

Researches in Idiocy. By Dr. J. MIERZEJEWSKI, Professor in the Medico-Chirurgical Academy of St. Petersburg. Translated by Dr. D. HACK TUKE.*

The study of the anatomy of the brains of idiots is a vast field accessible to research, which may serve to throw light upon some questions of psychiatry, hitherto obscure, but which possess an undeniably practical value. It ought to enable us to comprehend better the questions which relate to hereditary insanity. It is undeniable that the vices of physical conformation of ancestors are transmitted to their descendants, and that this phenomenon is the *point de depart* of pathological varieties.

There are not only physical malformations, but also moral perversions, which are subject to the laws of hereditary transmission. We understand, in short, that moral perversions in the ancestors, accompanying malformations of the brain, are susceptible of being transmitted from one generation to another. We are disposed to admit equally the existence of anomalies of the brain in those individuals who present a predisposition to hereditary insanity. These malformations may remain a long time latent, until particularly favourable conditions allow of the degenerative force being developed. All that is advanced on the probable existence of cerebral anomalies with persons having a hereditary predisposition to insanity, rests generally upon hypotheses and very rational suppositions, but the physical, chemical, and anatomical demonstration is usually wanting. It is then our duty to study well the visible evident anomalies, which immediate observation demonstrates by the aid of modern scientific processes. In a word, the studies pursued on the brains of idiots ought to be the foundation stone, destined to bear the edifice of the science which has for its object to determine the physical signs of hereditary insanity.

(1.) In studying the brains of idiots, attention has specially been directed to their weight, although the weight of the brain cannot furnish sufficient indications for diagnosis, because there are idiots, the weight of whose brains may reach 1,800 grammes, and equal the weight of the brain of an intelligent man. The small weight of the brain can only

* We are indebted to Prof. Mierzejewski for this summary of a paper read by him at the Paris International Congress of Mental Medicine, Aug. 1878.

possess a diagnostic value in certain cases, because the well-formed brain may be reduced in its weight in consequence of different pathological lesions. In this case the normal brain never attains the extreme limit which occurs in the weight of the brains of idiots, and which may descend in adult idiots as low as 220 grammes, and with new-born microcephales to 100 grammes (case of Broca).

(2.) The form and the exterior conformation of the brains of idiots present sometimes a resemblance to those of animals. One brain is flat and oblong, like that of a camel; another resembles the brain of an elephant, in the small development of its frontal and ascending parietal convolutions; a third resembles a dolphin, in the smallness and richness of its convolutions. But this resemblance is deceptive; the arrangement of the convolutions, the size of the pons Varolii and of the medulla oblongata, is quite different from that which obtains in animals, and reveals a completely different type. This is also true of the brains of those idiots, whose cerebellum is not covered by the cerebral hemispheres, of which I have the honour to show you a specimen.

The mechanism of development of this anatomical condition in idiots is quite different from what it is in animals. It is the arrest of development, the atrophy, of the occipital lobes, which causes the uncovered condition of the idiot's cerebellum. It is the insignificant inclination of the pons Varolii during the first period of foetal life, which leads to the same results in animals.

(3.) The convolutions of the brains of idiots are very often arrested in their development, but an important question is, How to understand the arrest of cerebral development? The process of development of the brain comprises different phases; the arrest of development of the brain occurs because the organ, arrived at a certain point of the stage which it ought to pass, stops there, and does not continue to go through all the phases which characterise its formation. Regarded from this point of view, every idiot's brain ought to have its representative in the normal brain in course of development. Scientific literature possesses, undoubtedly, descriptions of the brains of idiots, which, by the external appearance of their convolutions, resemble the foetal brain. Unfortunately, the brains have not been submitted to a histological examination, and it remains to determine whether the arrest of development of the morphological parts of the brain, coincides with an arrest of development in the micro-

scopic structure of the nervous elements. The histological researches which I have made upon an idiot's brain have given me very remarkable results. The convolutions of this brain presented externally in their arrangement the foetal type; their nervous elements were as well-formed as in brains completely organised, but they were not so large as in normal brains. In this case the morphological arrest of the convolutions was accompanied by a perfect development of their histological elements, and the external form was not in accordance with the delicate structure of the tissue. Here there was not, consequently, a true arrest of development (morphologic and histologic), but a deviation from the type of normal development.

Up to the present time I have not met with a single description of the brain of an idiot in which the morphological arrangement of the convolutions, and the microscopic structure of their nervous elements presented the embryo form. The case observed by Harek, and that by myself, are perhaps the only exceptions in this respect. We must regard these exceptions, moreover, with some reserve.

The arrest of morphological development of the brain may include the whole hemispheres, or only exist in certain parts of the brain. All these arrests of development are, so to speak, monstrosities, which belong to the domain of Teratology.

(4.) All the brains of idiots cannot be classed under monstrosities; on the contrary, there are many which are only purely pathological types; that is to say, in such cases there is not a simple arrest of the normal development of the brain, but in consequence of the different pathological processes during uterine life, and the first years of infancy, the tissue of the brain has lost its normal qualities, or is replaced by a tissue which is foreign to it.

We hope that, in time, when the embryology of the brain will be more advanced, and the histological examination of the brains of idiots will be made more frequently, that the conditions of simple arrest of development will admit of explanation by purely pathological circumstances, and that the number of cases belonging to the category of pathological brains will be much increased.

(5.) We ought also to range among idiot brains, those which, by the arrangement of the convolutions, nearly resemble normal brains, while having the convolutions hypertrophied, or the convolutions so small and so rudimentary in their

dimensions, as to resemble the convolutions of the fœtus, but are distinguished from the latter by the richness of their secondary convolutions (case described by Fischer). But we do not know if such a state of the convolutions is compatible with the integrity of the intellectual faculties, or if these anomalies are found more frequently with idiots than with the sound minded. There are also brains, the hemispheres of which are composed of a large number of very small convolutions, which present secondary transverse sulci, and recall somewhat the convolutions of the dolphin. This anomaly of the convolutions may comprise both hemispheres (as in the case which I have described in the work presented to the International Medical Congress at Geneva, 1878), or may exist only in some convolutions, as in the brain of which I have the honour to exhibit a drawing; you see the parietal convolutions alone are subject to this anomaly.

(6.) With certain idiots, the morphological structure of the convolutions present, sometimes, anomalies which cannot be explained by a simple arrest of development, and which belong to the anomalies called by Pozzi *anomalies reverting through deviation of development*, that is to say, the morphology of the brain approaches, in its structure, that of the same parts in the inferior races, or the anthropoid apes. These anomalies are characterised by an excessive development of the external perpendicular fissure; hence, the occipital lobes have the form of a skull-cap as with monkeys. Similar anomalies have been described recently by MM. Pozzi, Guillaume, Sander, and François Fisher. But these observations are rare, and those which will be collected in future will show how far these anomalies are more frequent with idiots than with those whose intellectual faculties are sound. We may say, indeed, that these reverting anomalies have been observed in individuals endowed with normal intellect; a case of this kind has been published by Maynert in the "Archiv. für Psychiatrie," 1876. Professor Broca has had the kindness to show me the brain of a distinguished man of letters, who recently died, and with whom this anomaly was very well marked.

(7.) All the anomalies which the brains of idiots present may be combined together in the most diverse manner, and in one brain we may meet with not only different degrees of arrest of development, but also the reverting anomalies and purely pathological lesions.

(8.) We have often observed that the same parts of the brain

present, with different idiots, an unequal development. This fact, well studied, and accompanied by detailed clinical observations, may throw new light upon the study of intellectual development and upon certain characters of idiots, which have more particularly struck observers. Clinical observations show that there are idiots called *savants*. These are idiots who, while having general weakness of the intellectual faculties, are endowed with only one special and predominant faculty of imitation. It is thus that, there are in this class, some individuals who can apply their imitative faculty to drawing, singing; others who possess a special memory for proper names and words, but these faculties have quite a peculiar, and, so to speak, capricious seal, which does not submit to ordinary teaching. The savant-idiots may imitate an object perfectly well, but they cannot imitate another object which is quite analogous. In this relation they present a certain analogy with those labouring under aphasia, who can pronounce an entire word, but cannot pronounce separately the letters of which this word is composed. This faculty of imitation differs greatly with different idiots, and, like the different mental faculties, corresponds doubtless to different anatomical substrata. It follows, therefore, that, with different idiots, certain portions of the brain ought to be more developed than are the same parts with others, and *vice versa*. It would be most useful to trace the connection between certain imitative faculties in idiots and the preponderating development in them of certain parts of the brain. Unfortunately we have no researches upon this subject.

(9.) But it is only the histological examination of the brains of idiots which reveals to us the most minute and interesting lesions and anomalies in the structure of the nervous centres of these degraded beings.

Histological examination shows us sometimes hypertrophy of the most superficial layer of the grey matter.

This layer is very little developed with men in a normal state; with monkeys it is more developed than with man; and with dogs still more than with monkeys. We find with idiots an atrophy or an enormous development of the grey substance of the convolutions and the nerve-elements. These elements are not grouped regularly, but dispersed *pêle-mêle*; they are sometimes surrounded with calcareous envelopes. But that which is most interesting, is the fact that, along with a great richness of the grey substance, the whole system of communication of the convolutions among themselves may

be profoundly injured and completely arrested. The brain which I exhibited to the Geneva Congress last year, may serve as an example. The arrangement and the disposition of the grey substance presents great irregularities in this brain. In the normal brain (Fig. 1), a transverse section of



the convolutions presents between two sulci of the surface of the hemispheres a single curve of the grey substance, whilst in the brain of this idiot (Fig. 2), there exist many. It follows that the surface of the grey substance in this brain must be enormous. The thickness of the grey substance of the convolutions is also greater than in the normal brain. In the different points of the hemispheres, the thickness of the grey substance varies between $2\frac{1}{2}$ and 7 millimetres. This phenomenon is explained by the fact that, in the brain of this idiot, the commissural fibres which unite the adjoining convolutions only exist in certain directions, whilst in large portions of the convolutions there are only "fibres of association" (Meynert), which unite the most distant convolutions. Thus with this idiot, the most distant parts of the hemispheres are united by nerve fibres, whilst the adjoining convolutions are deprived of these elements, and instead of these commissural fibres there exist only embryonic elements enormously developed, and of variable dimensions (maximum length = $\cdot 018$, maximum breadth = $\cdot 010$), their protoplasm showing great transparency and a very distinct nucleus.



Speaking generally, then, the richness of the grey substance, and the abundance of the nerve cells, may be accompanied by idiocy. But in this case, the system of communication between the convolutions is arrested in its development, and this failure in the connecting-links—this want of harmony in the development of the different nerve elements—renders an organ imperfect which is so prodigally endowed in certain respects, but so poor in others.

(10.) It is necessary, also, to mention those brains of idiots which appear well-formed, and of considerable weight, but which belong to individuals whose heart is very small, and its volume in consequence is out of all proportion to the size of the body.

Dr. Hagen having observed a case of this description, draws the conclusion that idiocy may depend upon the feebleness of the cerebral circulation, and may occur in a brain

perfectly well formed. This view is in entire accordance with the teachings of physiology, and the experiments of Brown-Séguard upon a head which had been guillotined; besides which, it has been observed with microcephalous idiots that, during fever, when the activity of the cerebral circulation is increased, the intelligence has appeared to be much greater than in the normal state. The observation of Hagen is not, however, complete; it lacks the histological examination of the brain, which alone can confirm these views, or give them another interpretation.

*On Nocturnal Epilepsy, and its Relations to Somnambulism.**

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Few problems are we called upon to solve surpassing in importance that of demonstrating the insane nature of the evil propensities and criminal deeds, which are the outcome of nocturnal epilepsy. If, during the night, a man be periodically roused from his sleep in great bewilderment and mental agony, that quickly cease; or, if in the midst of apparent sanity, he were to be found, unexpectedly, in the morning, either maniacal, or sullenly disposed to unprovoked acts of extreme violence, we may, with confidence, diagnose that he is an epileptic, and irresponsible for what he has perpetrated.

Terrific dreams and somnambulism are commonly conjoined with highly neurotic temperaments, and are evidence, when closely studied, of the incubation of mental disease. Although these two nocturnal psychical phenomena are harbingers of insanity, this, in other forms than epilepsy, never sets in immediately after, or during sleep, but is, on the contrary, announced by obstinate, distressing insomnia. Indeed, the nocturnal accession during sleep of some of its most pernicious paroxysms is one of the distinctive marks exclusively belonging to the epileptic neurosis.

Unconsciousness, convulsions, and deranged mentality are the main elements of epilepsy. The predominant degree of

* The important bearing of this article, from the pen of so high an authority on epilepsy as the writer, upon the interesting case reported by Dr. Yellowlees, in the *Journal* for October last, will be seen by those who read both papers.—
[Eds.]