

"Now, in respect to the locality of the power of speech. It has been said that the loss of brain power to express ideas in speech was located in a certain part of the brain. This affection is called aphonia or aphasia. There are three modes of expressing ideas—by speech, by gesture, and by writing. It is with the first only that we are concerned. Some very bold theorists have tried to locate all these powers in a particular part of the brain. Let us confine ourselves to facts. Dr. Broca of Paris has advanced the view that a certain small portion of some of the convolutions of the brain holds the power of speech. I admit that facts seemed to favour this view. But we find that there is no relation between the degree of aphasia and the extent of the disease of that part, and there are cases where the destruction of those convolutions is very great, and the injury to speech very little. Secondly, we find that disease may have overtaken the anterior, the posterior, and the middle lobes of the brain, the particular convolution supposed to involve speech not being affected, and yet there is marked aphasia. Now, is some one of these lobes the locality of the power of speech? Such would be the reasoning of my opponents. We should be obliged to concede that in some persons the faculty of speech existed in one part of the brain, in some in another, in others another, and so on *ad infinitum*. This is a *reductio ad absurdum*.

"There is the case of the paralysis of the insane, where the grey matter may be diseased on both sides of the brain. In these cases the power of speech does not seem to be involved. There are cases of aphasia where the diseased person has had the power of speech restored during delirium. The speech is coherent though the sense may not be. It is evident, then, that the faculty of speech is not actually lost in such cases; and yet we find that the third frontal convolution is actually diseased in those aphasiacs who talk in their delirium. But the most decisive argument is found in the cases that I have seen, where the third frontal convolution, the alleged organ of speech, has been destroyed, and yet the patients have not lost the power of speech. Therefore the theory is itself destroyed. There are fifty cases on record to show that the question of right-handedness or left-handedness does not apply in the considerations." The lecturer here cited cases of Jacmet of Montpellier and Mr. Prescott-Hewitt of London. In the latter case the patient had suffered a destruction of that part of the brain for twenty years, and yet for twenty years had spoken.

"We shall now take up the question of the localisation of motion in certain parts of the brain. I am surprised at the avidity with which a certain series of facts has been accepted as proof of this theory in England. A very eminent man, of whom I should not like to say anything severe, my friend Prof. Carpenter, has accepted those views. I may say that all England has accepted them. Prof. Huxley, indeed, has written me, that he only accepted this view in part, but I cannot see how he can accept a part without accepting the whole, where even the part is incorrect. The famous experiments of Dr. Ferrier, of Guy's Hospital, must here be considered. As you will see, they are not, however, conclusive. By the application of galvanism to certain parts of the brain of animals, he produced certain movements. When we do not stop to think, this would seem to prove that there are in the brain certain centres of movement governing certain parts. But it is only a semblance. A part of the facts are taken for the whole. We should know all the series before we adopt the conclusions. Let us examine the other facts.

"It is perfectly well known that the cutting away of a large portion of the brain does not produce the least alteration of voluntary movement any where. Suppose that part of the brain, say the anterior lobe, being excited by galvanism, produces a movement in the anterior limb; now suppose that part of the brain is cut away, then the

anterior limb should be paralysed, for its voluntary movement is gone. Admitting that the other half of the brain should supply the place of the missing part, let us take that away also; then certainly there should be a paralysis of the anterior limbs. But there is not. This should be sufficient to invalidate the conclusions of Dr. Ferrier. But there are abundant pathological facts of this nature proving the fact beyond question. And then there are the cases of recovery from paralysis. There is no such localisation of power as Dr. Ferrier has assumed. If galvanism be applied to the severed leg of the frog the leg will jump although there is no brain power in the question.

"What should have been done was to have cut the connection of parts, so that a general effect should not have been propagated throughout the brain by the application of galvanism to a part. This would be the *experimentum crucis*. My friend Dr. Dupré of Paris has made this experiment. I made it also, before he did, but he published his before mine. But there are many other facts almost equally impressive in their character which may be cited. We find many cases where the lesion of part of the brain produces paralysis on the same side of the body, and not on the opposite side, as in the majority of cases is the rule. There is a case recorded where a ball passed directly through the brain, and it produced paralysis on the right side, instead of the corresponding side." Here Dr. Brown-Séquard objected to having a certain class of brain affections named after him, stating that diseases should be named from their distinctive features, and not after physicians.

Dr. Brown-Séquard then applied a similar course of reasoning to the localisation of sensation in specific parts of the brain, concluding by stating that it is evident we cannot locate the centres of either sensation or motion in specific parts of the nervous system.

THE LONG PERUVIAN SKULL

I WISH to place before comparative anatomists and anthropologists a question which has been encumbered by some misleading inaccuracies, in a recent communication by Dr. J. Barnard Davis to the Anthropological Institute, ("On Ancient Peruvian Skulls" Journ. Anthropol. Inst., vol. iii, p. 94). So early as 1857, in communications to the British Association, and to the American Association for the Advancement of Science, I showed, in opposition to the views of Dr. Morton, and of all American ethnologists up to that date, that a dolichocephalic type of head is characteristic of certain widely diffused American races. At a later date I set forth, in "Prehistoric Man," my reasons for believing that this, which is now universally acknowledged as true in general, may be specifically asserted of the ancient Peruvians. This latter proposition Dr. Davis undertakes to refute; it is not a mere matter of personal controversy, but a question of some ethnical significance. As a Canadian, I lie outside of the charmed circles of home science and criticism, and only receive tardy news even of such communications as this, in which I have a personal interest.

Dr. Davis has not himself had an opportunity of examining the evidence on which my opinion was formed; and, in the communication above referred to, shows that he fails to appreciate its nature or true bearing. He says, Dr. Wilson's view, "which is that the dolichocephalic Peruvian skulls are of natural form, was combated in the 'Thesaurus Craniorum.' Since that book was printed, I have received ample and satisfactory evidence as to the truth of the proposition that the long skulls owe their quality to artificial means. By the politeness of Dr. J. Aitken Meigs, of Philadelphia, I have obtained two Peruvian skulls which at one period belonged to Dr. Morton's collection, as a specimen of each kind. One of

these is brachycephalic, the other is dolichocephalic, but they both present distinct traces of artificial distortion. *This fact is conclusive.*" So says Dr. Davis. But conclusive of what? So far as I can see, it is simply conclusive as to the fact that both skulls have been artificially distorted. He then quotes Professor Wymann, of Boston, who, after an examination of the specimens referred to by me, settles the question thus summarily: "The upshot of the whole is, the crania do not confirm Dr. Wilson's statement. One of Dr. Wilson's points—in fact it is his chief point—is, that *skulls are natural because they are symmetrical*; and that it is next to impossible that a distorted skull should be other than unsymmetrical."

The thing I find most conclusive in all this is, that Dr. Davis and his correspondent both accredit me with inferences or opinions of their own, utterly inconsistent with my published views. So far am I from affirming "skulls are natural because they are symmetrical," that when my two critics have leisure to extend their reading to pp. 500-512 of the volume they refer to ("Prehistoric Man"), they will find many natural causes specified as tending to modify and distort the human skull. They will also find in the notes reference to papers in the *Canadian Journal*, and elsewhere, in which various aspects of this question have been repeatedly discussed. Dr. Davis has, I believe, received copies of all of those from myself; but, at any rate, there is one which can scarcely have escaped his attention—"On the Physical Characteristics of the Ancient and Modern Celt." It was published in the *Canadian Journal* in 1864, reprinted in the *Anthropological Journal* soon after, and became the subject of a good deal of reference in the famous copyright action of "Pike vs. Nicholas." In this the explicit statement is repeated: "The normal human head may be assumed to present a perfect correspondence in its two hemispheres; but very slight investigation will suffice to convince the observer that *few living examples satisfy the requirements of such a theoretical standard.* Not only is inequality in the two sides of frequent occurrence, but a *perfectly symmetrical head is the exception rather than the rule.*" There is no possibility of mistaking the opinion thus expressed. It was published by me so long ago as 1862 (*Can. Journ.* vii. 414), and is repeated in substance in the very work from which Drs. Davis and Wymann profess to derive their absolutely contradictory dictum as "one of Dr. Wilson's points—in fact his chief point!"

But over and above all this, in the previous paper results derived from a careful study of eleven hundred and four English and French head-forms are set forth with this conclusion: "It thus appears that the tendency to unsymmetrical deformity is nearly as three to one; and that in the abnormal head the tendency towards excess of development towards the left is upwards of two to one." This tendency, it is further added, is more decidedly manifest in the brachycephalic than in the dolichocephalic head (*vid. Anthropol. Journ.* vol. iii. p. 82). The views thus repeatedly set forth, and supported by such proofs, are certainly not open to any charge of ambiguity. It is somewhat amusing, therefore, to find two such high authorities as Dr. Davis and his Boston correspondent summarising the whole, in this off-hand fashion, in a communication to a scientific body: "The upshot of the whole is," that, according to Dr. Wilson, "the skulls are natural because they are symmetrical, and that it is next to impossible that a distorted skull should be other than unsymmetrical."

By what process such opinions have been arrived at, and then accredited to me, I need not attempt to guess; but one thing unaccountably overlooked is the distinction on which I insist, between undesigned natural deformation, traceable to such simple causes as the one-sided pressure of the mother's breast, of the cradle-board, &c.,

and purposed modifications of the head, such as those practised at the present day among the Flatheads on the Columbia river. Three points on which I have insisted, not without evidence in their support, are: That the shape of the human head may not only be designedly altered by artificial means; but that it is much more frequently modified undesignedly, and rendered strikingly unsymmetrical, in infancy; while a third source, that of posthumous distortion, has also to be kept in view.

So far as to the general question. The specific one sought to be determined is the universality of a brachycephalic Peruvian type of head; or, as I have asserted, the occurrence of well-defined dolichocephalic heads in ancient Peruvian cemeteries. Dr. Davis informs the Anthropological Institute that my view was combated by him in his "Thesaurus Craniorum" (1867), and indeed it is with a view to the substantiation of "the criticisms of Dr. Wilson's statements in the 'Thesaurus,'" p. 246, that Dr. Wymann's "upshot of the whole" is produced. As one of the subscribers to Dr. Davis's valuable Catalogue, as well as a contributor to his collection of crania, I am familiar with the work, and with the pages specially set apart for my correction. I have had it, indeed, for years in my possession, without thinking that it needed refutation. I recommend any readers interested in the question to turn to the aforesaid p. 246, and read the curious narrative of Dr. Davis's conversion, in consequence of the receipt of a "skull next to unique in Europe," which belongs to "the long-headed race" of Peruvians, but yet is decidedly not long, or only long-headed "in a conventional sense," whatever that may mean.

I still believe it to be a fact, confirmed by my examination of examples referred to, that there is a well-defined dolichocephalic type of Peruvian cranium, although a brachycephalic type is the prevalent one. I have on three different occasions visited Philadelphia with the express object of studying the Morton collection there. One result has been to lead me to form a clear idea as to the source of Dr. Morton's later views. He had asserted the predominance of one uniform cranial type throughout the New World. "The long-headed Peruvians" were a disturbing element in this otherwise universal law. When therefore he turned to the examples in his own collection, and detected evidence of malformation by art in skulls which he had previously recognised as exceptions to his comprehensive theory, he welcomed the conclusion it suggested to his mind "that all these variously formed heads were originally of the same rounded shape." Dr. Davis informs us that he has obtained two Peruvian skulls formerly in Dr. Morton's collection, "a specimen of each kind" *i.e.* I presume, an occipitally flattened, and an elongated skull, both of the prevalent brachycephalic type. He has also the Titicaca skull already referred to, long, and yet not long, except "in a conventional sense." Possibly both Dr. Morton's and Dr. Davis's views are correct deductions from such premisses.

If a skull of the brachycephalic type, common to many American tribes (such as the Peruvian skull figured by Prof. Busk, vol. iii. pl. 7, "Journ. Anthropol. Inst."), is subjected to extreme depression of the frontal bone, with corresponding affection of the parieto-occipital region by the action of the cradle-board, such a form results as is shown in Fig. 78, p. 245, of Dr. Davis's "Thesaurus Craniorum." Examples of this are not rare. Here, if the length is measured from the projecting base of the frontal bone, immediately above the nasal suture, to the extreme posterior point, that will fall, not on the occipital bone, but nearly mid-way between the lambdoidal and coronal sutures. Such a measurement is the actual extreme length of the modified skull; but if it is accepted as the true longitudinal diameter, without reference to the displacement of the points of measurement in the normal head, it is manifestly deceptive. It is, in fact, nearly equivalent to the substitution of the diagonal of a

square for a diameter drawn parallel to its two sides. Such a skull, notwithstanding its actual length by measurement, is properly classed as brachycephalic. But take such a form as that which I have designated a "Peruvian dolichocephalic skull" ("Prehist. Man," 2nd ed. Fig. 50, p. 449). It is reproduced here; Fig. 1. Compare it with the above-cited example, in Dr. Davis's collection; or again compare the Peruvian child's dolichocephalic skull ("Prehist. Man," Fig 60, p. 451), also reproduced here, Fig. 3, with another juvenile skull, from the Peruvian cemetery of Santa, but of the brachycephalic type, as shown here, Fig. 2, reduced from Morton's "Crania Americana," pl. vii. The question is

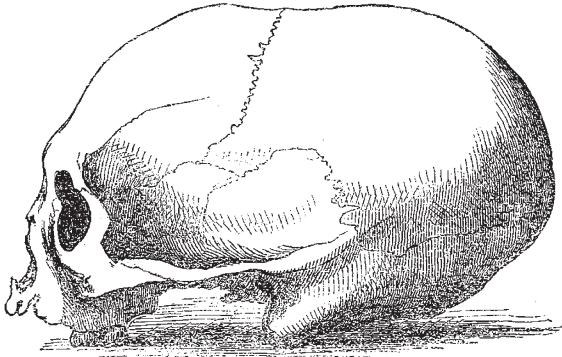


FIG. 1.—Peruvian Dolichocephalic Skull.

not, as Dr. Davis and Dr. Wymann would have it, whether the one is in its natural state, and the other artificially elongated? but whether it would be possible, by any elongation of the one, or abbreviation of the other, to reduce them to the same form? Compare the juvenile skull, Fig. 3, which is little, and probably not at all designedly, affected by art, with another of the same type, but purposely deformed by artificial means, Fig. 4. The same form is traceable in both, notwithstanding the modification of art. Both I conceive to be of the true dolichocephalic type; in contrast to the Santa skull, Fig. 2, which, whether or not affected by the parieto-occipital flattening so commonly resulting from the cradle-

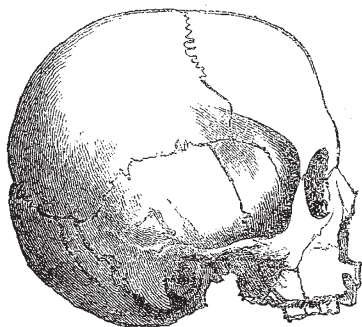


FIG. 2.—Peruvian Child's Skull, Santa.

board, is no less obviously of the brachycephalic type; and could not be transformed into the other.

The primary form of the skull, as determined, for example, by the relative proportion of the parietal bones, remains a factor to the last, however extreme may be the modifications superinduced by art. Only in the case of premature ossification of the sutures, consequent on the pressure applied in one direction, can this fail; though, no doubt in two approximate head-forms, the one only slightly dolichocephalic, and the other equally slightly brachycephalic, the original distinctive characteristics may escape observation in the modified skulls.

The question, then, turns mainly on this point—strangely ignored by Dr. Davis and his correspondent,—that a dolichocephalic and a brachycephalic skull are equally susceptible of distortion; but the same compression applied to the two types will beget different results;—will not, in any strongly marked example of either type, wholly efface the original character;—could not transform such a dolichocephalic skull as Fig. 1, into anything analogous to the elongated brachycephalic skull, Fig. 78, of Dr. Davis's "Thesaurus."

I have necessarily left untouched various collateral points, for want of space; but enough has been said to show that what strikes Dr. Wymann as so "curious," and manifestly in his estimation so "conclusive" against me,

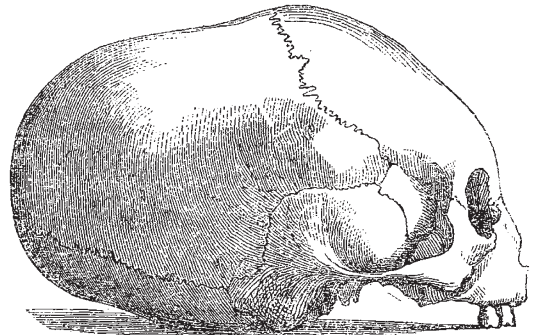


FIG. 3.—Peruvian Child's Skull, Normal.

in the projection of the occiput farther on the left than on the right side, is a feature I am very familiar with, in skulls which I should still call "natural," as distinguished from those designedly modified by art.

I shall refer only to two marked examples of this irregularity, in proof of such unsymmetrical forms existing among races in no way given to artificial cranial distortion. The first—a brachycephalic one—is "the skull of a young Greek," No. 1,354 of the Morton collection; a cast presented by Retzius. Dr. J. A. Meigs describes it minutely in his catalogue, p. 29, but takes no notice of its symmetry; although when viewed vertically it resembles some of the distorted Flathead skulls. The



FIG. 4.—Peruvian Child's Skull, Abnormal.

second—a dolichocephalic skull—Dr. Wymann will find alongside of the Peruvian skulls, No. 15 in the Warren Collection at Boston. It is that of a "Chinese," or was at any rate brought from China by Capt. Edes. It approximates in malformation to the "Hochbelaga skull," Fig. 67, "Prehist. Man," p. 501, as an example of posthumous distortion. But in this skull from China the sutures are close, with no trace of dislocation or other indications of posthumous modification of forms. Those are extreme examples; but I repeat what I have long ago asserted; that a perfectly symmetrical head is the exception, rather than the rule.

DANIEL WILSON