Abnormal Development of Scalp. By T. W. McDOWALL, M.D., and COLIN McDOWALL, M.D.

IN 1893 one of us published an account of an unusual condition of the scalp. He believed that the abnormality had not previously been described. In this opinion, however, he was mistaken, for as far back as 1884 Poggi had recorded a case. Since attention was first directed to the matter a few writers, English and foreign, have published cases and ventured on various but conflicting opinions in explanation of the facts observed. The last known contributor is Dr. Eugenio Bravetta, who communicated a paper to the Medico-Chirurgical Society of Pavia in 1910. It contains an account of three typical examples, and is useful in giving a list of published cases with their authors; but it is specially valuable because it epitomises the views of the various writers. As this communication of Dr. Bravetta is in Italian, a language not read by the majority of us, we venture to give, by way of introduction, a free translation and abstract.

As already mentioned, Poggi recorded the first case in 1884, and a translation of the short paper was published in the *Journal of Mental Science*, 1893. Poggi explained the condition by stating that "with the arrest of development of the back of the head, the skin, continuing to develop normally, becomes folded on itself by not being normally stretched."

The hypothesis of Poggi (partly shared by Besta, who, in attempting to support it, asserts that the folds are sometimes of recent formation) is based on two rather doubtful facts: on the platicephalia which should be met with in every case of furrowed scalp, and on the reduction of the scalp which, after having developed normally, becomes folded on itself in consequence of the platicephalia.

To these statements Paravicini has replied, showing (1) that the platicephalia may or may not be present; (2) that the furrows in question are found as often in the parieto-occipital region as in the fronto-parietal; (3) failing the platicephalia Poggi's explanation fails also; (4) that the furrows of the scalp are a continuation of the furrows which traverse the skin of the forehead, and that such furrows, being found chiefly in

https://doi.org/10.1192/bjp.58.242.398 Published online by Cambridge University Press

degenerates, and being common to many mammals (dogs, cats, etc.), should be placed amongst ancestral characteristics.

As already mentioned, the first case of anomalous folds of the scalp is that reported by Poggi, who had noticed in a lypemaniac the presence of "numerous and deep furrows running in curved lines with the concavity superiorly, produced by large raised folds of the skin in the occipital region and arranged with a certain amount of symmetry round a straight central furrow running antero-posteriorly." Subsequently he reported other similar well-marked cases. Whereas in his first paper he maintained that the condition was due to hypertrophy of the scalp, in his second he believed that it was caused by arrested development of the posterior cranium. Amadei discussed Poggi's communication and suggested that the cases might be instances of ordinary elephantiasis.

Lombroso observed in an assassin of twenty, two abnormal furrows of such depth as to resemble incisions, parallel, oblique, in the left frontal eminence; and in a cretin thief, one furrow which cut the arch of the right eyebrow almost vertically.

A very full abstract of the case reported by one of us in 1893 is given by Dr. Bravetta, but it is not necessary to repeat this as the original paper is easily accessible, as is also the paper by Cowan, who in the same year published the particulars of two cases.

Middlemass and Ford Robertson looked for similar cases, but failed, but afterwards Robertson observed three, slightly marked, after death.

Paravicini, in 1902, described two cases, one a microcephalic idiot, the other an imbecile with numerous signs of degeneration. The latter exhibited a specially interesting condition. Vertically and along the middle line of the fronto-parietal region were four very deep fissures running from front to back. The two meso-inferior ones began a little above the root of the nose and were prolonged right up into the scalp. In the occipito-parietal region the folds were much thicker, and separated by six deep fissures arranged vertically and parallel. The skin was not thickened, and even in the deepest parts was perfectly movable on the underlying epicranium. Dr. Paravicini made a microscopic examination of the skin during life and found it histologically normal. In answer to this article Lombroso expressed the opinion that these folds might be the

https://doi.org/10.1192/bjp.58.242.398 Published online by Cambridge University Press

continuation of those so frequently met with in the face and neck of lunatics, often congenital, due to myxœdema.

Besta observed furrows in the scalp in two microcephalic idiot brothers, and accepted Poggi's pathogenetic explanation of them.

More recently Paravicini reported four cases, and at the same time discussed and fully illustrated their pathogenesis.

Gatti has described two cases, one a sub-microcephalic idiot, the other a person suffering from manic-depressive insanity. In the former case it was noteworthy that although the scalp was not very movable on the cranium, yet during frowning the skin of the frontal and parietal regions, as far as the lambdoidal region, took part in the movement by becoming corrugated; and the external ear was endowed with mobility in an antero-posterior direction.

Finally Bravetta has described three cases with illustrations. They present the usual characteristics, but the following special features may be noted:

His first case was a paralytic idiot, æt. 16, aphasic, helpless, degraded, with numerous marks of degeneration. The head was brachycephalic. The furrows in the occipital and parietal regions were of the usual character. The occiput was not flattened. It is stated that the furrows appeared gradually a few months after the patient had meningitis.

His second case was a man, æt. 34, of bad heredity and wicked from his youth; had often been convicted of various offences, was drunken, syphilitic and pediastric. In the asylum he was found to be deficient intellectually and morally. The usual furrows were found in the occipital region. In making remarks about this case Bravetta says that it is evident that the furrows may be present sometimes in the occipital region, sometimes in the fronto-parietal, or in both simultaneously. Occipital platicephalia may be absent, and is so as a rule in the fronto-parietal region. Finally the structure of the skin does not differ from the normal, and the furrows are not adherent to the skull.

Paravicini, Lombroso and Gatti assert that the furrows of the scalp are of the same character as those of the forehead, of which they are merely extensions. Bravetta thinks that the case of the imbecile described by Paravicini and recorded by himself is conclusive proof of this. Besides, his researches have

https://doi.org/10.1192/bjp.58.242.398 Published online by Cambridge University Press

enabled him to strengthen Paravicini's statement with other cases of direct continuity on the frontal furrows with those of the fronto-parietal region. Normally, as we all know, the forehead is crossed by furrows running transversely, parallel, and some subparallel, due to the contraction of the frontal muscles; but sometimes it shows vertical furrows corresponding to the glabella, and becoming more marked during the effort of attention. The examination of many patients by Bravetta has satisfied him that in the mentally afflicted we fairly frequently find furrows less deeply marked than those described, but still evident enough. Such furrows start from the root of the nose or upper margin of the eyebrow, and always run laterally, terminating sub-parallelly to Zoia's cranial furrows. These furrows are often short and found singly to right or left; in some cases they are long and numerous and may extend beyond the hair-line right up to the occipital region.

The third case reported by Bravetta illustrates this point—a better class patient, æt. 68, syphilitic, chronic alcoholic, now demented. Attention is at once drawn to the wrinkled appearance of the face. The cheeks present a very deep furrow like a wound, arranged as a semicircle with the concavity touching the labial angle. Various furrows arranged like a fan converge in front of the tragus. The forehead is ploughed across its whole breadth by two principal, parallel furrows, but above and below them there are others less deep and shorter, amongst which may be specially mentioned two superciliary furrows. The scalp has six long furrows, specially marked on the right side, in all respects similar to the frontal ones, running antero-posteriorly and parallel. The two external furrows begin at the top of the superciliary furrow, cutting across the frontal furrows, and proceeding as far as the occiput. The other four furrows begin each a little higher than the other, almost like steps, and also end in the upper occipital region. During frowning the furrows of the scalp became more marked.

In reviewing this case Bravetta makes some important remarks, and says that it is evident that, besides the deep furrows, we frequently find less well marked ones, which, beginning at the lower limit of the brow, invade the fronto-parietal region and end in the occipital region. This is an important fact, because the presence of the fronto-occipital furrows prove that besides the transverse frontal furrows, there

https://doi.org/10.1192/bjp.58.242.398 Published online by Cambridge University Press

exists a system of furrows in an antero-posterior direction which in some exceptional cases seem to be continuous. These furrows correspond to those found by Paravicini in animals possessing great mobility of the external ear, although in man they no longer have any function.

Bravetta is further of opinion that the furrows described by Poggi, McDowall, Cowan, Paravicini, Besta, Gatti and himself, and found in degenerates (idiots, microcephalics, imbeciles, maniacs, criminals), are only the continuations and exaggerations of the frontal furrows; and that they are found in some animals (dogs, cats, lions, monkeys), where they are produced by the contraction of the supra-auricular muscles, and in man constitute an indication of advanced degeneration and atavistic reversion.

We will now describe the case at present in Cheddleton Asylum. The man is a microcephalic epileptic imbecile, æt. 33, and has an insane sister in the asylum. He is in good bodily health, and able to be employed in barrow work. He is somewhat stunted in stature. He is tidy in his habits, and has enough intelligence to express his wants and wishes. The forehead is "beetle-browed," very hairy, and the ordinary transverse corrugations of the skin are well marked. The circumference of the head is only 22½ in., the coronal arch 10½ in., and from the glabella to the occipital protuberance 12½ in. The arrangement of the furrows is as follows: On the left side ½ in. to the left of the middle line there is a furrow 7½ in. long, commencing in front at the coronal suture and extending backwards to the occiput. It is deeper in the middle, about ¼ in., than at the beginning. It can just be made out without manual pressure, but it is lost at its extremities when this is removed. Another furrow is seen, but only when slight lateral pressure is applied, ½ in. to the left of the furrow just described. It is 3½ in. in length, and parallel to the first. External to the above two furrows and parallel with them is a third smaller, only 2½ in. in length and about ⅛ in. in depth. It begins about ¾ in. behind the frontal suture. The formation of the skin on the right side is almost identical with that on the left, but the first long furrow is subdivided in the middle and the third furrow is not so well seen. When the head is viewed from the back an unusual feature is evident: this is a deep central spot occupying the apex of the vertex, and the two long furrows,

https://doi.org/10.1192/bjp.58.242.398 Published online by Cambridge University Press



To illustrate Dr. T. W. McDowall's and Dr. Colin McDowall's paper.

Adlard & Son, Impr.

https://doi.org/10.1192/bjp.58.242.398 Published online by Cambridge University Press

right and left, finish on each side of it. To the right of this spot a short but deep furrow runs forwards. In the photograph there is a scar to the right of this furrow. It may be added that at the back of the head the furrowing is better seen than on the top. Such a detailed description is really unnecessary, as a glance at the photographs at once shows the arrangement of the lines, and at the same time demonstrates the striking similarity existing in all the published cases.

There are at present four men in Morpeth Asylum who have corrugated scalps. Three are of the usual character, in congenital idiots, but the fourth occurs in an adolescent dement, in whom the rugæ are not well marked.

In passing from this part of the subject we may mention that there is another somewhat similar case at present in Cheddleton Asylum, and it is of special interest, that it is the first case observed in a woman. So far as we know no search for the condition has ever been made in females; and the ordinary arrangement of the hair in women would completely conceal it.

Two questions are naturally suggested by the study of these cases: on what do these abnormalities depend? and what significance should be attached to them?

Before publishing the case in 1893 several distinguished men at home and abroad were consulted, but they all confessed that the condition was quite unknown to them. Professor Kaposi, of Vienna, said—"Because the contents to be surrounded remained too small, the normally larger skin was forced to arrange itself in folds over the small skull, and in parts became atypic, *i.e.*, hypertrophied during development. I fancy, too, that the folds chiefly correspond with the cleavage of the skin (Langer's lines)."

In this opinion Professor Kundrat agreed. These lines are but little known in Britain; they are not mentioned in any text-book of anatomy, and even distinguished anatomists admit that they possess but faint ideas as to what those lines of cleavage are; yet it would appear that a study of these lines furnishes the clue to the interpretation of what we are considering, and we will, therefore, give a brief epitome of Langer's observations, which appeared so long ago as 1861 in the transactions of the Kaiserlichen Akademi der Wissenshaften of Vienna.

In introducing his subject Langer remarked that Dupuytren observed that a round awl stuck into the skin did not make a

https://doi.org/10.1192/bjp.58.242.398 Published online by Cambridge University Press

round puncture, but a linear fissure. He made this discovery on a young man, who, with suicidal intent, inflicted three stabs in the cardiac region. The doubt whether the wounds were really, as the patient maintained, made with a round awl, or with a penknife, led to some experiments being made on the dead body. Dupuytren at once found that the prick-fissures in different parts of the body differ in direction, and that they can be diminished or widened according to the direction of artificial stretching. It was therefore evident that the insertion of an awl produced only a separation of the fibres of the skin.

Malgaigne recognised the value of this observation, and investigated the subject without discovering a general law as to the direction of the fibres. Lastly he discussed the importance the knowledge of the skin-texture has in practical surgery, noticed the distortion of wounds of the skin, and convinced himself as an operator on the living of the varying amount of retraction according to the direction of the incision.

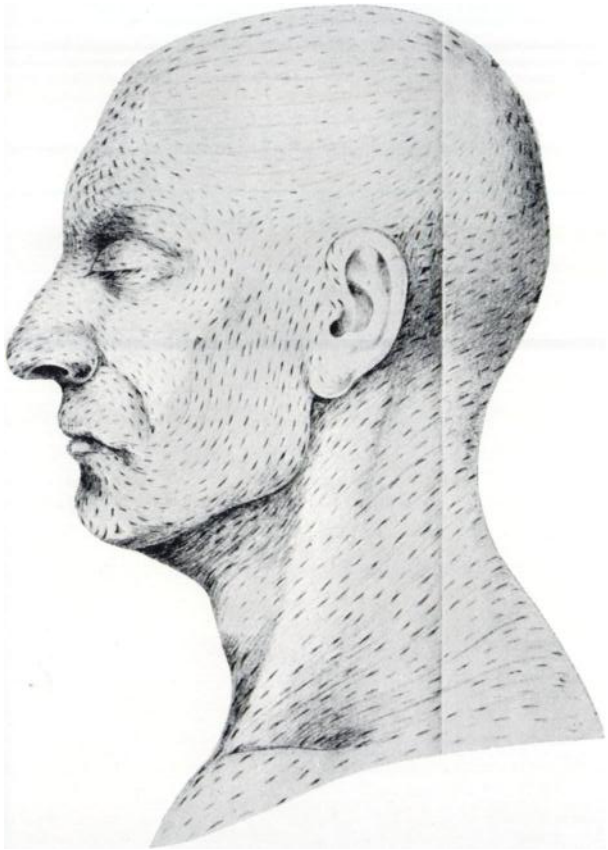
The subject appeared so important to Langer that he conducted exhaustive researches. He started with the assumption that the fissures, made as close together as possible in the various parts of the body, would have a fixed mutual relation; and that it would be possible to group the fissures in lines and areas which would be correlated in a manner similar to what was known about the hair. The lines should represent the direction of the skin-fibre, and should afford many explanations, not only of the texture, but of the development of the skin. Langer found that the very first of his experiments confirmed his assumptions.

His researches were continued on a great many bodies of different ages and conditions, but as to the details of the manipulations it is not necessary to enlarge. There are, however, one or two important sentences which must not be omitted. Bodies of fat children gave the best and simplest results, although the direction of the fissures on many parts of the body differed from that found in adults.

In order to discover the relation of the fissures to the arrangement of the web, Langer examined many pieces of human skin under the microscope, these having previously been abundantly pricked through on the body. A section from the upper and anterior part of the thigh showed the fibres under the papillæ

https://doi.org/10.1192/bjp.58.242.398 Published online by Cambridge University Press

https://doi.org/10.1192/bjp.58.242.398 Published online by Cambridge University Press





To illustrate Dr. T. W. McDowall's and Dr. Colin McDowall's paper.

in the form of a trellis work, arranged in very elongated rhomboidal meshes. The fibres were very close together and interlaced. The longitudinal diameters of the meshes were all in the direction of the prick-fissures. Similar sections from the front of the scalp, where the prick-fissures are well defined and directed towards the vertex, showed the same arrangement of the corium fibres.

The microscopic examination clearly showed that the direction of the cleavage of the corium depends on the direction of the fibres; and that the prick-fissures are nothing else than the widening of the meshes of the corium.

The fibres are not always arranged parallel on all parts of the body, for one occasionally finds fissure rows which are crossed more at right angles, so that the regular and uniform fissuring is lost.

Whilst Langer constantly observed on certain parts of the body the same arrangement of fissures, *e.g.*, on the joints, face, back, etc., other areas showed many variations.

Great importance seems to be attached to the variations found in embryos. The direction of the fissures differs in many places so essentially and constantly from that observed in adults that they must be regarded as the form of development and growth.

In giving a few of the details of some of the groups of fibres it is necessary to refer to the drawings made by Langer, and of these two photographic reproductions are shown—one of an adult, the other of a child. It was found that the bodies of infants were most suitable as standards because they gave more regular fissures, and the soft underlying bones presented no obstacle in making the punctures perpendicularly.

In the skin of the head and face the following groups of fissure-rows appear. The obliquely descending fissure-rows of the nape of the neck maintain the same direction at the back of the head above the linea nuchæ superior, and, as is clearly seen in the figure of the child, proceed to the pinna of the ear, and split into two directions at the mastoid process; one goes under the pinna to the upper region of the hyoid, the other above the ear to the temple.

The lines of cleavage round the eye correspond in direction to the fibres of the orbicularis muscle; in the middle of the eyebrow the lines rise towards the forehead.

https://doi.org/10.1192/bjp.58.242.398 Published online by Cambridge University Press

The vertex is the centre towards which all the lines of cleavage run ; the longest are those which come from the forehead ; the shortest and most variable are those from the back of the head. At the base of the occiput these radiating lines are intersected by a circular band which passes from the back of the head across the temple to the forehead.

In the individual regions the following arrangements occur. On the vault of the skull the glabella shows a fan at the root of the nose, of which the base lies between the eyebrows ; on the forehead, on the frontal eminence, there is a broad band of cross fissures, which are frequently intersected by the rows ascending from the glabella. The cleavability in the adult is very uncertain ; the fissures sometimes run transversely, sometimes upwards, and are frequently quite irregular.

On the front part of the scalp the fissures of the forehead run closer together, converging rather towards the middle, but further out run almost parallel to the middle line, and at the temples obliquely upwards to the vertex.

On the upper corner of the occiput the fissures run in the direction of the vertex ; lower down they are more irregular.

To enter into more minute anatomical detail would prove wearisome, and probably obscure the main point which we desire to make clear, *viz.*, that it is by a study of Langer's lines that we will in the end succeed in understanding the curious abnormality that we are considering. For fuller and sometimes most perplexing details I refer to Langer's original paper—a record of most patient and persevering work conveyed in unusually involved German. Enough has been given to show that all the unusual furrows of the scalp, so elaborately described by English and foreign writers, are represented in the arrangements of the corium at some period of development.

All writers on these furrows have evidently believed that they are of extremely rare occurrence. That is true in a sense but is fundamentally incorrect, for if we examine carefully the scalps and foreheads of ordinary people we can demonstrate all the furrows in an elementary condition. Some of the lines described by Lombroso and others as cutting across the forehead vertically are visible on close inspection, and can be at once demonstrated by slight pressure at the temples towards the middle line. The same can be done in the fronto-parietal region, and even in the occipital region, though, as a rule, with

https://doi.org/10.1192/bjp.58.242.398 Published online by Cambridge University Press

more difficulty. The breadth of the furrows so demonstrated appears to depend on the thickness of the skin—the thicker the skin the broader the furrows. Another factor which has some influence in the artificial production of these furrows is the amount of movement possible between the scalp and the subjacent structures. This varies to a degree probably not known by most of us.

If we are to judge from the cases hitherto recorded it seems evident that in the majority the skull was abnormally small; and the scalp appeared to be too voluminous for what it had to enclose. Therefore we feel inclined to agree with the opinion of Professors Kundrat and Kaposi that "the brain had not advanced in growth, but the skin was sufficient for a normal skull, and had developed independently in accordance with its own capacity for growth. But because the contents to be surrounded remained too small, the normally large skin was forced to arrange itself in folds over the small skull, and in parts became atypical, *i.e.*, hypertrophied during development." It cannot be denied than in some cases the skull is of normal dimensions and yet the scalp presents well-marked furrows. In such cases we can believe that a genuine hypertrophy of the skin alone occurred. The last word has not been said about this matter, and we confess to feeling dismayed at the fields of knowledge which must be explored before the subject can be thoroughly understood.

Some Dreams and their Significance.[1] By Sir GEORGE H. SAVAGE, M.D.

GENTLEMEN, According to promise, I shall give you a short paper on a subject which at first sight may not seem to have a very practical value, but I hope to be able to show you that the land of dreams may provide something both of interest to the physician and to the philosopher.

I have chosen the title of "Some Dreams and their Significance." Some of you may know already that I have always been a dreamer myself and that I no sooner close my eyes than I pass into dreamland. This has directed my interest to conditions of dreams in the healthy and in the disordered.

https://doi.org/10.1192/bjp.58.242.398 Published online by Cambridge University Press