

# British Medical Journal.

SATURDAY, JANUARY 26TH, 1861.

## CELLULAR PATHOLOGY: ITS PRESENT POSITION.\*

RESUMING this subject from the JOURNAL of January 12th, we proceed to the examination of the connective tissue theory.

The German anatomists have for some time been in the habit of calling certain fibrous tissues, and especially ligamentous tissue, by the name of connective tissue. In the case of ligament or tendon uniting muscles to bone, there can be no objection to this. Reichert was the first to group together various tissues widely different from one another, to the whole of which he gave the name of connective tissues, because they lie between, and so far connect, or, as Kölliker more correctly puts it, support various histological elements. Reichert imagined that, however different they were in structure and chemical composition, they were united together or continuous throughout the organism, and served as a substratum or basis-tissue to all the parts of the body. Kölliker is opposed to this view, and declares it is not so much their anatomical union as the genetical connexion between them and their correspondence in function which keeps them together. But when it is considered that these connective tissues are said to be the vitreous humour; mucous tissue, such as occurs in the lower animals, and gelatinous tissues of the embryo, and which must not therefore be confounded with mucous membrane; the areolar and elastic fibrous tissues, with their various modifications in tendon, ligament, etc.; cartilage; bone; and teeth,—the idea of grouping them together either structurally or functionally, and calling them by one name, must be admitted to be most transcendental and far fetched.

Virchow has, however, extended these tissues greatly. For example, cornea and the substance uniting the nerve-cells and fibres, are according to him connective tissue; and from some expressions (see p. 268) we are led to suppose he considers the grey matter itself as analogous with it. This nervous connective tissue, he calls *neuroglia* (nerve-cement) (p. 277), and the bodies it contains, instead of being nerve cells, are connective tissue corpuscles. He says,—

“There can, according to my firm conviction, be no doubt but that the larger cells which pervade the posterior nerves of the spinal marrow were nerve cells; but, on the other hand, it must be maintained with

equal positiveness, that where *neuroglia* is met with it also contains a certain number of cellular elements. Immediately beneath the surface of the cerebral ventricles, we commonly meet with spindle-shaped cells lying parallel to it, just like those which are found in other kinds of connective tissue; these become larger under certain circumstances, and, in oblique sections, often display themselves in the form of stellate cells.”

Having thus endeavoured to show that connective tissue in one form or another is present everywhere throughout the body, he points out that it contains round, oval, or stellate cells (connective tissue cells), which anastomose with each other, so that tendon, areolar texture, nervous tissue, etc., like bone and teeth, contain spaces and minute canals which serve the purpose of a nutritive system. There can be little doubt, however, that as Henle was the first to point out, Virchow has here made an extraordinary histological error, and confounded the spaces which lie between bundles of fibrous tissue with stellate cells. So in the cornea, he confounds the spaces running between its laminae with branching cells. In many cases, also, what he calls fine canals are no canals at all, but solid filaments resulting from the transformation of the cell walls, as Schwann correctly pointed out. Again, in other cases, he confounds the nuclei which remain permanently in fibrous tissues, and are visible on the addition of acetic acid, with cells, in the same way that he declares the lacunæ in bone to be cells, though they are manifestly only the nuclei of cells. This constant confusion between cells and nuclei has been well pointed out by Beneke, who showed that instead of a cellular pathology, Virchow ought to have spoken of a nuclear pathology. Thus the connective tissue theory, as he produces it, is made up of nothing but errors and contradictions.

But not only, according to Virchow, do the connective tissues serve the purpose, physiologically, of an accessory circulation by means of nutritive channels; he endows them with the power of producing all kinds of morbid growths, simple and malignant. Lest we should fail to state correctly his views on this subject, we quote his own words:—

“We may, with trifling restrictions, substitute for the *plastic lymph*, the blastema of the earlier, the exudations of the later writers, connective tissue with its equivalents, as the common stock of germs (keimstock) of the body, and directly trace to it, as the general source, the development of new formations.” (P. 398.)

The trifling restrictions referred to, we presume, relate to the fact that pus on the surface of mucous membranes is exceedingly common, and that under circumstances where the connective tissues have not only never been shown, but cannot even be suspected to originate it. To overcome this difficulty, it is maintained that epithelial cells also have the power of originating morbid growths, and that pus may be formed in

\* Cellular Pathology, as based upon Physiological and Pathological Histology. By Rudolph Virchow, Professor of Pathological Anatomy, etc., in the University of Berlin. Translated by Frank Chance, B.A., M.B. Cantab., etc. 8vo. London: 1860.

epithelial as well as in connective tissue corpuscles (p. 445). The mode in which this is brought about is by division and multiplication of the nucleus within these various cells; only that sometimes this *proliferation* of cells, as it is called, terminates in hypertrophy of normal textures, as bone and fibrous tissue; at other times, in pus, cancer, or even tubercle—as represented (Figs. 124, 137, 138, and 144).

Now, it had been long shown by Lebert that in fibrous tumours certain cells contained numerous nuclei, forming many nucleated cells, as they have been termed. Goodsir and Redfern have shown the cartilage cells when irritated to undergo the same endogenous growth, and the latter produced it artificially. Hughes Bennett described and figured a similar change in epithelial and in gland cells, and Paget in myeloid tumours. There can be no doubt, therefore, that under certain circumstances, fibre, epithelial, gland, cartilage, and cancer cells, have the property of multiplying endogenously. But, hitherto, it has been supposed that the included cells so formed were simply young cells of the parent tissue. It was reserved for Virchow to maintain that pus-cells—that is, new morbid cells—originate either in epithelial or fibre-cells, and that both cancer and tubercle also grow within the latter. On looking at the figures which he gives as illustrative of this discovery, and which we have previously enumerated, it will be confessed that they are very unsatisfactory. One of them (Fig. 144) is a mere diagram, and does not profess to have been copied from nature; and the others, though nominally representations of actual demonstrations, we fear also partake of the diagrammatic character. We have in vain endeavoured to see pus-corpuscles within epithelial or connective tissue cells. Nowhere have we seen any evidence that tubercle forms within fibre-cells, and still less cancer. These three morbid products are exceedingly common, and if Virchow's statements be correct, no difficulty ought to exist in demonstrating these things, and yet, though carefully and perseveringly sought for, we are not aware of any histologist in this country having yet been fortunate enough to see them.

We, cannot, therefore, but conclude that there is some fundamental error in observation; and if the mistake pointed out by Henle—certainly one of the first living histologists—be remembered, we can have no difficulty in conjecturing how this has originated. In making sections of fibrous tissues infiltrated with pus, cancer or tubercle, what more natural than that the corpuscles should accumulate in the spaces between the fibrous bundles? These, being regarded by Virchow as connective tissue cells, are considered not only as being filled with, but as having produced these morbid cells. Thus, one error has generated the other. As to pus forming within epithelial cells, he himself gives no figure in sup-

port of that notion. We may ask, therefore, if he himself has ever seen anything of the kind?

Having now endeavoured to show that the theory of cellular pathology, as developed by Professor Virchow, is neither new nor true, we consider it unnecessary to follow him among the numerous ramifications into which it leads in the course of the twenty lectures contained in the book. The fundamental idea being erroneous, it would be easy to show that all the arguments and conclusions he derives from it are equally so. Indeed, it is to us amazing that whilst revelling only among cells and imaginary proliferations, which nobody can see, he should overlook or attach no importance to the formative substances and exudations which are seen by every one, including himself. Thus, he admits there is an intercellular substance; but the use of this he does not point out. In several cases he calls it connective tissue, and attributes to it formative powers; so that, in such cases, there is no difference between him and other histologists except in words. The truth is, that this intercellular tissue of Virchow is the blastema of Schwann, and gives origin to cells in the manner correctly described by the latter distinguished observer. It is also admitted that there is such a thing as exudation; but it occupies a very trifling position in the system of cellular pathology. Thus, new bone, according to Virchow, results from a proliferation of pre-existing cells, and there is little reason even “to ask whether the callus proceeds from free exuded or extravasated matter. No doubt an extravasation takes place in the first instance into the space between the fractured ends; but the extravasated blood is generally pretty completely reabsorbed, and it contributes comparatively but very little to the real formation of the subsequent uniting media.” (P. 441). At p. 428 we find a figure representing the structure of a tumour in the jaw of a goat. It exhibits trabeculæ of bone, enclosing a soft, slightly fibrous substance, which is evidently an exudation, but which he calls connective tissue, because there are visible under a higher power (Fig. 132) triangular spaces between the bundles of fibres, which, of course, according to him, are the ever-recurring connective tissue cells. A more complete misinterpretation of facts it is scarcely possible to imagine. Again, inflammation, according to him, originates in irritation, and results in proliferation of cells. He is of opinion “that, *in the sense* in which it has usually been assumed to exist, *there is no inflammatory exudation at all*, but that the exudation which we meet with is essentially composed of the material which has been generated in the inflamed part itself through the change in its condition, and of the transuded fluid derived from the vessels” (p. 393).

All this seems to us very contradictory and opposed to fact—there is not and yet there is an exudation. Nay

he goes on to say that there are two forms of inflammation: "the *purely parenchymatous inflammation*, where the process runs its course in the interior of the tissue, without our being able to detect the presence of any free fluid which has escaped from the blood; and the *secretory (exudative) inflammation* (which belongs more to the superficial organs) where an increased escape of fluid takes place from the blood, and conveys the peculiar parenchymatous matters along with it to the surface of the organs" (p. 393). It thus turns out that there is after all an exudative inflammation, which we beg leave to think is the only true inflammation; whilst that so-called form of it, which Virchow names parenchymatous, is no inflammation at all, but evidently a process long known to pathologists which they regard as constituting morbid growths. In like manner it might be shown that the system of pathology built up by Virchow abounds in the greatest contradictions, and assumptions of novelties which, on being closely regarded, are only well known facts or processes with new names, or old names applied in a new sense, giving rise to the greatest confusion.

On the whole, this attempt of Professor Virchow to revolutionise pathology, and originate that great desideratum of German teachers—a new school—is a complete failure. It would be very unfair, however, not to give him the credit of perseverance in research. In the same manner that the wild chimeras of former philosophers led to much diligence in investigation, and to the occasional discovery of new and valuable facts; so, in his wild goose chase after proliferation of cells in all textures, Virchow has stumbled on a few real discoveries. Among them we are glad to enumerate the crystals of hæmatoidine, of black pigment in certain blood-corpuscles, and of cellulose and starch in the animal tissues. We have already seen that other discoveries to which he lays claim in this and preceding works have been copied from others, and only modified by him. Still Virchow has added facts and views to science which we gladly acknowledge, and which will serve to keep his name alive when his cellular pathology is forgotten. Like the enthusiastic searchers after the philosopher's stone or *elixir vitæ*, he has brought useful truths to light; while the ambitious dreams and hopes that stimulated his researches are not only illusory, but, in too many instances, contradictory, unreasonable, and even ridiculous.

We cannot conclude these remarks without thanking the translator of Professor Virchow's work for the excellent manner in which, on the whole, he has completed his task. Now and then there is a little confusion of expression, which, considering the hazy material he had to deal with, is by no means to be wondered at.

## THE WEEK.

It is a pleasure to announce that the Medical Act has, for once, been victorious in a court of law. The decision just delivered in Queen's Bench in the case of the "Queen v. the Registrar of the Medical Council" is a very important one. The judges have decided that the Council have not only the power of refusing to admit an "improper" person into their Register, but also that they have the power to erase the name of any person, although admitted on the Register, if he is proved to have committed an offence (such as, if known, would have excluded him from the Register) before his registration. Here is the reported case:—

"Mr. Sergeant Hayes had obtained a rule calling upon the Registrar of the General Council of Medical Education and Registration of the United Kingdom to show cause why the name of Richard Organ should not be restored to the register, from which it had been erased by order of the Council. The applicant applied to be placed upon the register as 'a person practising in the United Kingdom on foreign or colonial diplomas or degrees,' he having a German diploma. The Council, however, refused to do so, but put him upon the register as 'a person acting as surgeon in the public service,' he being a surgeon of several poor-law unions in Yorkshire. Subsequently, the Council erased his name under the 29th section of the Medical Act (21st and 22nd Vic. c. 90), which enacts, that if a registered medical practitioner shall be convicted of any felony or misdemeanour, 'or shall, after inquiry, be adjudged by the General Council to have been guilty of infamous conduct in any professional respect,' his name shall be erased. The infamous conduct referred to, it was contended, took place many years ago, and over which the Council had no jurisdiction to inquire.

"Mr. M. Smith and Mr. Sleigh appeared on behalf of the Council, and contended that they had a right to erase the name. The conduct alleged against the applicant was forgery and misrepresentation, falsehood and conspiracy. The applicant applied to be examined and admitted a member of the Edinburgh College, and was ordered to attend an examination; instead of which he got a person to attend and represent him, and he afterwards applied for his diploma as having passed his examination. The learned counsel contended that the Council having put the applicant's name on the register in ignorance of these circumstances, they had authority, upon being made acquainted with it, to erase him from the list. The question was the power and jurisdiction of the Council to examine into conduct previous to admission.

"Mr. Serjeant Hayes having been heard at considerable length for the applicant, contending that the powers of the Council only referred to acts committed after registration, and not before,

"The Court discharged the rule."

Our associate, Mr. A. B. Steele, writes, Jan. 14th, 1861, to us as follows:—

"In the admirable leader with which you commence your editorial career, you designate the JOURNAL as 'the voice of the profession,' and the mission of the Association to be that of upholding the rights and position of its members.

"I accept these conclusions, and desire to put them to a practical test by inquiring whether the Association is prepared to rest content with having, as you observe,