seeing that the secretory and excretory functions are essential to life, and must therefore be continued, the body is best served and they obtain the greatest relief by rendering them as far as possible passive—that is to say, a maximum of efficiency is aimed at with a minimum of expenditure of energy. This is obtained as follows:

The digestive impairment is best aided by the administration of a stimulating, easily assimilated fluid diet.

The intestinal impairment is controlled by saline purges.

The renal impairment is assisted by the administration of quantities of bland fluids.

The skin activities are helped by hot bathing, and the lungs are assisted in their function by allowing the patient all the fresh air possible.

2. *The excessive loss of fluid from the skin* leads to the great thirst which indicates the administration of quantities of fluid. According to circumstances, this may be given by the mouth, by the rectum, subcutaneously or intravenously.

3. *The increased metabolism* and the formation of antibacterial and antitoxic substances gives the lead for the administration of (a) antibacterial and antitoxic serums, preferably monotypical; (b) vaccines, preferably autogenous; and also (c) chemical substances, which may or may not be specific—for example, salvarsan, emetine, the numerous antiseptics, etc.

4. *The presence of leucocytosis* has been imitated by the administration or injection of such substances as quinine or turpentine, with beneficial effects.

It is important to keep in mind that where the fever is excessive it may have a pernicious effect on the individual, and in such a case must be controlled, for example, by cold sponges or antipyretics.

B. Local Treatment.

1. *The impaired function*, with restricted local activity, suggests local rest or immobilization, which is obtained by a variety of fixation apparatus, or splints if necessary.

2. *Pain* may be relieved by elevation of the affected part, indicated by the fact that increase of pain usually follows the dependent position, and the patient himself commonly keeps the part raised.

3. *The increased vascularity and local cellular activity*, which represent the natural reaction, suggest that treatment should take the line of increasing or assisting this reaction, and this may be done by (a) the application of moist heat—that is, by fomentations or poultices—or (b) by the so-called Bier's passive congestion, by means of an elastic bandage or some form of cupping-glass. The elastic bandage also relieves the pain, and this form of treatment is frequently seen naturally, when a patient with an inflamed finger grips or ties something round the base of that finger to relieve the pain in it.

4. *The natural modes of removal of the products of the process* give several suggestions as to treatment, used chiefly as aids to the natural methods of removal, but sometimes forestalling them.

In *resolution*, where the absorption of the products by the lymphatics and blood stream takes place, this is aided by elevation of the part, which assists drainage.

Fibrosis, with the resulting encapsulation or delimitation of the focus of disease, is not imitated in the treatment of these septic infections, but is quite frequently employed in malignant disease, where, by means of x rays, radium or electricity, the development of fibrous tissue is aimed at, with a view to limiting the spread or strangling the elements of the disease.

In *partial destruction* a further effort on Nature's part has been seen—namely, to get rid of the disease by a process of ulceration or the formation of an abscess and its subsequent discharge. These suggest two very common surgical procedures, incision and scraping.

Incision mimics the bursting of an abscess, and is usually employed to forestall it. It allows of external drainage of pus or other products instead of their removal by the lymph and blood streams, and thereby relieves the system of a considerable quantity of toxic material. It is also employed to relieve tension, and consequently pain, and so diminish the dangers arising from vascular interference. This, however, is not comparable to the other indications for it, as it represents one of those cases in which the surgeon is called in to correct an error of judgement of Nature.

Scraping imitates the process of ulceration, and is frequently employed to assist in getting rid of such material as Nature is already occupied in removing. It is more commonly employed in chronic conditions rather than in acute ones.

Finally, *total destruction*, or the casting off of a focus of disease in bulk, as seen in gangrene or necrosis, suggests the removal of such a focus of disease by excision or, in the case of the limbs, by amputation.

We have here, then, an example of the complete analogy between Nature's line of treatment and that adopted by the surgeon, which may be described as good and sound.

Arising from a consideration of the above facts, several important and interesting points suggest themselves. The

first is that we are here dealing with an ideal case—that is, one in which the etiology, pathology, diagnosis, and prognosis are completely known and understood, and the treatment, as indicated by Nature, follows automatically. The second is that Nature herself employs, and indicates the employment of, what we may call both "medical" and "surgical" measures—that is, those to which non-operative and operative procedures are analogous. Thirdly, no doubt is possible as to the position allocated to the natural "operative" measures. They come as a last resort, after all other means have failed, and tissue, representing a focus of disease, is only cast off because it is impossible to save it.

The first of these points opens up the whole subject of the relationship of the science to the art of surgery, or, to put it in another way, the question of surgical judgement and its relation to treatment, especially operative.

Good judgement depends on an intimate knowledge of disease in all its aspects, its causation, its development, the natural reaction to it, and the final results which accrue. The better this knowledge the better the judgement is likely to be. It involves the questions of diagnosis and prognosis, and on these the line of treatment to be advocated follows of necessity. If a choice were to be made between a surgeon of superior judgement and one who was only a good operator, the balance would be very markedly in favour of the former. In the absence of good judgement, therefore, with its entailed good diagnosis and prognosis, good treatment cannot be systematically carried out. Good diagnosis carries with it a clear knowledge of the pathological process present and the various means of treatment available, whereas good prognosis, with a perfect understanding of the eventualities, leads to the selection of the best line of treatment for the particular case in question.

The importance of diagnosis cannot be exaggerated, and while in many cases it is obvious, in some it is quite the reverse, and in these every possible means ought to be employed to allow of its elucidation before treatment is adopted. Dr. William Mayo has said, "You cannot always make a diagnosis, but it's a mighty good thing to try," and this is the attitude which a good surgeon will adopt. One must acknowledge, therefore, that a diagnosis is not always possible, and an operation of an exploratory nature may be necessary to dispel doubts and allow of one being made. Further, the diagnosis is sometimes wrong, indeed the correct one is not always the best (according to the various symptoms and signs present), which anomaly is to a great extent explained by the fact that the human being is not a system of rigid tubes and blocks of inert material, such as a plumber has to deal with, and the personal factor often plays a large, and perhaps misleading, part in the investigation of disease. However, the better the surgeon from the point of view of judgement, the fewer will be the cases in which absence or error of diagnosis will occur, and the fewer will be the corresponding exploratory operations. One need hardly say that the only man who never makes a mistake in diagnosis is he who never makes a diagnosis at all.

Good prognosis depends upon a sound knowledge of pathology and a wide experience of cases, and from a practical point of view its chief bearing on treatment depends upon the assessing of the probabilities of the success or failure of the natural and non-operative or "medical" measures. Should judgement be given against the likelihood of their success, then, if cure is to be obtained, the advocacy of operation follows as a matter of course. In such an event the earlier it is done the better, and so in these cases operative treatment will usually forestall and often completely replace any other.

It has already been pointed out that Nature, in dealing with disease, employs both non-operative and operative measures, and that the latter are only used as a last resort, when the former have failed. But operation, in surgical treatment, occupies the same relative position as in Nature's treatment—that is, it is a last resort, with the reservation, already made above, that, where judgement foreshadows the failure of other measures, such a failure is not waited for, but operation is advised and performed as early as possible. The indications for operative interference may thus be reduced to two—namely, (1) failure of the natural cure, and (2) failure to cure by medical means. It is therefore a truism to say that the degree of success attending surgical operation in disease is the gauge

of the limitation and failure of medicine in its treatment. Hence, from the operator's point of view, true advance in the surgical treatment of disease must lead to what may be best described as "surgical suicide," seeing that, as specific therapy and preventive medicine in one or other form progress, the necessity for operative interference must steadily diminish until finally one sees it limited to the treatment of accidental injuries and mechanical defects.

In an ideal scheme, then, for the treatment of disease, operative measures have no place, and the best surgery is that which approaches most closely to the ideal. Unfortunately, the present imperfect state of our knowledge of disease, and our consequent limitations so far as ideal treatment is concerned, leave open a wide field in which operative interference offers the best hope of cure to the patient. However, this interference is minimized by the surgeon of good judgement as unnecessary, and futile operations will be avoided. The failure of the natural and medical means of treatment has been postulated as the indication for operative interference, and it is just here where good judgement appears at its best. For whether or not operative measures will be necessary, what they shall be if they should be called for, and when the most opportune time will be for utilizing them, are questions which depend entirely on the adjudged efficiency or futility of the non-operative treatment.

Should operative interference be considered advisable or necessary, the next question to be settled is, "What is the operation to be?" There can be no diversity of opinion that the best operation is that which offers the maximum of benefit with the minimum of interference, so that if some simple and conservative procedure be efficient to deal with the condition present, it is bad surgery to employ a complicated and destructive one; and, generally speaking, one might add that the efficiency varies directly as the simplicity, or inversely as the complexity, of the technique. The carrying out of such a principle, too, militates against the indiscriminate, casual, and unnecessary removal of tissue which might easily be preserved, often with benefit to the patient; this is strongly indicated by Nature, for it has already been pointed out that she casts off tissue only because she is unable to conserve it. The settling of this question also depends on good surgical judgement.

Bad judgement, then, which is due to ignorance of the normal and diseased states of the individual, and on lack of the power of correlation and deduction, is responsible for bad surgery, of which we have evidence in three main issues: (1) The withholding of operations which are necessary or advisable; (2) the performance of unnecessary and superfluous operations; and (3) the performance of inefficient, imperfect, or wrongly chosen operations.

The withholding of necessary or advisable operations is quite as much a mark of bad surgery as excessive operating, the performing of operations which are unsuited for the condition present, or of those which are not thorough or are technically wrong. No doubt one of the chief causes of unnecessary and meddlesome operative interference is the comparative ease and safety with which the ordinary operations of surgery may be embarked upon, granted an averagely good aseptic or antiseptic technique. The results of such bad surgery are not always obvious, thanks to the intervention of one or more of several agencies, and in this respect the *vis medicatrix naturae* plays a prominent part. It is invariably of the greatest assistance to good and is often the salvation of bad surgery.

In counteracting, and so covering up, the results of bad surgery, one example of Nature's for sight is the provision of a reserve, both physical and functional, by which the removal of a limited amount of tissue or the interference with function to a certain degree may be borne without any deleterious result. Where more than constitutes the reserve is put out of action, Nature's compensatory mechanism, involving the hypertrophy and increased function of what remains, may soon adjust the deficiency.

Where the local compensatory mechanism is unable to deal with the situation, one sees Nature quite often employing collateral or associated means of overcoming it. Finally, there is still the whole of the natural reaction to irritants and their effects which has been outlined above, and which is so important in dealing with what injury and infection there may arise.

Acknowledging, therefore, the wonderful compensatory, accommodating, and reconstructive power of Nature, all that may be needed to complete her concealment of bad work is that she be allowed to perform her task *in camera*, and this is readily provided for by means of the closed wound. It might be said without fear of contradiction that "the closed abdomen covers a multitude of sins."

INDICATIONS FOR OPERATION.

The general principles of treatment have already been mentioned, and are: (1) Remove the cause; (2) combat the effects; (3) assist the reaction; and (4) prevent complications. The indications for operative interference have been reduced to two—namely, failure of the natural or of medical means of cure. It therefore follows that whenever in any of the principles of treatment enumerated the natural or medical means fail, operative interference may be advisable or necessary. As a practical interpretation of this, by taking the principles *seriatim*, the chief indications for operation are as follows:

1. *Remove the Cause.*—The chief requiring surgical removal are *foreign bodies*, especially septic ones. Micro-organisms may occasionally be removed by mechanical and chemical means, but usually their removal necessitates the simultaneous removal of the tissue they are present in, and the procedure does not therefore come into this category.

2. *Combat the Effects.*—The common indications for interference here are to (1) arrest haemorrhage; (2) close a wound; and (3) restore function—for example, plating a fracture, suturing a nerve, etc.

3. *Assist the Reaction.*—Here, as a last resort where non-operative measures had failed, operative interference has been shown to be indicated, by (1) incision, to allow of external drainage; and (2) scraping, excision, or amputation, in order to remove a focus of disease.

4. *Prevent Complications.*—These arise from (a) extension—for example, fractured ends of bone pressing on nerves, vessels, etc., or conditions requiring ligation of a vein proximally, to prevent discharge of emboli into the circulation; (b) secondary infection, especially sepsis—for example, in a compound fracture, psoas abscess, etc.; (c) healing—for example, from fibrous tissue formation and its contraction, the mechanical effects of excessive callus formation, etc.

Mention has been made of operative interference being indicated for diagnostic purposes; it may be quite a valid proceeding, but it should be reduced to a minimum. This has perhaps a special bearing in a country such as South Africa, where cases are treated at great distances and medical aid is difficult to obtain. In such cases, where the means for detailed diagnosis are not available and doubts exist, the balance is greatly in favour of operating, as much the safer course. This bears out the generally recognized claim that, as far as possible, all cases should be treated in a properly equipped hospital, where complete investigation can be made, and where the patient has the best chance of being cured by other than operative means.

Much might have been said, in considering such a subject, on the advantages to be gained from a careful choice of anaesthetic, the employment of measures against shock, and the technique of operating, etc., but these would have required too much time, and have purposely been omitted.

What I hope to have been able to show, then, is that operation is not synonymous with surgery, that it is not the primary object of surgery, and that it is not even the first pillar of treatment on which the surgeon leans for support. On the other hand, with few exceptions, operative interference is employed because of the failure, or probability of failure, of other means of cure, whether of those utilized by Nature or of those non-operative measures which are commonly included under the term "medical treatment." Seeing, therefore, that the foundation on which operative treatment rests is constituted by the shortcomings of Nature and of medicine, true advance in the treatment of disease must lead to the progressive diminution in the number of operations and the gradual disappearance of the operating surgeon, except in such conditions as accidental injuries and mechanical defects. Under such conditions medicine must temporarily find an increasing sphere of activity and importance, thanks

almost entirely to the investigations of the laboratory worker; but as preventive medicine progresses towards the ideal, the physician, too, as accepted at present, must lose his material in an increasing degree and tend to disappear.

Pending the realization of this visionary ideal, however, the burden of our present imperfections has to be borne, and a very prominent part in the treatment of disease must continue to be played by surgery, the basis of which consists of:

1. *Good judgement*, with all it involves—of paramount importance; and, depending on this—
2. *Rational treatment*, non-operative or operative, as already described.

When operative measures are indicated, then the outstanding features of good work are:

- (a) *Conservatism consistent with efficiency*;
- (b) *Simplicity of technique*; and
- (c) *Operative skill*, which includes gentleness, manipulative dexterity, and careful speed.

EIGHTY-EIGHTH ANNUAL MEETING
OF THE
British Medical Association.

Held at Cambridge, June 30th to July 2nd.

PROCEEDINGS OF SECTIONS.

SECTION OF PATHOLOGY AND
BACTERIOLOGY.

Professor J. LORRAIN SMITH, M.D., F.R.S., President.

DISCUSSION ON
THE PRESENT POSITION OF CANCER
RESEARCH.

OPENING PAPER

BY

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CANCER research, the knight-errantry of medicine, presents "a restless complication of bold hazards and miserable disappointments." Formal tournaments and solitary encounters are the portion of its devotees to an extent unusual in other branches of scientific medicine, nor are the strong enchantments of its extinct prototype without their parallel. Strange remedies, potent as the balsam of Fierabras and as capricious, play their part and disappear. The medical and lay public contemplate with bored impatience the enigmatical actions of the combatants who, if they have their feet on solid earth, seem to have their heads in the clouds. Not a little of this want of comprehension is due to the conviction, almost universal among laymen and not unknown in the ranks of medicine, that knowing how to spell the word they know what cancer is. A natural impatience is felt, and sometimes expressed, at the apparently fictitious difficulties of definition which beset the investigator.

Two examples of these differences may be cited. In the first, in my opinion, the lay impatience is largely justified; in the second, not. In the first place, then, the nomenclature and classification of tumours seem to the outsider an unnecessary refinement absorbing far too much space in the publications on cancer. The excessively detailed systems of classification of tumours which have been proposed from time to time have no analogy with the natural classifications of animals and plants but are merely convenient aids to memory. This is at once seen to be so if we reflect that the new growths of men and animals are really new formations arising afresh from the non-neoplastic elements of the organism attacked. The basis of a natural classification—community of descent—is therefore absent, so that it is only metaphorically that it

can be said that one tumour-form is derived from another. The derivation is from the normal mother tissues, but even a histogenetic classification, if too rigid, may be misleading. The human importance and the intellectual fascination of the subject compel the detailed analysis of all the cognate material, but the systems of nomenclature and classification can only be judged by their concise descriptiveness and convenience.

The second example of difference of standpoint is seen in the attitude of the research worker to reports in the lay and medical press of the cure of cancer. His first scrutiny is directed to the evidence that the patient really was the subject of cancer, and there must be few of any experience whose inquisitiveness in this direction has not been regarded as impertinent. Clinical history, the opinion of the medical attendants, and the report of an experienced pathologist when available, must all be passed in review. One desires to examine afresh the histological preparations if these can be had. If, as sometimes happens, doubt is thrown on the histological diagnosis, this is taken as an aspersion on the competence of the pathologist making the report, or as a disingenuous attempt to discredit a great discovery. It is neither. The standard by which a tumour-like new formation is judged must be different in the two cases. A pathologist to whom a specimen from an exploratory or primary operation is submitted must weight the evidence to the side demanded by the patient's interest. It is obviously, for the patient, less dangerous to recommend that a growth of doubtful malignancy be treated as cancerous than to take a chance on the portions not examined being more innocent than those which have been seen. Let us suppose the patient has been freed from his disease. The pathologist's opinion of the sections has now little interest for the patient, but may be critical for the welfare of thousands of sufferers. He must now weight the scales against the malignancy of the specimen and demand the most stringent proof. Reasonably satisfied in this preliminary inquiry, it is then proper to consider the evidence that a cure has been effected. When stated in this way this line of argument will probably appear quite reasonable, but it has been found singularly unsatisfying to the impatience of those who believe themselves on the track of a specific for cancer.

Considerations of the same kind are similarly in place when claims are made to have effected a cure of a propagated tumour in experimental animals. In fact, it is fairly strong evidence of the close parallelism of the transplantable tumours to naturally occurring cancer that none of the numerous claims to a successful specific therapy of them has been substantiated.

The experiments now being carried out by many workers on the production of cancer, call for a discussion of the criteria which ought to be exacted in work of this kind, before accepting the new formations produced as truly cancerous. It is as well to recognize at the outset that the definitions of cancer are still essentially clinical. Their progressive character is the most constant and abiding characteristic of the malignant new formations. Local infiltration, metastasis formation, and recurrence, are, to a large extent, dependent on local conditions which may easily be incompatible with the conditions of the experiments. Successful transplantation to normal animals of the same species is more and more being invoked as the only valid proof of malignancy, and this condition was accepted and fulfilled by the late Dr. Clunet in his classical experiments on the production of sarcoma in rats after severe x-ray dermatitis. This condition is probably too exacting, as there are now many instances on record in which new growths in mice have failed to grow in normal animals, even when hundreds have been inoculated. Artificial metastasis by autologous grafting in the primarily affected animal is in my opinion a more just test. It has also the advantage that it not only does not exclude transplantation to normal animals but makes it possible in many cases in which ulceration and infection of the greater part of the primary growth almost preclude success.

The necessity for secondary confirmatory experiments of some kind is well shown by a remark in Yamagiwa and Ischikawa's valuable monograph on epithelial tumours produced in the rabbit's ear by painting with tar. The authors record their astonishment that some of the tumours disappeared when the irritation of tar-painting was interrupted! The absence of evidence of this sort detracts from the value of Lazarus-Barlow's observations on the