LECTURES ON THE ELEMENTS OR FIRST PRINCIPLES OF SURGERY

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BY

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Certainly it is excellent discipline for an author to feel that he must say all that he has to say in the fewest possible words, or his reader is sure to skip them; and in the plainest possible words, or his reader will certainly misunderstand them. Generally, also, a downright fact may be told in a plain way; and we want downright facts at present more than anything else.—RUSKIN.

Original Communications.

THE ELEMENTS OF SURGERY.*

BY JOHN CHIENE, M. D., F. R. C. S. E.

Surgeon to the Edinburgh Royal Infirmary, etc., etc.

LECTURE I.—THE STUDY OF PRINCIPLES—HEALTH AND DISEASE—ACTION OF AN IRRITANT—THE PHYSIOLOGY OF AN INJURED PART—THE BLOOD-BLOOD VESSELS AND TISSUES—THE FORMATION OF INFLAMMATORY LYMPH—THE PROCESS OF REPAIR—HEMORRHAGE—THE REPAIR OF A WOUNDED VESSEL, AND REPAIR IN THE TISSUES GENERALLY, BY BLOOD CLOT.

Introduction.—Among the many advances made in surgical practice during the present century, no two agents have come to play so extensive a part as anæsthetics and antiseptics. By the first pain is abolished; by the second putrefaction is prevented. Surgeons are of one mind as to the benefits and advantages of anesthesia, but they are not agreed as to which anesthetic is in all respects the best. There is far greater diversity of opinion, however, as to the value and capabilities and uses of antiseptics. Many surgeons seem unwilling to believe that putrefaction is preventible; others assert that the

* The several lectures in this series are an abstract of certain lectures delivered by me on Systematic Surgery in 1878, and asked for by Dr. Yandell. Much that I say is already known, and has been better said before. Many points which it was proper to dwell upon in the class-room are omitted here. If certain portions which remain be thought too elementary for this place, I

methods in use for this end are not effective, others again that the means are not adapted to every day work, while yet another class regards the dangers arising from putrefaction as of too little moment to demand such an amount of care and trouble to avert them. Having been for some years associated with Mr. Lister in this hospital, and privileged to observe his practice and not infrequently to be intrusted with his wards when he was absent from Edinburgh, I have had abundant opportunity of studying and putting to practical test the doctrines of which he is the exponent. The conclusions which have forced themselves upon my mind are that putrefaction in wounds is, as Mr. Lister asserts, the result of deposit in them of living organisms, the germs of which are present in the air and water; that in consequence of the presence of these organisms certain products are formed, which act locally as irritants and prevent healing of the wound, and which, if absorbed, give rise to constitutional and local symptoms; that these in turn will vary in intensity in different individuals, the differences depending upon, first, the variety of the putrefactive poison, second, its amount, third, the constitution of the patient. As in agriculture, so in surgery, the yield per acre

trust the excuse for their appearance will be found in the fact that they are, in my opinion, necessary for the proper elucidation of the subject.

The authorities to which frequent reference will be made are,—first, John Hunter's Works, edited by Palmer. Second—Anatomical and Pathological Observations, by John and Harry Goodsir, Edinburgh, 1845. Third—Paget's Pathology, edited by Turner. Fourth—Virchow's Cellular Pathology. Fifth—Foster's Physiology. Sixth—Billroth's Surgery. Seventh—Burdon Sanderson on Inflammation, in Holmes's System of Surgery. Eighth—Druitt's article on Inflammation, in Cooper's Surgical Dictionary. Ninth—On the Coagulation of the Blood (Lister), Proc. Royal Society, 1863. Tenth—Contributions to Physiology and Pathology (Lister), Philosophical Transactions for 1858. Eleventh—Chirurgie Antiseptique, by Lucas-Championnire, Baillière, 1876. In this work references will be found to Lister's papers on Antiseptic Surgery in the Lancet, 1867, 1869; and in the British Medical Journal, October, 1868. Twelfth—Contributions to the Germ Theory of Putrefaction by Lister, in the Transactions of the Royal Society of Edinburgh, Vol. XXVII, and in Microscopical Journal, October, 1873.

My thanks are especially due to Mr. A. M. Stalker, M. A., for the care and intelligence with which he has transcribed these lectures from notes taken while they were being delivered.

is governed by the variety and amount of seed sown, and the soil in which it is sown. The organisms are the seed, and vary as the different varieties of the cereals vary among themselves. The tissues are the soil, and vary in their vitality—in their "power of resistance," as John Hunter termed it—as sand, loam, gravel and clay vary.

Lister, to my mind, has clearly shown that an active faith in the germ theory of putrefaction, as taught by Pasteur, will enable surgeons to work with far better chances of success than is otherwise possible; and that by the adoption of certain methods and use of certain substances termed antiseptics, putrefaction can be absolutely prevented. If these doctrines be, as I believe, founded in truth, their final acceptance is but a matter of time. The methods by which the desired end is now reached may, and doubtless will, be changed greatly and in many ways; for it would ill become one to say that the simplest and best modes of reducing these principles to practice had yet been attained, and that future study and future labor would yield no further improvements. But of one thing I am persuaded, and that is that we owe to Pasteur and Lister, a very great addition to the means at our command for prolonging life and preventing suffering, which I need hardly add are the legitimate aims of all true surgery.

The antiseptic or Lister's system owes much to its opponents—more, perhaps, than to its friends. It is safe to say that had not its every part been challenged, its every advance rigorously criticised, it would hardly occupy the place which it does to-day. In science, as in literature and in politics, fair and searching criticism exposes error and advances truth. Certainly no doctrine in all surgery has been more mercilessly handled or contemptuously treated, more sneered or laughed at, than this of Lister's. But with truth and logical scientific deduction as its foundation, the waves of opposition which beat against it fortunately serve to show a weak point in its structure of minor importance, here and there, while the solidity of the principle on which it rests remains conspicuously undisturbed.

When seen from Lister's point of view, the elements of surgery on which the practice rests are, in a certain sense, changed. Where the principles are founded in truth, they of course, remain unaltered; but where errors obtained, a better light has enabled us at least to detect their presence; and while we still continue ignorant on many points, the consciousness of that ignorance is clearly a step towards its ultimate removal. Numerous difficulties have already been cleared up, knowledge has taken the place of obscurity, and complexity has yielded to simplicity. Much yet remains to be done.

I wish here to state that while I know no words in which to express what I owe to the teaching and example of Mr. Lister, yet I alone am responsible for the statements I may make in these lectures—statements which I ask may be regarded as simply the expression of opinions formed during my labors in the Edinburgh Royal Infirmary, which begun as house surgeon under Syme, were continued as assistant surgeon to Mr. Spence and Mr. Lister.

The Study of Principles.—The derivation of the term surgery, or chirurgery, indicates very clearly that at one time it was looked upon as a "handiwork;" and those diseases in which manual means were used to obtain a cure were placed under the charge of chirurgeons or surgeons. But from being merely a practical art, surgery has developed greatly in modern times, so that we have now the two well marked divisions of *principles* and *practice.* In this course of lectures I shall speak of the Principles of Surgery; and it is not intended to treat of the Practice, except as illustrative of the main subject. Let me demonstrate what I mean. In the application of a splint to a fractured limb, the principle is that we should command the break above and below the seat of fracture; and from this arise many variations in the methods adopted and in the materials employed. Wood, pasteboard, pillows, etc., are used according to the necessities of each case. Again, the principles of bandaging are to put the bandage on so that it won't

come off, and to make the pressure equable. Different means and materials attain this end in different parts of the body. A third example is the importance of rest and the avoidance of unrest. In the healing of a wound the parts must be kept quiet, and the materials employed for making the stitches must be chosen according to their fitness for this purpose. It can not be right that you should apply indifferently a flexible silk stitch and a rigid silver stitch; or that the stitches may, as you please, be either few and far between, where each has a large area to keep at rest, or many where each has an easy task to perform. The means adopted for securing rest for the various organs of the body when diseased are, in practice, as various as their functions. The eye is kept at rest by confining the patient in a dark room; the brain, by prohibiting reading and thinking as much as possible; the kidney, by employing other organs of the body to perform their functions, such as the skin by the use of diaphoretics; and so forth.

But while we must always bear in mind that we speak here of Principles chiefly, it must be remembered that it is not always possible to refer to Principles. In many cases we can only be empiricists; and it is well that it should be so. This only means that our knowledge has its limits, and that there are still principles to be discovered, and truths to be learned; and in surgery, as in everything else, that part of the science where the search for truth is still going on, and our ignorance is most manifest, possesses the greatest charm for the inquirer. I shall always take the opportunity of pointing out the gaps in our knowledge, which remain to be filled up by future investigators.

Health and Disease.—The subject which surgery has for consideration is disease; and without spending time in considering disease from a surgical, as distinguished from a medical, point of view, let us merely ask the question, what is disease? The simplest reply is, a departure from health. This brings forward the question, what is health?—and to answer it, I shall make use of a figurative mode of explanation.