

ARTICLE II.—*On Idiocy, especially in its Physical Aspects.* By Dr W. W. IRELAND, Scottish National Institution for the Education of Imbecile Children, Larbert, Stirlingshire.

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### *Microcephalic Idiocy.*

As far as my own measurements go, they confirm the conclusion of Esquirol, that the average size of the heads of idiots, excluding those of hydrocephalic ones, is somewhat smaller than the average size of healthy people; but to this rule there are many exceptions. Some have heads larger than the average size of sane individuals of the same age; and I have measured heads of people of normal intelligence, which are smaller than any in the Larbert Institution, with two or three exceptions. Moreover, those idiots who have larger heads do not surpass in intelligence those who have smaller ones. Save in the cases of hydrocephalic and microcephalic idiots, the size of the head gives no estimate of the comparative intelligence of the children.

Seguin gives an able summary of the state of the question in the following passage:<sup>1</sup>—“Gall, giving a strong impulse to the investigation of the functions of the brain, had called up the question of the cause of idiocy: a skilful theorist, he thought he had discovered in idiots proofs of the truth of his system of phrenology. The authors who succeeded him—Georget, Esquirol, Lelut, Foville, Calmeil, Leuret, Pritchard—seem, on the contrary, to have studied idiocy only to use its phenomena for the destruction of the system of Gall, but not for the benefit of the poor idiots whom they declared incurable. With their single polemical object in view, they spent thirty years in measuring and weighing the heads of living and dead idiots, and they arrived at the following conclusions:—

“1. No constant relation exists between the general development of the cranium and the degree of intelligence.

“2. The dimensions of the anterior part of the cranium, and especially of the forehead, are, at least, as great among idiots as among others.

“3. Three-fifths of idiots have larger heads than men of ordinary intelligence.

“4. There is no constant relation between the degree of intelligence and the weight of the brain.

“5. The different degrees of idiocy are not measurable by the weight of the brain.

“6. A cranium, perfectly formed, often encloses a brain imperfectly formed, irregular, etc.

“7. Sometimes the brain of idiots presents no deviation in form,

<sup>1</sup> See Report of the Commissioners on Idiocy to the General Assembly of Connecticut. New Haven, 1856, p. 57.

colour, and density from the normal standard; it is, in fact, perfectly normal."

It is, however, agreed that there is a certain minimum size of head below which the possessor is necessarily an idiot. Voisin says that the proper exercise of the intellectual faculties is impossible with a head of from eleven to thirteen inches in circumference, and a measurement of eight to nine inches from the root of the nose to the posterior border of the occipital bone. To this rule there has never been an exception. He thinks that heads from fourteen inches to seventeen inches in circumference, and from eleven to twelve inches for the arc comprised between the root of the nose and the foramen magnum, are too small for ordinary intelligence; but heads of from eighteen to eighteen and a half inches, though smaller heads, allow of the regular exercise of the intellectual faculties. Mr George Combe, who must have measured a large number of heads, apparently quoting this passage of Voisin,<sup>1</sup> renders it, "heads of eighteen inches round give intellectual manifestations regular, but deficient in intensity." Mr James Stratton measured the head of a boy in Aberdeen of eighteen inches circumference, whose brain, by his system of computation, was estimated at 82 cubic inches; "but it was well balanced, the constitutional temperament highly nervous, and the boy is quite as intelligent as could be expected of his age in his circumstances."<sup>2</sup>

I think we may therefore assume that below seventeen inches in circumference the manifestations of intellectual power would be feeble. But heads of this small scale are rare even amongst idiots, for idiocy is generally the result of disease, not of smallness of the brain.

Microcephaly is the rarest of all kinds of idiocy; nevertheless, owing to the speculations of Darwin, microcephalic idiots have been carefully studied, whereas those who possess brains of normal size have met with little attention. Charles Vogt has collected, from all available sources, as many as forty-two cases of microcephales, and his monograph<sup>3</sup> will probably remain the principal work on the subject for a long time to come.

Microcephaly may be either general or partial. Certain portions of the encephalon may be abnormally small or altogether wanting; but in general the deficiency consists in the smallness of the hemisphere. The nerves of special sense are generally well developed, and the ganglia of the base of the skull and the spinal cord are

<sup>1</sup> I give the sentence in the author's own words:—"Les têtes de dix-huit pouces à dix-huit pouces et demi sont encore de petites têtes quoiqu' elles permettent à l'exercice régulier des facultés intellectuelles." *De l'Idiotie chez les Enfants*, par Félix Voisin, Médecin en Chef de l'Hospice des Alienés de Bicêtre. Paris, 1843, p. 73.

<sup>2</sup> See Review of Contributions to the Mathematics o<sup>o</sup> Phrenology, by James Stratton, Zoist, vol. iii. p. 426.

<sup>3</sup> *Mémoires sur les Microcéphales ou Hommes-Singes*, par Charles Vogt. Genève-Bâle, 1867.

much nearer the normal size than the hemispheres. The cerebellum also is much longer than in the normal brain. In the case of a microcephalic idiot in the asylum at Bareilly, the cerebellum was one-half of the weight of the cerebrum, the ordinary relation being one to eight. In many cases the superior sutures of the cranium are closed. In three heads of microcephales dissected by Gratiolet, the sutures by the base of the skull were behind the usual stage of development, while those above were closed; the inverse condition is often met with in cretins. So many cases have been collected of microcephales with open sutures, that it is not likely any one<sup>1</sup> will continue to hold that the small size of the brain is owing to the sutures closing in and thus hindering its growth. Even in those cases where the sutures have closed in before birth, and which it must be granted are not uncommon, how can it be decided whether the brain ceased to grow because the sutures are closed, or whether the sutures closed in because the brain ceased to grow, or, lastly, whether both the brain and its coverings ceased to grow under the influence of a common cause? It seems to me that if the sutures closed in and the brain continued to grow, the symptoms described as following hypertrophy of the brain would be produced, which I think is not the case.

M. Cruveilhier<sup>2</sup> speaks of a microcephalic child which lived eighteen months, where the vertical diameter of the cranium measured no more than an inch. "This child," he adds, "never gave any sign of intelligence; its limbs were incessantly in movement; it expressed its wants by cries; all the bones of the cranium were united without any suture." Cruveilhier does not describe the appearance of the brain, which must have been so small. It died of convulsions, to which it was subject from birth. Professor Turner<sup>3</sup> cites the case of an idiot recorded by Theile, where the brain weighed only 10·6 ounces; another case, by Mr Gore, where it weighed 10 ounces and 5 grains; and a third case, from Mr Marshall, where the weight was as low as 8½ ounces. The heads of the Aztecs were amongst the smallest known. These were two children who were exhibited in America, England, and France, about twenty years ago, with a trumped-up story about their

<sup>1</sup> It seems to me that Vogt has misstated the views of Virchow when he says that the German pathologist holds that—"La microcéphalie doit être nécessairement combinée avec lessynostoses prédominantes de la voûte crânienne." —P. 88. In reply to this, it is enough to cite Virchow's own words: "Dass es Fälle von Mikrocephalie ohne Synostoses der oberflächlichen Nähte gibt habe ich früher erwähnt."—Untersuchungen über die Entwicklung des Schädel-Grundes, von Rudolf Virchow; Berlin, 1857, s. 80-105. Virchow über Die Entwicklung des Schädel-Grundes, s. 80-105. Rokitansky, Lehrbuch der Pathologischen Anatomie, Zweiter Band, Wien, 1856, p. 433. Dr Westphal, in Proceedings of Berliner Medicinisch-Psychologische Gesellschaft, reported in Archiv für Psychiatrie, iv. Band, 1 Heft; Berlin, 1873, s. 261.

<sup>2</sup> Anatomie Pathologique Générale. Paris, 1856, tome troisième, p. 164.

<sup>3</sup> See his paper on the Convolutions of the Human Brain considered in relation to the Intelligence, in the West Riding Lunatic Reports, vol. iii. p. 10.

origin. The following description is taken from Dr Dalton's Treatise on Human Physiology:<sup>1</sup>—

"They were boy and girl, aged respectively about seven and five years. The boy was 2 feet 9 $\frac{3}{4}$  inches high, and weighed a little over 20 pounds; the girl was 2 feet 5 $\frac{1}{2}$  inches high, and weighed 17 pounds. Their bodies were tolerably well proportioned, but the cranial cavities were extremely small. The antero-posterior diameter of the boy's head was only 4 $\frac{1}{2}$  inches; the transverse diameter less than 4 inches. The antero-posterior diameter of the girl's head was 4 $\frac{1}{3}$  inches; the transverse diameter only 3 $\frac{3}{4}$  inches.

"The habits of these children, so far as regards feeding and taking care of themselves, are those of children two or three years of age. They were incapable of learning to talk, and could only repeat a few isolated words. Notwithstanding, however, the extremely limited range of their intellectual powers, these children were remarkably vivacious and excitable. While awake, they were in almost constant motion; and any new object or toy presented to them immediately attracted their attention, and evidently awakened a lively curiosity. They were, accordingly, easily influenced by proper management, and understood readily the meaning of those who addressed them, so far as this meaning could be conveyed by gesticulation and the tone of the voice."

Seguin,<sup>2</sup> who saw the Atzees in America, thought them susceptible of a certain amount of education. "He considered them," says he, "capable of being elevated from the level of the monkey to that of obedient, sensible, and happy children. This prospect, frankly laid out, did not seem to please their keeper, either because he did not seem to believe it possible, or because he feared it would have diminished the chances of his success."

Dr James Murray Lindsay, now of the Derby Asylum, has kindly allowed me to publish the case of a very small brain which he examined. It belonged to an idiot who was admitted into the Hanwell Asylum on the 5th June 1865. She was then eleven years old, and able to walk. The limbs were misshapen with rickets. She was stunted in growth, and of a childish appearance. She was unable to say a single intelligible word, but chirped like a bird. She seemed to pay no attention to sounds, save the jingling of keys or the playing of musical instruments. "She was," writes Dr Lindsay, "not nearly so intelligent as a monkey I have here, or a dog which I had at Hanwell." She died on the 16th April 1871, in the seventeenth year of her age, having been nearly six years in the asylum. "The chest, spine, and limbs, were found greatly deformed. The heart was very small, weighing 2 $\frac{1}{4}$  ounces, with a valvular opening near the foramen ovale. The antero-posterior diameter of the cranium was only 4 $\frac{1}{2}$  inches; the

<sup>1</sup> Philadelphia, 1871, p. 439. The book has an engraving of these children.

<sup>2</sup> See Idiocy. New York, 1866, p. 343.

lateral,  $3\frac{1}{2}$  inches ; measured from ear to ear across the vertex, it was  $8\frac{1}{2}$  inches. The calvaria were very thick and dense, especially in front and near the parietal ridges. The brain weighed no more than 13 ounces. The convolutions were shallow and few in number. The cerebrum was wanting in development posteriorly, and did not overlap the cerebellum. The brain-substance was softened and watery throughout. The ventricles were dilated with serum. The choroid plexuses were œdematosus." Thus the brain was not only extremely small, but what was of it was diseased.

In an Indian Report we have a notice of a brain even smaller than this in the Bareilly Asylum. "During the year," writes Dr J. H. Lock,<sup>1</sup> the superintendent, "one of two microcephalous idiots in the asylum died of dysentery ; he was unable to articulate, walked very weakly, with a half-running gait, could only be made to understand about his wants for food and clothing ; and was, in fact, very little raised above the condition of one of the lower animals. I am sorry I cannot give his weight, but his height was 4 feet 8 inches, and the weight of his brain—cerebrum,  $6\frac{1}{2}$  ounces ; cerebellum,  $3\frac{1}{2}$  ounces ; pons and medulla oblongata,  $\frac{1}{4}$  ounce. The convolutions were rather flatter than usual on the lower side of the brain, and the middle lobe was less prominent below than it generally is ; otherwise the brain was normal."

Vogt believes microcephaly to be a case of atavism, the appearance of a type of brain inherited from some very remote ancestral ape. As an illustration, he gives the occasional appearance of the two supplemental toes in the horse, which, he thinks, indicates its descent from the hipparion, an extinct animal of the Pleiocene period, which had two shorter toes on each side of the hoof—somewhat like the posterior toes of the deer and ox. This, Vogt observes, disappears teratologically as an arrest of development, for in the embryo horse the representatives of the lateral toes appear, but only to be incorporated at an early date with the single row of metacarpal bones and phalanges. In the same way, the brain of the microcephalic idiot is the result of arrested development of a human brain checked in its evolution at the simian stage.

The observations of Gratiolet are far from confirming this theory. "The study of the brain of microcephales", he writes,<sup>2</sup> "has furnished me with other reasons for proving through anatomy the absolute distinction of man. On comparing attentively the brain of apes with that of men, I found the arrangement of the central

<sup>1</sup> See General Report, No. 4, on Lunatic Asylums, Vaccination, and Dispensaries in the Bengal Presidency for the year 1871, compiled by Assistant-Surgeon K. M'Leod, A.M., M.D. Calcutta, 1873, p. 25.

<sup>2</sup> Mémoire sur la Microcéphalie considérée dans les Rapports avec la Question des Caractères du Genre Humain, par le Docteur Pierre Gratiolet ; Journal de la Physiologie de l'Homme et les Animaux. Paris, 1860, p. 110.

convolutious to be in adult age the same in both groups. If one went no further, there would not be sufficient grounds to separate man from animals in general, but the study of development gives us a real distinction. The temporo-sphenoidal convolutions appear first in the brain of the ape, and the frontal lobe last; but exactly the opposite takes place with man—the frontal convolutions appear first, the temporo-sphenoidal last. Thus the same series is repeated in the one case from Alpha to Omega, in the other from Omega to Alpha.

"From this fact, which was rigorously verified, there flows a necessary inference: no arrest of development can make the human brain more nearly resembling that of the ape's than it is in the adult; far from that, it will differ so much the more the less developed it is. This inference is completely justified by the view of the microcephalic brain. At first it might be taken for the brain of some new and unknown ape; but the slightest attention is enough to save one from this error. In the ape the parallel fissure is long and deep, and the sphenoidal lobe is marked by complicated furrows. In the microcephale, on the other hand, the parallel fissure is always incomplete, and sometimes awanting, and the sphenoidal lobe is almost entirely smooth. That is not all: in the microcephale the second bridging convolution, between the parietal and occipital lobes, is always superficial, a character peculiar to man.<sup>1</sup> In the pithecæ, on the contrary, the convolution is constantly hid under the operculum of the occipital lobe. Thus, in the depth of their degradation, the brain of the microcephale presents human characters often less voluminous and less convoluted than those of the ourang or chimpanzee; they do not become similar. The microcephale, however low he may be, is not a beast, but a diminished man.

"I have examined the question, Does microcephaly precede birth? Of this there can be no doubt. In one of the cases of microcephaly which I have studied, the general form of the brain and of the fissure of Sylvius showed that the monstrosity was at least contemporary with the fifth month. It is probable that this state depends upon some cause: early under the influence of some primordial generative weakness (*asthénogenie primordiale*), forms are produced which differ from all normal states. Moreover, in the new-born child, in its normal condition, the arrangement of the cerebral convolutions is complete in all its parts. If microcephaly were after birth, these convolutions would remain, and the volume of the brain alone would be diminished; but it is not so; the growth has languished from the beginning, its fold is shortened, and has stopped growing too soon."

<sup>1</sup> Professor Turner is inclined to doubt the correctness of the views of Gratiolet on this point. See his "Notes on the Bridging Convolutions in the Brain of the Chimpanzee," from the Proceedings of the Royal Society of Edinburgh, 1865-66.

Gratiolet remarks that those microcephales in whom the convolutions are so little complicated are all dwarfs.

The brain of Sophie Wyss, of whom there is a detailed account in Vogt's work, was exhibited by Dr Cramer at a meeting of medico-psychologists at Zurich.<sup>1</sup> Its capacity was 360 cc. Two other brains of microcephales were shown at the same time. In all these brains Dr Cramer pointed out the island of Reil was uncovered by the temporal and parietal gyri, while in the monkey the island is always covered.

Dr Cramer had, however, read of microcephalic brains which approached more nearly those of the ape.

In the microcephales the impressions of the senses are lively. They are fond of moving about, but have little power of continuous attention. Their restless motions recall those of the butterfly. It would appear that they are late in learning to walk; but in general they have the free use of their limbs, which Gratiolet accounts for by the comparatively large development of the cerebellum.

If the brain be healthy, the prognosis is better than that of many cases where the brain, though of normal size, is the seat of chronic disease. I have heard of several cases where, though the head was very small, the mental manifestations were greater than one would be disposed to believe; but I am not inclined to repeat details where I cannot furnish measurements more precise than those reproduced from the memory.

Vogt and other disciples of Darwin see in the mental characteristics of the microcephalic idiot something resembling those of the anthropoid ape. It seems to me that the intelligence of a monkey is very different from that of an idiot. You cannot reach the simian intellect merely by deducting so much from the human. It is different in kind as well as in degree. One might as well expect to find the same character of intelligence in an infant of two months old and in a full-grown chimpanzee, because the cranial contents were about the same. The mental powers which the monkey possesses are in perfect accordance with his organism. His agility in climbing and swinging himself from branch to branch is something marvellous. I have seen whole flocks of monkeys running down a wooded hillside with the greatest rapidity, without ever touching the ground, leaping from one branch to another, sometimes laying hold with the superior, sometimes with the inferior extremities, never tumbling, and scarcely ever missing their aim. This demands some kind of mental as well as physical powers, and cannot be clouded over by the vague word instinct. Monkeys, as every one knows, are extremely alert, watchful, and nimble; very careful against wild animals; they do not lie down to sleep, but sit upon trees all night; their slumbers are very light; they are attached to and careful of their young.

<sup>1</sup> See the *Correspondenz-Blatt für Psychiatrie und gerichtliche Psychologie*. Februar 1873.

On the contrary, microcephalic idiots, though in general more lively than those of other classes, have no fondness for climbing, and are as destitute of animal instincts as they are of human intelligence. They have no powers either of feeding or protecting themselves from danger, and if left to themselves would soon perish. They present the effaced lineaments of a human being, which only a wandering fancy will mistake for those of an ape. What qualities they have are of a human character. They laugh at what amuses them; they have human sympathies and human affections. Where they learn a few words, they use them as human beings do to signify things. Their tendency to imitation is often strong, and reminds a superficial observer of the monkey; yet imitation is also strong in the human being, especially in children. The resemblance between microcephales and apes seems to me to rest especially upon the negative quality of stupidity. Vogt remarks that many of them do not speak at all; but then it is clear the cases he describes never received that species of training which is required for beings of their low mental capacity. I cannot at present recall more than two cases of microcephalic idiots who were sent to a training school. In both the head was very small. In one who is at present in the Royal Albert Asylum at Lancaster,<sup>1</sup> the dimensions are, or were in 1871—

	Inches.	Centimetres. About
Anterio-posterior, . . . . .	7 $\frac{7}{8}$	19 $\frac{1}{2}$
Circumference, . . . . .	14 $\frac{1}{8}$	36
Transverse, . . . . .	9 $\frac{7}{8}$	25

This little fellow is thus noticed in the Report for 1872 of the Royal Albert Asylum:—

"F. Y. P., admitted February 1871, aged 7. An active, restless boy, with peculiarly small head. On admission speech was absolutely wanting, and the power of attention was very feeble. Now (September 1872) says after teacher 'P,' 'I,' 'see,' 'me,' 'D,' and 'C,' and is an attentive pupil at object-lessons."

A boy is mentioned by Dr Wilbur, in his Report of the New York State Idiot Asylum for 1857, who had a head of only 13 $\frac{1}{4}$  inches in circumference. He was admitted at the age of eleven, and was mute. After a year he learned the names of all the objects in the school-room and about the house, and the names of all the pupils in the school. It may be here noticed that though many idiots are mute, I cannot recall a single instance where an idiot picks up words which he cannot understand, like a parrot or a starling; and they often understand what is said to them years before they commence to speak, and some who understand many words remain mute for life. I know of one small-headed idiot

<sup>1</sup> See the Journal of Mental Science for July 1872, p. 303, and for October 1872, p. 351.

who seems somewhat dull of hearing; he only uses two words, "me" and "no," but always in a correct sense, whether separately or combined.

### *Congenital Idiocy.*

The phrase congenital or born idiocy is no new one. Idiocy, writes M. Parchappe,<sup>1</sup> depends upon congenital atrophy of the brain; idiotism upon an atrophy following upon a chronic affection. Other French physicians have used the term idiocy to signify a congenital vice; imbecility to denote a disease acquired after birth. It ought to be noted that the term congenital idiocy is here employed in a somewhat different sense to comprehend all those cases which, shrouded in the obscurity of intra-uterine existence, cannot be traced back to any known specific disease. It thus comprehends the cases whose pathology cannot be properly diagnosed till after death. Thus, cases of inflammation of the brain occurring before death are, as far as my knowledge reaches, not distinguishable from other congenital cases. A microcephalic idiot is a born idiot, but I do not include him under the term congenital. In process of time, by carefully studying the symptoms in life and the lesions after death, we may be able to resolve congenital idiocy into some new or old classes. In the meantime, a large number of our cases must still be included under the heading of congenital idiots. At present, if we cannot classify them in a more precise way, we at least may save confusion by putting them aside from the other classes, and inviting attention to the unresolved problems which they represent.

The predisposing causes which have been assigned for congenital idiocy are numerous, but their operation is vaguely understood. Anxiety and fright to the mother during gestation is frequently put down as the original cause. As may be supposed, there is often a hereditary connexion—insanity, epilepsy, or some other nervous disease, is known to exist in the family; and sometimes, too, the tendency has been intensified by a consanguineous marriage. In these cases occasionally the child is born idiotic, and grows up without taking any fits, while another child, born apparently with normal intelligence, inherits a tendency to fits which bring on idiocy in their course. Jastrowitz has indicated hydramnios as a probable cause of congenital idiocy. Professor Betz<sup>2</sup> of Vienna, in a demonstration of the brains of an imbecile and two idiots, has noted the difference of the convolutions. He finds the characteristic distinction in the arrangement of the gray matter, which is different both from the normal human brain and from that of the ape. The bridging convolutions at the base of the external occipital fissure were found deficient in the idiots. In normal human beings the

<sup>1</sup> *Récherches sur l'Encephale, sa Structure, ses Fonctions, et ses Maladies, par M. Parchappe.* Paris, 1838, p. 58.

<sup>2</sup> *Psychiatrisches Centralblatt, Nr. 7, 25 Juli 1873.*

gray substance of the brain is a conjoined mass; in these idiots the connexions were not so close (*auseinander geworfen*).

It seems very probable, from the researches of Jastrowitz and other microscopists, that the deficiency in congenital idiocy may consist in the structure of the tissues of the brain, in the persistence of anatomical elements which are normal in the embryo, but which ought to have passed into another form for the mature human being.

A very common accompaniment of congenital idiocy is the keel or saddle-shaped palate. The palate within the alveolar processes resembles the impression made by the keel of a ship, or the inside of a saddle looked at from behind; the jaw is narrow rather than long, and the furrow in the middle becomes deeper towards the back of the hard palate. The teeth are generally bad; about the age of ten or twelve they commence to look black near the margin of the gum, and rapidly decay and fall to pieces, so that many idiots before they are twenty years of age have nothing but a few blackened stumps. The teeth generally decay most rapidly in the upper jaw. I believe that deformities of the heart are also common with congenital idiots. The organ is small and feeble; the valves close imperfectly, or there is an open foramen ovale; the circulation is feeble, and the extremities are habitually cold. Other deformities are met with in different parts of the body; the most common are hernia, clubfoot, wad-shaped fingers, squinting and rolling of the eyes.

Congenital idiots are seldom well made, often of the scrofulous diathesis; sometimes, however, they are strong and good-looking, with well-formed heads, good teeth, and no deformities whatever.

Congenital idiots present every variety of mental power or feebleness, and are not less educable than other classes.

#### *Cretinism.*

While little of a scientific character has been written on sporadic idiocy, the literature of cretinism is very extensive; but it is not my intention to enter at any length into the subject, though, for the sake of clearness, it is difficult to avoid going over what seems to be the most important points made out in connexion with this interesting disease. The definition of cretinism reposes more upon its etiology than upon its pathology; for, in our imperfect state of knowledge, etiology sometimes guides us to true pathology, and pathology leads us back to new views on etiology; as difference in the cause implies difference in the effect, and a different effect implies a new cause or combination of causes. Cretinism is an endemic disease, its areas being generally capable of clear definition. It is very common in certain valleys of the Alps, where it has attracted most attention; but it is not confined to any quarter of the globe. It has been found amongst the Cordilleras as well as the Himalayas, the Pyrenees as well as the Crapak Mountains, in Chinese Tartary, in Sumatra and Java, in the Isthmus of Darien,

in Madagascar, and many other places. It is not confined to valleys of mountainous countries, being found in parts of the Terai, at the foot of the Himalayas, in some villages in the Punjab, and in the plains of Lombardy and the Black Forest of Baden. It is, however, most common in shut-up valleys, and has a close, though unexplained, connexion with goître. Nowhere does cretinism occur where goître is absent; but goître may occur where cretinism is unknown or rare.

The specific cause—something in the air, earth, or water, or in all of them, like the malaria of intermittent fever—is only known through its effects on the human body. It has not yet been isolated either by inference or experiment; and, indeed, we know less of it than about the character of paludal miasma. The accumulation of decaying vegetable matter in certain situations, and at known temperatures, will surely cause the appearance of ague amongst those dwelling near; but there are many shut-in valleys, resembling in all respects the usual haunts of cretinism, where, nevertheless, it is never heard of.

It seems to be more common on rocks of magnesian limestone, but is also known to be rife in valleys where the primary or schistose rocks are the main or only formations. It is not hereditary in the constitution of the parent. A man and his wife with hereditary tendency to insanity cannot avoid transmitting the vice to the children, should they flee to the ends of the earth; but parents leaving the valleys of the Aosta, or the Isère, or the Valais, for places where cretinism is unknown, leave behind them the danger of having cretin children. On the other hand, the intermarriage of goitrous parents, or where the woman is cretinous, as sometimes happens, increases the danger of cretinism in the children.

In describing the appearance of cretins, authors have collected deformities from different cases, so as to make up the portrait of a monstrous creature, which assuredly is rarely to be met with. The most characteristic traits which occur in cretins are the stupid, monotonous facial expression, the nose depressed at its root and broad at the wings, the remarkable distance between the eyes, occupied by a hollow, from which the root of the nose seems to issue; the eyes dull and heavy, the broad zygomatic arch, the wide mouth, the broad lips, and the thick tongue. The teeth are generally bad, and soon come to decay; sometimes first teeth are not renewed. Cretins rarely attain the usual height. Many are dwarfs no higher than three feet. The limbs are often disproportioned, the walk awkward—what is called the “Bärengang” or bear gait in the German parts of Switzerland. The neck is generally short and thick, and from one-third to two-thirds of cretins are said to have goître.

Virchow has called attention to the early synostosis of the spheno-basilar bone in cretins, which causes the clivus to descend with an unusually rapid slope, so that it approaches to a right

angle in relation to the body of the sphenoid. This prevents the elongation of the base of the skull, and consequently of the brain, from the foramen magnum to the crista galli.

In a new-born cretin which was carefully dissected by Virchow, the whole length of the base of the brain was found fourteen to sixteen millimetres less than usual, and the angle between the posterior part of the sphenoid and basilar bone was from  $42^{\circ}$  to  $46^{\circ}$  more acute than normal. The synostosis of the sphenoid and basilar bone had already taken place. I have no intention of entering at present into the question whether this condition is a necessary cause—a frequent or invariable concomitant of cretinism. Virchow does not explain, on physiological grounds, why a diminished growth of a part of the base of the brain should cause idiocy. The sutures on the upper part of the skull generally remain open incretins, allowing the hemispheres to increase to a normal size, and even on the floor of the cranium there are other sutures which remain open, and allow room for the growth of the base of the brain, both laterally and longitudinally.

The older observers paid more attention to the state of the brain than to that of the sutures; but they could not fail to observe the unusual steepness of the basilar portion of the occipital bone, which made it descend almost at a right angle to the sphenoid. Ackermann<sup>1</sup> had observed this in two skulls which he had seen in the Museum at Padua. Foderé<sup>2</sup> quotes the dissections of Malacarne to the same effect. A greater size of the jugular foramina incretins has also been noticed by many observers. A collection of the lesions and deformities found incretins is contained in the Sardinian Report on Cretinism. They are of a diversified character; and one reason of this, no doubt, is, that all cases of idiocy occurring in districts where this form of idiocy is endemic are classed ascretins: thus, hydrocephalus and cerebral haemorrhage are put down as lesions found in the brains ofcretins; but we have no proof that the miasma which causes cretinism, whatever it may be, acts so as to exclude other causes which produce idiocy in countries where cretinism is unknown, and strangers coming into the countries where the disease is endemic have children who becomecretins. It has been known from time immemorial in Valais, as well as the canton of Berne and elsewhere, that mothers who pass the last months of their pregnancy and bring up their children for several years at high elevations where cretinism is unknown, can thus save them from the disease. According to the Count Rambuteau, Prefect of the Simplon in 1813, many children remain perfectly healthy

<sup>1</sup> See Ackerman über die Kretinen eine besondere Menschenart in den Alpen. Gotha, 1790, s. 33-34.

<sup>2</sup> Foderé, Traité du Goître et du Cretinisme. Paris, An. VIII., para. LXXXI., p. 145.

Doctors Eulenberg and Ferd. Marfels, in a little book, Zur Pathologischen Anatomie des Cretinismus, Wetzlar, 1857, confirm the observations of Virchow by new ones of their own.

for the first five or six months of their lives, frequently as long as three or four years, when suddenly symptoms of cretinism appear, and rapidly progress. The children who afterwards become cretins are often born with a small goitre; but many cretins have no goitre, and many children with goitre are not cretins. Children with a well-marked tendency to cretinism can be often saved from it by being shifted to places where it does not appear. Sometimes the intelligence of the cretin seems to grow like that of other children; but it gradually begins to be arrested. Guggenbühl, who was the first to educate cretins in a successful manner, laid considerable stress upon conveying his patients to a healthy situation beyond the reach of the endemic cause. He claimed to have made a number of total cures, and the improvement of his cases was attested by many competent authorities, some of which are cited in his work. I have, however, been assured by the teachers of several training schools visited by me in Switzerland, that cretins do not seem to improve under training any faster than idiots of other classes.

#### *Idiocy by Deprivation.*

This condition, if it be not idiocy, simulates it so closely, that it is needful to say a few words about it. As is finely stated in the aphorism quoted by Sir William Hamilton: *Cognitio omnis a mente primam originem, a sensibus exordium habet primum.*

A being deprived of sight and hearing, the two senses most useful in perception, is, even when in possession of a potential intellect of good capacity, in reality an idiot as far as its relations with the outer world go. It is a mere recipient of sensations, from which it cannot, without some very special culture, deduce sufficient explanations of the phenomena of the outer world for it to act like a reasonable being. The famous case of Laura Bridgman, as well as that of Meystre, and some others less known, are memorable examples of what a very skilful and patient education may do in awaking the dormant activity of the mind when the principal channels of sense are cut off.

Laura Bridgman lost her sight and hearing at the age of two years; the sense of smell was at the same time almost destroyed, and that of taste much blunted. She had suffered from fits in infancy, but seemingly without injury to her mental faculties. Meystre was blind and deaf. They were both taught the finger-language, and Meystre was even taught to speak a little. Idiocy by deprivation is like a seed which does not sprout because it is kept away from sunlight and moisture, while incurable idiocy is like a seed in which the germinal faculty has been destroyed; and the higher grades of idiocy resemble seeds in which the germinal capacity is much impaired, and the growth enfeebled, so that they require unusual stimulants. I have met with several cases of idiots who were deaf; with others who were blind, or nearly so; and either of these deficiencies, of course, when com-

bined with mental torpor, is a very serious bar to instruction. In a child of ordinary capacity, deafness is a much greater obstacle to instruction than blindness; but it may admit of some doubt whether this is the case with idiots, at least with idiots of the lower grade, where the power of seizing abstract ideas is deficient, and who often are unable to learn more of the outward world than is gained from observing its more superficial phenomena.

Kaspar Hauser, who appeared suddenly on the 26th of May 1828 at the Halle gate of Nuremberg, at first resembled an idiot in many things, but rapidly improved under judicious instruction. It appeared, from the explanations which he was able afterwards to give, that he had been shut up since early childhood in a small cellar, neither seeing the light nor hearing any one speak. It turned out, however, that he had some faint recollections of a happier life, and remembered a few Hungarian words. He was murdered on the 14th of December 1833, probably by some one who wished the secret of his origin to remain undiscovered. It may be noticed that the truth of his singular story has been questioned—as far as I can judge, on insufficient grounds.

Eschricht, a Danish physiologist, brought forward the theory that Kaspar Hauser was a case of cure from idiocy—a notion easily refuted by his old preceptor Daumer.<sup>1</sup>

There are a number of accounts of children who have been carried away by wolves, monkeys, or other wild animals, or who were caught straying in the woods. Many of these are perhaps as little worthy of credit as the story of Romulus and Remus; others are strongly attested, and seem to be true, though the details are perhaps heightened by the desire of exciting wonder or horror. In some of these cases it appears that the suggestive education which had been given to the brutish propensities had so overpowered the intellectual faculties, that these unfortunate beings remained in a state partaking of imbecility or insanity for years after, and in some cases for life. They disliked clothes, were dirty in their habits, fed like brutes, and used few words, or could scarcely be brought to speak at all.

I have only to add at present, that in trying to reduce all cases of idiocy which I have seen to these ten classes, I do not imagine that this arrangement will be found final. The sure advance of pathology must lead to changes in nosology, and the Protean forms of disease now and then present groups of symptoms for which the mind has prepared no satisfactory class. New divisions might even be anticipated, were I not averse to the premature fabrication of classes and names. The term choreic idiocy is not unfrequently used; but though chorea is not rare as a complication with idiocy, I have seen no case where it could with truth be put down in a causal connexion.

<sup>1</sup> Enthüllungen über Kaspar Hauser, von E. Fr. Daumer. Frankfurt, 1859.