

On Craniology. By J. W. EASTWOOD, M.D., Edin., Dinsdale Park Retreat, Darlington.

There are two classes of men who occupy themselves in observations on mental functions, frequently working widely apart from each other. These are, the metaphysicians, who investigate the phenomena of mind apart from anatomical or physiological facts, and the physiologists, who keep as exclusively to their own labours. Neither of these classes of men have as yet formed any philosophical system of the mental powers, and other functions of the brain; and it may be safely asserted that it is only by a combination of metaphysics and physiology that we can advance any considerable steps in our knowledge. The philosophical Reid, whose greatest disciple was Sir William Hamilton, stated many years ago, in his "Essays on the Powers of the Human Mind," that they are "so many, so various, and so connected and complicated in most of their operations, that there never has been any division of them proposed which is not liable to considerable objections." All the classifications made by metaphysicians differ materially from each other, and what was true in Reid's time is true now. We have a different race of metaphysicians from those who flourished years ago, different from Reid, Dugald Stewart, and Brown, but as yet we seem no nearer than we were to a systematic and comprehensive classification of mental faculties, or more properly, of the functions of the brain. I would not say that no progress has been made, for a vast mass of facts has been accumulated, and careful observations have been made, which will be available at some future period for a scientific and philosophical classification.

From a very early period, and especially since mental qualities were believed to reside in the liver, stomach, spleen, or kidneys, the brain has been recognised as the organ of all mental manifestations, and a certain amount of correspondence has been believed to exist between the shape of the cranium, the size of the brain, and the character of the individual. This has been amply proved in reference to large numbers of persons representing different races of mankind, and in the researches connected with this subject, the English and Americans have done more than the Germans and French.

We find the principal races of mankind possessed of skulls

of very varied shapes, but within certain limits these are modifications of three types, the prognathous or Negro, the pyramidal or Mongolian, and the oval or Caucasian. The skulls differ in size, as well as shape, the largest being the more highly developed, the Caucasian; but amongst each race may be found skulls which belong more or less to the other types. These, however, are exceptions, which are found frequently in some nations, in others more rarely. As all the forms of skull may be referred to these three types, the difference of race characteristics dependent upon them is a legitimate argument in favour of there being some close connection between the shape of the skull and cerebral functions. A system of craniology may yet therefore be found which shall embrace these varieties of skull, not only amongst nations, but amongst individuals. No system yet discovered deals satisfactorily with these varieties amongst the crania of mankind. The different modes which have been used for ascertaining the cranial capacity, and the functions of the brain, are as yet of only partial application, and I refer now specially to the measurement of the cranium by Camper's facial angle, and the system of phrenology. The former deals merely with size, the latter endeavours to ascertain from size and external configuration the qualities of individuals.

There are three points that demand our consideration at the outset of an enquiry of this kind.

I. That there is a close correspondence between the size and configuration of the brain, and the size and configuration of the bony envelope. This cannot be doubted either in man or the lower animals, subject, however, to certain modifications as regards the thickness of the skull, the size of the sinuses, and the internal bony projections.

II. That the general size of the brain is the measure of the general power of the mind. This statement, relied upon by phrenologists, but not exclusively belonging to them, can scarcely be denied, yet it has caused much controversy, as there are so many modifying circumstances in connection with it. The reference to the principal varieties of mankind proves its general truth, for the lower races have the smallest amount of brain, and the Caucasian the largest. And yet amongst the negro tribes there are some that are scarcely behind some European nations. Livingstone found the Makololo and the Londa people with good heads, of fair size, and of almost oval shape. We can scarcely doubt that these

people are capable of attaining a higher degree of civilization than the more typical negroes of the Coast of Guinea, and that they only require favourable circumstances to become superior to their brethren of the same race. On the other hand, the Irish of Ulster were driven, in 1641 and 1689, from Armagh and South Down into Connaught, and their descendants are not equal to their countrymen. They are only 5 feet 2 inches in height, they have become more prognathous, and are amongst the lowest of the Irish people, for deficient food and isolation have caused great deterioration. By Camper's facial angle, the orang outang measures 30° , the chimpanzee 35° , the Australians and Negroes 64° to 70° , whilst the higher races measure 70° to 85° . The cranial capacity of various races and nations, measured more correctly by the empty skull being filled with shot corns, shows the relative order to be as follows, beginning with the lowest:—Australians, Polynesians, Hottentots, Peruvians, Mexicans, American Indians in general, American Negroes, Malays, African Negroes, Indians or Hindoos, Parisians of the 12th century, Parisians of the 19th century, Anglo-Americans, Parisians of the present day, Germans, English. These measurements show that in the case of the Parisians, there is an increase of skull owing to civilization, and this statement is no doubt true generally. Dr. Thurnam has examined many brains, and has found the average size greater in educated people than in others, in proportion to the size of the body.

The question of size being the measure of power is more complicated than *a priori* it would appear, as it is liable to so many exceptions. Some great men have had very large heads, as Cuvier, Schiller, Sir Walter Scott, but, on the other hand, other great men have not had great heads. Napoleon I. is often mentioned as an instance of a large-headed man, but it is a fact that the hats of some of his soldiers would go right over his head, and yet he was unquestionably the greatest man in France, and exercised a tremendous brain-power over others. Byron and Tiedemann had small heads. The expression, "a good head, a capital head," frequently heard, does not always refer to the exploits of the individual, but to the size and shape, and the common people often draw their inferences as to the intellectual capacity of a person from the size and shape of the skull. On the other hand, a man with a large head is often called a "thick-head," just as a big man is often called "a great good-for-nothing." The largest-headed man whom I know has never been much more than a

learned imbecile. The average of men is considerably greater than that of women, the weight of brain being $49\frac{1}{2}$ oz., and 44 oz. Temperament and size of body are important elements to be considered. In persons of phlegmatic temperament, there is often not only a large body, but a large brain, with slow functions. In individuals of the sanguine and nervous temperaments, a small body and a small brain often go together, with great mental and bodily activity. The relative weight of brain to that of the body is a more correct standard of measurement than the absolute weight, which is greater in man than in most animals. The relative weight is, however, less than in some song birds, and in American monkeys.

In this estimate of size it is necessary to bear in mind that there is an original and an educated intelligence. Shape of skull may give us some idea of the former, but it cannot tell us much of the latter, unless it be later in life. Parchappe says the cranium increases up to the 50th year, and considerably diminishes after the 60th. Many experiments show that the skull is increased in size by education. In my own case the frontal region especially has become fuller, as ascertained by a correct cast of the head taken 20 years ago. On the occasion of my graduation in Edinburgh, I was much struck by the difference between the professors of the University and the men of business who were bailies of the city, and who were present as patrons of the University. Original choice or profession may partly account for this difference. As races of men undergo certain progressive changes, so may individuals. It is chiefly the height of the skull, and the development of the frontal region, which are affected thereby, and by which the internal capacity of the cranium is increased.

In races capable of civilization, the anterior sutures remain open longer, and are obliterated at a later period than the posterior. The reverse is true in races of lower character, and this would explain, so far, the stoppage of development in the negro at or about puberty, until which time he is as forward as the white boy. We have the best evidence in the change produced in the course of centuries, by education, in the Parisian skulls, which have been obtained from the catacombs and carefully examined. In the cave and stone periods of European life, skulls have had foreheads, and approach the lower races in character. It is remarked by Carl Vogt, that "there can be no doubt but the prosperous and wealthy classes of human society are, on the whole, physically finer and stronger than the lowest classes, who are much exposed

to misery and want. It is further unquestionable that those classes which, in successive generations, follow mental occupations, possess a greater development of the skull than the ignorant masses who are engaged in the meanest occupations." A statement counter to this may be made that the prosperous classes are apt to become effete, without newer blood drawn from a lower stratum of society, and that famous fathers rarely have famous sons. There are exceptions to this in families noted for hereditary ability, as the Stanleys, Cecils, and others. Culture, wealth, alimant, and particular occupations, however, improve a race generally, whilst hunger, anxiety, war, and oppression deteriorate it; so that the characters are transmitted through successive generations. The Irish of Ulster have been already mentioned, and some of the American Indians have evidently fallen much below their former position.

Amongst men who distinguish themselves, the difference from others is not so much in capacity of brain, as in taste or inclination; so that perseverance will succeed without the existence of great talent. This proves that quality of brain is of as much importance as size. There is less mental activity in the lower classes, and the movements of the body are slower than in the educated classes.

III. The third point for consideration is, that there are organs of the brain corresponding to the various cerebral functions. Our knowledge on this subject is at present very unsatisfactory. Lord Bacon said, "There should be an enquiry of the seats and domiciles which the several faculties of the mind do occupy in the body and the organs thereof." When the great philosopher wrote this, he was under the belief that faculties of the mind resided elsewhere than in the brain; but we have only to make this alteration, and his words may be applied to the present time.

The most obvious division of the cerebral mass is into two hemispheres, and each of these into three lobes, corresponding to the frontal, parietal, and occipal bones or vertebræ. These lobes may be said to represent the three great races, who have been called the men of the day, the Caucasians; men of the twilight, the Mongolians; and the men of the night, or the Negroes. There is some apparent physical reason for this, for the frontal lobe is the most developed amongst the higher races of men, and it is generally accepted as being the particular seat of the intellectual faculties. The correspondence is not so obvious in the other instances. Aristotle

thought the anterior lobes were for common sense, the middle for judgment and reflection, and the posterior for memory. The dual character of the brain renders it like most of the other organs of the body, and affords an explanation of some remarkable mental phenomena, into which I cannot enter. The three-fold division of each hemisphere corresponds to the division of the phrenologists into intellect, moral faculties, and the propensities. If this could be satisfactorily established, it would be a great step in advance. From the fact that the senses of sight, hearing, taste, and smell, can be accurately localised in the brain, we are warranted in concluding that other portions of the cerebral mass have also special functions. No great success has hitherto attended the efforts made for the localization of organs, and neither slicing the brain in the lower animals, nor wounds of the brain in man, nor morbid conditions, have thrown much light upon the subject. The attempt to fix the organ of speech in the third convolution of the left anterior lobe has failed, after the examination of many cases of disease. The convolutions of the brain vary much in shape and size, and are probably the seats of different functions. They contain more or less grey matter, which seems to be the originating substance, with some white matter, which is the connecting tissue. The convolutions differ from each other in depth of grey matter, and therefore a small compact brain may contain a large amount of it. The superficial grey substance is probably connected with mental activity, and the deeper seated portion with sensation; therefore, the more convolutions, and the deeper they are, the more intellect. Sir James Y. Simpson had a large brain and fine convolutions. Wagner found a complex arrangement of fibres in the brains of some eminent men: Marshall says the brain of a bushwoman which he examined had fewer and more rudimentary convolutions than the brain of a European. In the lower animals the convolutions are generally less complex than they become as we ascend the scale. The convolutions on the outer or convex surface of the hemispheres, attain their highest development in man, and are peculiarly characteristic of the human brain.

Phrenology.—No definite system of craniology has been put forward, except the one discovered by Gall and Spurzheim, and since modified by other observers. Notwithstanding the neglect into which phrenology has fallen, it is worthy of some consideration; and of late, many things have been done to show that it is not true, whilst no efforts have been made to

follow in the same direction, and ascertain from the external configuration of the skull what information can be gained thereby. That size is a measure of power under certain conditions, is generally allowed; and that there are special organs and functions, is admitted to be more than probable by Dr. Carpenter. These views are the basis of phrenology, and must be almost necessarily the basis of any system of craniology. The localization of organs is also rendered probable by the existence of partial insanity, when it cannot be said that the whole brain is diseased. The objections to phrenology are that it is theoretically too perfect a system, appropriating the surface of the brain to the different faculties, and leaving the unknown central portions without any functions. This will always be a difficulty; but instead of adapting the system to this difficulty, phrenology has passed over it, as there are no organs left to be distributed over the central grey masses. Comparative anatomy and physiology are in opposition to phrenology, for the posterior lobe, said to be the seat of the animal propensities, is last developed, and attains its greatest development in man and the higher animals.

With respect to the cerebellum, it is probable that phrenology is partially true, which is admitted by Carpenter, and that whilst the middle lobe or vermiform process is the seat of sexual feeling, the other lobes are connected with muscular movements. It would be well if our asylum physicians would use their large opportunities, and make careful observations on this subject, after the manner of Dr. Lauder Lindsay, who has examined a number of patients, with a view to test the truth of phrenology, and to see if it would throw any light on our knowledge of insanity. He has come to the conclusion that, "while there is apparently much truth in phrenology, especially in regard to some of its general laws or doctrines, there is unquestionably more error."

My own experience is, that some of the organs are very correctly localized; and I would specially mention the perceptive organs generally, but not in detail; the reflective organs of comparison and causality, and the moral faculties of firmness, self-esteem, love of approbation, and cautiousness. Some years ago I had an excellent opportunity of testing the practical value of phrenology as a means of judging character. A most intelligent and earnest phrenologist examined the heads of a number of friends and acquaintances of my own, and I have notes of twenty-one of these cases, consist-

ing of medical men, clergymen, and other professional persons, ladies and children. In no instance had the operator ever before seen the individuals examined, and as I knew them so well, he appealed to me to correct him where he was wrong. I can only say that the descriptions were so accurate as to afford striking evidence of the truth of phrenology. By limiting and modifying its extreme pretensions, it is possible yet to gain something from it, whereby a true system of craniology may be evolved. It will require many observers to succeed in it, and much careful observation is needed, but the result will repay the labour of those who engage in the work. If we are enabled by these means to understand the morbid manifestations of the brain, for the classification of its diseases, and for the diagnosis of insanity, we shall render great service to the special branch of the profession in which we are engaged.

Observations on the President's Address, 1871. By G. FIELDING BLANDFORD, M.D.

An engagement prevented my reaching the meeting at the College of Physicians, on the third of August, in time to hear the President's address, and though I had something to say on the subjects contained therein, I had not the presumption to offer a criticism without having heard it, while the discussion which followed did not enable me to gather what had been put forward. By the kindness of Dr. Maudsley, however, I have been permitted to read his remarks, and have found them in every way worthy of the high encomiums passed upon them by more than one speaker; yet one or two observations occur to me. Dr. Maudsley is fond of paradoxes, and he startles us with one at the commencement. He tells us that he is convinced of the important part which hereditary predisposition plays in the causation of insanity—that he thinks no person goes mad, save from palpable physical causes, who does not show more or less plainly by his gait, manner, gestures, habits of thought, feeling and actions, that he is predestined to go mad. And yet when he is discussing the advice to be given as to the marriage of people sprung of insane ancestors, he sums up his opinion in these words—“I cannot think science yet has the right to forbid marriage to those in whom some tendency to insanity exists.”