

tion that the threshold will be lowered, to a fear of making errors, to a reprimand, etc. When such influences are lacking, practise has not been found, in the experience of the author, to lower the threshold, and his results agree in this respect with those of Tawney.

(f) *The Threshold of Double Contact can not be Determined Scientifically.*—For a simplist there is a determinable threshold. But every simplist is a latent interpreter. The determination of the threshold is practically impossible. It varies from moment to moment, and the more one seeks it the less he finds it; and it depends so strictly on the manner of interpreting the sensations, even in the cases where it appears to have a definite position, that one can not be sure that it expresses the degree of acuteness of the organ. Even if all persons had exactly the same degree of sensitivity, apparent differences would appear.

This research is certainly of the greatest value, and no future investigation in æsthesiometry can neglect the facts that it establishes. It seems legitimate, however, to question whether the author's final conclusion is fully justifiable. May it not be possible to make simplists of all one's subjects? To determine the threshold between sensations *B* and *C*, and thus to secure valuable information concerning the relative sensitivity of different regions of the body, of different persons and of the same person at different times and under various conditions?

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Traité des Variations des Os du Crane de l'Homme, et de leur Signification au point de vue de l'Anthropologie Zoologique. Par M. le Dr. LE DOUBLE. 118 Dessins dans le texte. Paris, Vigot Frères. 1903.

A volume of four hundred pages and all on the variations of the cranial bones! Be it noted, moreover, that the word 'cranial' is used in the strict sense, and that, therefore, the facial bones are not included. Ponderous as the work may seem, it is one that will be warmly welcomed by anatomists. It will be of great value not only to those devoted to

human anatomy, but to all interested in vertebrate morphology. We are glad to understand that the author intends to continue the study of the variations of the human skeleton and that we may expect next a treatise on the facial bones. His method is that pursued in his treatise on muscular variations, which is already a classic. Side lights from embryology and comparative anatomy are thrown on the questions, while the various and often contradictory views of authors are discussed. It is natural enough that the size of this work should astonish outsiders; yet even anatomists will be surprised at the number of points of variation which present themselves.

There is no possibility of reviewing such a work in detail; but let us mention a few of the points of interest in a single bone in order to show how extensive is its scope. Let us take the first bone, the occipital. We must take up the story of the development of the squamous portion, the difference between the supra-occipital and the epactal bones, the former of which is that part which develops in membrane, while the latter is merely a wormian bone, or several together. On the outside there is the torus and the very rare median crest. On the inside are the endless varieties of arrangement of the venous sinuses (which the author attempts to classify), the torcular fossa, and the middle cerebellar fossa. Here as elsewhere the author is very severe on Lombroso and his school, who, as is well known, make much of the latter fossa as a criminal feature. He exclaims: "Must we consider Scarpa a madman or a criminal because his occipital, like that of Charlotte Corday, had a vermian fossa? If a defect in the formation of the skull or of the brain is an index of mental inferiority or of a tendency to crime, how happens it that Dante and Pericles had asymmetrical skulls (with great development of the parietal), that Kant had an interparietal bone, Volta a metopic suture, Byron, Humboldt and Meckel premature closure of sutures, and Bichat one hemisphere much smaller than the other?" For our part, while we have no wish to minimize the absurdities that the followers of the school of criminal anthropology have been guilty of,

we think that the strength of their position is that the occurrence of many anomalies in the same individual, and especially the occurrence of multiple anomalies in many members of the same family, may fairly be considered marks of degeneration; that in short there is a core of truth in the system, hampered as it is by errors. This in parenthesis. The author then goes on to discuss the various theories to account for the presence of the fossa. This in turn brings up the significance of Kerkring's ossicle, which Le Double declines to consider as representing a part of the proatlas. Here we are once more in the midst of deep questions of embryology and comparative anatomy, and yet we have not finished the squamous portion alone. Later comes a discussion of how many segments the basi-occipital may represent, and whether a subdivision of the anterior condyloid foramen into two, three or even four, results from anything more abstruse than the quasi-accidental ossification of strands of fibrous tissue. There is, as every one knows, much that is interesting in the condyloid region. We could have wished that more had been said of the fusion of the atlas and occiput, but the consideration of this phenomenon was probably beyond the plan of this volume. We must not forget to mention the interesting peculiarities of the inferior surface of the basi-occipital, nor the minute canals sometimes found in its cerebral side.

This may suffice to give some idea of the thoroughness of the work. We must, however, refer the reader to the question of the variations of the pterion, for it serves as an introduction to the author's views. Referring to the process from the squamous portion of the temporal which occasionally reaches the frontal, he writes as follows: "In accord with Gruber, Calori, Virchow, Broca, etc., and in opposition to Anoutchine, Ranke and Schwalbe, I persist in considering the frontal process of the temporal an animal analogy (theromorphie). It does not seem to me necessary, in order to affirm its reversive nature, that this should be the normal arrangement in all the simians. It occurs in a large number of them and in many other animals, which seems to me sufficient; especially as in man it occurs

most frequently in what are held the lower races." What makes this announcement doubly interesting is that Professor Le Double is not one of those who call every representation of a condition normal in some animal a reversion. This was one of the mistakes of the cruder days of evolution. On the contrary, he maintains, as we have, that similarity of certain parts is no proof of descent. This is true both when we deal with structures that are normal in a species and when we deal with such as appear exceptionally in individuals. What has long been a crucial point in our mind is whether we are justified in calling a peculiarity a reversion unless we can point out at least a plausible line of descent which shall lead us back to it, and which, moreover, shall not be at variance with the pedigree necessary to account in the same way for other anomalies. To say, as some do, that there is no way of tracing by descent some particular feature through the mammalia and that, therefore, we must call its occasional appearance a reversion to something still earlier is simply to beg the question. If what we have suggested be demanded, it seems that, at present at least, the difficulties presented by the theory of reversion are insuperable. Professor Le Double, judging from the above quotation, would hardly think such a demand justifiable. None the less he very judiciously recognizes other causes.

We do not write, however, for the purpose of discussion. Our object is instead to bring an excellent book to the notice of those interested in the subject. Had it no other merit than that of bringing together the observations that have been made in the last generation, it would be indispensable to anatomists who wish to study the deeper problems.

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SCIENTIFIC JOURNALS AND ARTICLES.

The Botanical Gazette for January contains the following articles: 'A Morphological Study of *Elodea canadensis*,' by R. B. Wylie, brings out the general facts in regard to floral