tion to the best mode of operating upon varicose veins, no method should have been adopted by them for effectually closing the vessels during and after the operation. As in former times, the actual cautery was used for the purpose of arresting hæmorrhage, so are there still in modern surgery those who prefer the actual cautery, or some form of caustic, in preference to the simple mode of closing a vein which I have described at the commencement of this lecture. There has very recently been in this hospital a young woman who had had, I believe, upwards of a dozen sloughs made on her leg by the actual cautery; and in a recent number of the *Lancet* the same mode of treatment is advocated by a distinguished surgeon attached to one of our metropolitan hospitals.

Sir Benjamin Brodie, some years ago, applied the caustic potash over clusters of smaller veins in order to produce their obliteration; and Mr. Mayo subsequently adopted the same treatment for varicose veins of a larger size. Sir Benjamin Brodie has left us the result of his experience in the following words: "The application was very painful; the slough took a long time to separate, and the sore took a long time to heal."

[To be continued.]

Lectures

ON

CERTAIN MUTUAL RELATIONS OF PHYSIOLOGY, PATHOLOGY, AND THE PRACTICE OF MEDICINE.

BY

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LECTURE II.

Pathology in its Relations to the Practice of Medicine. On certain Pathological States as the Result of Impaired Nutrition consequent on the Imperfect Performance of Function. Diseases of Degeneration attacking the Heart, Lungs, etc. Fatty Disease of the Heart. Sudden Death in Relation to Diseases of the Heart. Emphysema of the Lungs, Phthisis, etc.

MR. PRESIDENT AND GENTLEMEN,—In a former lecture, I pointed out certain physiological principles; and I endeavoured to show their relations to pathology and the practice of medicine. I propose, in the present lecture, to confine my remarks, for the most part, to questions of pathology. As every physiological or healthy process goes on in the elementary particles of the body, so with every morbid action; and just as it is essential to the physiologist who would appreciate aright the function of any individual organ, that he should be acquainted with the minute structure of that organ, so is it alike essential to the pathologist that he should estimate the very earliest changes which diseased action produces, if he would form a correct view of the nature of that action. It is not simply necessary that he should be acquainted with the changes of structure effected by a disease when fully established, but tracking, as it were, the disease backwards, he should endeavour to seize upon

its earliest manifestations. It is thus that he will be led not only to a knowledge of the morbid anatomy of the disease, but to a correct appreciation of its pathology.

It is of great importance that we should have fully before our minds the object for which we study diseased structure; viz., that we may gain an insight into the nature of the morbid process which has given rise to it; for I think it may be fairly open to remark, that the profound and somewhat exclusive study of morbid anatomy, which characterised certain schools of medicine some years ago, led to an evil in reference to therapeutics which is perhaps only just passing away. In the examination of an organ, as it presented itself after death, the mere morbid anatomist was perhaps too apt to look upon the results of the disease as the disease itself; and the hepatised lung, the ulcerated intestine, or the prominent lesion of the disease, may have obscured his regard as to the constitutional condition, of which the local affection was only a manifestation. This may, perhaps, have caused him to direct his attention, in the treatment of such cases, too exclusively to the implicated organ, to the neglect of the general symptoms. I think it possible also that the refinement of diagnosis, which auscultation and chemical manipulation have enabled us to arrive at, may have had, with some, an influence in a similar direction. If, however, this error did exist, and if it led to a wrong application of therapeutics, I think the physicians of this country are as little open to the reproach as any; and that, at all events at the present day, no contracted views of the nature of disease regulate our practice, or direct the application of our remedial measures.

But let me be quite understood in this respect. Do I make these remarks with the view of disparaging the efforts of the physician in the direction of accurate diagnosis, or of the morbid anatomist in his search after the changes of structure which disease produces? Far from it; for all our hopes of advancing the science of medicine rest on our prospects of still further improving our means of detecting disease, and of being able to appreciate the exact nature of those pathological processes by which disease is produced.

We cannot, I think, expect that we shall ever discover for each specific disease a specific remedy; I mean a remedy as specific as that with which we can cure a neuralgia, or an ague. It may be that other diseases will admit of an absolute and definite cure by the agency of some single remedy; but the majority of diseases will probably always have to be met and relieved by treatment, and will never admit of cure.

It is, therefore, in the great mass of diseases, that a knowledge of the nature of those pathological processes from which they result is of so great importance. We may care little, and our patients may care less, what is the exact pathological process which produces a tertian ague, provided we can, by the administration of a few doses of quinine, effectually cure it; and it would, perhaps, be an useless waste of time to endeavour to explain the *modus operandi* of that same agent when it effectually cuts short the torments of a *tic*; but, in the management of a disease which admits of no definite cure, every pathological element is important; every symptom, whether local or constitu-

tional, has to be carefully weighed and judged; its indications have to be considered; and from all this a treatment has to be directed.

There is probably no such thing as local disease—I mean, speaking of disease in its true significance: no affection of an organ which does not result from some deep-seated pathological cause—something affecting the entire system, and impressing itself on the individual organ which is the seat of the morbid process. And if it be so, does it not teach us to take a broad and comprehensive view of all diseased action? And does it not afford us a valuable lesson in reference to the application of therapeutic measures?

The most successful practitioners will perhaps admit that, in the treatment of disease, they are in the habit of prescribing but few remedial agents; that most affections can be referred to a few principal types—types of modified physiological action, which must be met by one general plan of treatment; that, in regard to the management of the various inflammatory affections, they can recognise in each case, whatever be the individual organ attacked, a certain constitutional state which has impressed its stamp on the local disease, and which must be met by constitutional treatment.

Nor is the recognition of this principle of the pathological condition of the body of less importance to the surgeon than to the physician. Is it not true that the smallest wound will sometimes give rise to severe constitutional symptoms? and that the most trivial local affection will occasionally resist every effort that is made for its cure, until the recognition of some constitutional taint directs us in the application of our remedial measures? Have we not seen that the most simple of all operations—that of vaccination—has been rapidly followed by phlegmonous erysipelas, which has destroyed life in the course of a few days? Cases of this kind, where the slightest scratch, the smallest puncture, or the most trivial operation, is followed by erysipelas, phlebitis, or pyæmia, indicate the previous existence of certain morbid conditions of the body, and point out to us the importance of a more profound study of the symptoms by which such conditions may be recognised. They may be of so subtle a nature as long to evade our research. Depending primarily on a vitiated state of the blood, they are necessarily difficult, nay, in some cases, perhaps, impossible of recognition, unless they give rise to some structural change. But just as certain cachectic conditions of the body—the cancerous, the scrofulous, the confirmed syphilitic—may be recognised by certain peculiarities, just as there is a physiognomy of various acute diseases, so may we hope, that a more profound study of the external demonstrations of other pathological conditions will enable us to discriminate, more easily, their characteristic features.

But, passing from questions relating to these peculiar pathological conditions, let me briefly refer to some of those pathological processes which lead more directly to structural change; and let us consider how a more careful study of them is calculated to influence beneficially our therapeutics.

There are certain diseases which we recognise as diseases of degeneration, in which the tissues of an organ undergo a real transformation—a transformation from a highly organised to a less organised substance. These diseases are, for the most part, in-

sidious in their origin, more or less chronic in their progress, and usually tend to a fatal issue, by a gradual impairment of the function of the organ which they attack.

I shall illustrate the point to which I am now directing your attention, by referring specially to two pathological conditions which partake of the nature of degeneration, attacking respectively two of the most important organs of the body; and I think it is in the more careful study of the early symptoms of these and such-like changes, and of the way in which they ensue from imperfect physiological action, that we may hope to advance the science of medicine, and extend the range of our therapeutics beyond the mere treatment of disease to the prevention of its development. And, further, it appears to me that we may learn a valuable lesson, in this respect, from a consideration of those changes which we witness as the almost constant concomitants of declining life.

It is undoubtedly true that one of the principal changes occurring in the body, and which indicates the approach of, and is more or less constantly associated with, old age, is that process of degeneration by which certain tissues become converted into fat. We know the tendency which exists in many people, as age advances, for a deposit of fat to take place, not only on the surface of the body, but also in various internal organs; and not merely this, but what is of greater importance still in a pathological point of view, the tendency of certain organs, more especially the heart and blood-vessels, to undergo fatty degeneration—for fatty matter to become deposited in the place of normal tissue. This change takes place to a considerable extent in old age, and, although not necessarily connected with it, must be looked upon as the result of the imperfect nutrition which characterises that period of life, and as the first step in that downward path which leads from life to death. This alteration of tissue is now considered essentially one of degeneration, not only because fat is mechanically useless, and of lower organisation than the tissues it replaces, but because the conditions under which it is deposited partake much of the nature of death. We find it largely, as I have said, in the tissues of the aged; and Dr. Druitt has shown that fatty degeneration of the placenta takes place towards the end of utero-gestation, at a time when the organ is becoming relatively old. We have, further, the well known fact of the conversion of dead flesh into adipocere; and, most important perhaps of all, the experimental demonstration of Dr. Quain, that if a piece of healthy muscle be placed in a jar and kept moist, without access of air, it will in a few weeks present all the appearances of fatty degeneration.

Here, then, we have evidence that, with the withdrawal of the controlling influence of life, fat replaces tissue; but we can go even further than this, and show that, during life, when the physiological action of an organ is in abeyance, the nutrition of the part is so far interfered with, that fat becomes deposited in the place of normal tissue; that, where there is an approach to that condition which is characteristic of death, there, results of a similar nature to those which follow death, take place, only to a less extent.

When a voluntary muscle—a muscle of one of the limbs—is placed in a condition of rest, it under-

goes, not simply atrophy, but fatty degeneration; and in proof of this, I mention the following fact. In April of last year, Mr. Fletcher showed at the Medical Society a knee-joint with the muscles connected with it, which joint he had removed from a patient in the Workhouse Hospital. The limb, in consequence of the joint-disease, had been fixed in one position for a considerable time. During this time, the action of the muscles of the calf had been more or less in abeyance. The gastrocnemius had all the appearance, to the naked eye, of fat. The soleus was slightly red, but in appearance somewhat fatty. I secured pieces of both muscles for microscopical examination. I found the gastrocnemius almost entirely made up of fat-globules; in fact, it was in a very advanced stage of fatty degeneration. The soleus was also fatty, but not to so great an extent as the other muscles; and this difference in the two muscles is not without its interest. The gastrocnemius, from its connections and from the flexion of the limb, was probably deprived of action altogether; whilst the soleus was still brought into play, to a certain extent, in the extension of the foot.

Now, these muscles were not dead; they were regularly supplied with blood; they were simply at rest; their physiological action was in abeyance; but yet a process went on in them by which they became converted into fat; by which their highly organised tissue was changed into one of a less complex nature, one approaching more nearly to the inorganic world, and which, instead of having a mechanical power—a power of making the limb serviceable for the purposes of active life—was utterly useless, utterly powerless; in fact, physiologically dead.

And has not a knowledge of this fact important practical bearings in reference to some of those disorders to which I have just referred? Just as the muscles of the limbs will undergo fatty degeneration, so do we know that the muscular fibres of the heart will undergo a like process; and a knowledge of the causes which give rise to the former affection, should lead us to a consideration of the means by which the latter may be averted or controlled.

All the researches which have been made into this subject of fatty degeneration, tend to show that it is the result of impaired nutrition. It is, undoubtedly, a frequent consequence of the diminished vitality, if I may use the expression, which characterises old age; but it may also result, and does very frequently result from an old age which is premature.

We know little, at present, of the question of hereditary predisposition to fatty disease; and to this point it would be well if future pathologists would direct their attention; for if we knew that a predisposition to fatty heart could be transmitted from parent to offspring, we might endeavour to anticipate the disease, to check or retard its development.

[To be continued.]

A STRONG MAN. The last lift by Dr. Windship, of America, was 2,600 lbs., which is about the weight of seventeen men of ordinary size. The strongest European we ever heard of or saw was one Becka, a porter of Mayence, who would get under a cask weighing 17 cwt. and lift it up with his back. (*American Paper.*)

Original Communications.

SOME ACCOUNT OF THE OPERATIONS PRACTISED IN THE NINETEENTH CENTURY FOR THE RELIEF OF TENSION OF THE EYEBALL, GLAUCOMA, Etc.

By JAMES VOSE SOLOMON, F.R.C.S., Surgeon to the Birmingham and Midland Eye Hospital.

[Continued from page 579 of last volume.]

Intraocular Myotomy. I entered upon a clinical investigation of the value of incision of the ciliary structures in certain diseases of the eye and disorders of the optical accommodation, on March 1st, 1860. During the first three months, I always pursued one method, which was as follows. The patient being seated, or in the recumbent posture, I entered a small Beer's cataract-knife (Sichel's) at the corneo-sclerotic union, and then pushed it through the pillars of the iris into the ciliary muscle, making an incision in the latter of about one-sixth of an inch, on a line parallel with an equator of the eye. (See Diagram.)

The employment of chloroform is not necessary; but I recommend it whenever it can be conveniently applied.

The operation should be done slowly, and the knife cautiously withdrawn, so as to avoid a sudden escape of the aqueous humour or prolapse of the iris, or the entrance of vitreous humour into the lips of the wound, which is apt to excite ciliary vascular irritation. Moreover, the more sudden the escape of the humours of the eye, the greater likelihood will there be of the occurrence of hæmorrhage from a diseased choroid or retina.

Such an incision as I have described, causes a division of some of the radial and other fibres of the ciliary muscle in a transverse direction; also of branches of the nerves which are distributed to the part from the ciliary ganglion (ciliary and third pair). It is scarcely necessary to remark, that the ciliary are vaso-motor as well as sensory nerves. And I am in-