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From the American Journal of Science and Arts, No. 2, Vol. 38.

R E V I E W

OF

MORTON'S CRANIA AMERICANA.

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REVIEW

MORTON'S CRANIA AMERICANA.

R35976

Crania Americana; or a Comparative view of the Skulls of various Aboriginal Nations of North and South America; to which is prefixed an Essay on the Varieties of the Human Species, illustrated by seventy-eight plates and a colored map; by SAMUEL GEORGE MORTON, M. D., Professor of Anatomy in the medical department of Pennsylvania College, at Philadelphia, &c. &c. Philadelphia: J. Dobson. London: Simpkin, Marshall & Co. Letter Press, pp. 296, folio, 1839.

WE hail this work as the most extensive and valuable contribution to the natural history of man, which has yet appeared on the American continent, and anticipate for it a cordial reception by scientific men not only in the United States, but in Europe. The subject is one of great interest, and Dr. Morton has treated it in a manner at once scientific and pleasing, while the beauty and accuracy of his lithographic plates are not surpassed by any of the modern illustrations of science.

The principal design of the work, says Dr. Morton, has been "to give accurate delineations of the crania of more than forty Indian nations, Peruvian, Brazilian and Mexican, together with a particularly extended series from North America, from the Pacific Ocean to the Atlantic, and from Florida to the region of the Polar tribes. Especial attention has also been given to the singular distortions of the skull caused by mechanical contrivances in use among various nations, Peruvians, Charibs, Natches, and the tribes inhabiting the Oregon Territory." His materials, in this department, are so ample, that he has been enabled to give a full exposition of the subject. He has also bestowed particular attention on the crania from the mounds of this country, which have been compared with similar relics, derived both from ancient and modern tribes, "in order to examine, by the evidence of osteological facts, whether the American aborigines, of all epochs, have belonged to one race, or to a plurality of races."

The introductory Essay, "on the varieties of the human species," occupies ninety-five pages. It is learned, lucid, and like the whole work, classically written. The author notices the great diversities of opinion that have existed among naturalists regarding the grouping of mankind into races; Linnæus referred all the human family to five races; Buffon proposed six great di-

visions; subsequently, however, he reduced it to five; while Blumenbach, adopting the arrangement of Buffon, has changed the names of some of the divisions, and designated, with greater accuracy, their geographical distribution. Cuvier admitted three races only, the Caucasian, Mongolian and Ethiopian; while Malté Brun enumerates sixteen. A French professor, Broc, in his *Essai sur les Races Humaines*, published in 1836, has attempted to establish several *sub-genera*. The cause of these wide diversities of opinion obviously lies in the imperfect knowledge yet possessed of the subject.

Dr. Morton adopts the arrangement of Blumenbach in so far as regards the great divisions, substituting, however, the word *race* for the term "variety" of the German author, and changing the order in which Blumenbach considers some of them. He considers the human species as consisting of *twenty-two* families, which he arranges under the heads of the Caucasian, Mongolian, Malay, American, and Ethiopian races.

I. "THE CAUCASIAN RACE is characterized by a naturally fair skin, susceptible of every tint; hair fine, long and curling, and of various colors. The skull is large and oval, and its anterior portion full and elevated. The face is small in proportion to the head, of an oval form, with well proportioned features. The nasal bones are arched, the chin full, and the teeth vertical. The race is distinguished for the facility with which it attains the highest intellectual endowments."

The subdivisions of this race are into—1st. The *Caucasian*; 2d. The *Germanic*; 3d. The *Celtic*; 4th. The *Arabian*; 5th. The *Lybian*; 6th. The *Nilotic*, (Egyptian;) and 7th. The *Indostanic* families.

II. "THE MONGOLIAN RACE. This is characterized by a sallow or olive colored skin, which appears to be drawn tight over the bones of the face; long, black, straight hair, and thin beard. The nose is broad and short; the eyes are small, black, and obliquely placed, and the eye-brows arched and linear; the lips are turned, the cheek bones broad and flat, and the zygomatic arches salient. The skull is oblong-oval, somewhat flattened at the sides, with a low forehead. In their intellectual character the Mongolians are ingenious, imitative, and highly susceptible of cultivation.

The subordinate divisions are into—8th. The *Mongol-Tartar*; 9th. The *Turkish*; 10th. The *Chinese*; 11th. The *Indo-Chinese*; and 12th. The *Polar* families.

III. "The MALAY RACE. It is characterized by a dark complexion, varying from a tawny hue to a very dark brown. Their hair is black, coarse, and lank, and their eye-lids are drawn obliquely upwards at the outer angles. The mouth and lips are large, and the nose is short and broad, and apparently broken at its root. The face is flat and expanded, the upper jaw projecting, and the teeth salient. The skull is high and squared or rounded, and the forehead low and broad. This race is active and ingenious, and possesses all the habits of a migratory, predaceous and maritime people."

The subdivisions embrace—13th. The *Malay*; and 14th. The *Polynesian* (or South Sea Island) families.

IV. "The AMERICAN RACE is marked by a brown complexion, long, black, lank hair, and deficient beard. The eyes are black and deep set, the brow low, the cheek bones high, the nose large and aquiline, the mouth large, and the lips tumid and compressed. The skull is small, wide between the parietal protuberances, prominent at the vertex, and flat on the occiput. In their mental character the Americans are averse to cultivation, and slow in acquiring knowledge; restless, revengeful, and fond of war, and wholly destitute of maritime adventure."

The families into which this race is subdivided, are two: 15th. The *American*; and 16th. The *Toltecan*.

V. "The ETHIOPIAN RACE is characterized by a black complexion, and black, woolly hair; the eyes are large and prominent, the nose broad and flat, lips thick, and the mouth wide; the head long and narrow, the forehead low, the cheek bones prominent, the jaws projecting, and the chin small. In disposition, the negro is joyous, flexible, and indolent; while the many nations which compose this race present a singular diversity of intellectual character, of which the far extreme is the lowest grade of humanity.

This race is divided into—17th. The *Negro*; 18th. The *Caffrarian*; 19th. The *Hottentot*; 20th. The *Oceanic Negro*; 21st. The *Australian*; and 22d. The *Alforian* families. The latter family is most numerous in New Guinea, the Moluccas and Magindano.

The map which precedes the work, shows the geographical distribution of the five races of men; and the lines of demarcation are those indicated by Professor Blumenbach, as separating the different races in the primitive epochs of the world. These divisions, of necessity, are only approximations to truth. The boundary between the *Caucasian* and *Mongolian* races is ex-

tremely vague. The line adopted runs from the Ganges in a northwestern direction to the Caspian Sea, and thence to the River Obi, in Russia. "At a comparatively recent period, however, several Mongolian nations have established themselves in Europe; as the Samoyedes, Laplanders, &c." The *Ethiopian line* is drawn north of the Senegal River, obliquely east and south to the southern frontier of Abyssinia, and thence to Cape Guardafui, thus embracing the Atlas Mountains. "Of the latter, little is known; but many negro nations inhabit to the north of them, at the same time that the Arab tribes have penetrated far beyond them to the south, and in some places have formed a mixed race with the natives."

Dr. Morton gives a brief but clear description, extending to his 91st page, of the leading characteristics of each of these families, accompanying his text by references to the authorities from which the information is drawn. The labor and accuracy of the true philosopher are here conspicuous. After perusing these details, however, we are strongly impressed with the conviction that this branch of science is still only in its infancy. The descriptions of the mental qualities which distinguish the different families of mankind, given even by the best travellers, are vague and entirely popular. There is scarcely an instance of the specification of well defined mental faculties, present or absent in the races, or possessed in peculiar combinations; nothing, in short, which indicates that the travellers possessed a mental philosophy under the different heads of which they could classify and particularize the characteristic qualities of mind which they observed, as the botanists describe and classify plants, or the geologists minerals. The anatomical characters of the races, also, are still confined to a few particulars, and many even of these have been drawn from the inspection of a very limited number of specimens. The subject, however, possesses so much inherent interest and importance, that we may expect rapid advances to be made in its future development.

The unity of the human species is assumed by Dr. Morton. It is known that the *black* race possess an apparatus in the skin, which is wanting in that of the *white* race. Flourens states that there "are, in the skin of the *white* race, three distinct laminæ or membranes—the *derm*, and two *epiderms*; and in the skin of the *black* race, there is, besides the *derm*

and the two epiderms of the *white* race, a particular apparatus, an apparatus which is altogether wanting in the man of the *white* race, an apparatus composed of two layers, the external of which is the seat of the *pigmentum*, or coloring matter of negroes.* "The coloring apparatus of the negro is always found in the mulatto." Flourens adds, "The *white* race and the *black* race are then, I repeat, two essentially distinct races. The same is true of the *red*, or American race. Anatomy discovers, under the second epiderm of the individual of the *red*, *copper-colored*, *Indian* or *American* race, (for this race is called indifferently by all these names,) a *pigmental apparatus*, which is the seat of the *red* or *copper color* of this race, as the *pigmental apparatus* of the negro is the seat of his black color."

Dr. Morton does not advert to the existence of this pigmental apparatus in the American race. The investigations of Dr. McCulloh, he observes, "satisfactorily prove that the designation '*copper-colored*,' is wholly inapplicable to the Americans as a race." "The *cinnamon* is, in Dr. McCulloh's apprehension, the nearest approach to the true color" of the native Americans. Dr. Morton considers that the "*brown race*" most correctly designates them collectively. "Although," says he, "the Americans thus possess a pervading and characteristic complexion, there are occasional and very remarkable deviations, including all the tints from a decided white to an unequivocally black skin." He shows, also, by numerous authorities, that "climate exerts a subordinate agency in producing these diversified hues." The tribes which wander along the burning plains of the equinoctial region, have no darker skins than the mountaineers of the temperate zone. "Again, the Puelchés, and other inhabitants of the Magellanic region, beyond the 55th degree of south latitude, are absolutely darker than the Abipones, Macobios and Tobas, who are many degrees nearer the equator. While the Botocudys are of a clear brown color, and sometimes nearly white, at no great distance from the tropic; and moreover, while the Guyacas, under the line, are characterized by a fair complexion, the Charruas, who are almost black, inhabit the 50th degree of south latitude; and the yet blacker Californians, are 25 degrees north of the equator." "After all," he adds, "these differences in complex-

* Annales des Sciences Nat. t. x, Dec. 1838, pp. 361, &c.

ion are extremely partial, forming mere exceptions to the primitive and national tint that characterizes these people, from Cape Horn to the Canadas. The cause of these anomalies is not readily explained; that it is not climate is sufficiently obvious; and whether it arises from partial immigrations from other countries, remains yet to be decided."

Buffon defines species—"A succession of similar individuals which reproduce each other." Cuvier also defines species—"The union of individuals descended from each other or from common parents, and of those who resemble them as much as they resemble each other." "The apparent differences of the races of our domestic species," says Cuvier, "are stronger than those of any species of the same genus." "The fact of the *succession*, therefore, and of the *constant succession*, constitutes alone the *unity of the species*." Flourens, who cites these definitions, concludes that "*unity, absolute unity*, of the human species, and *variety* of its races, as a final result, is the general and certain conclusion of all the facts acquired concerning the *natural history of man*."*

Dr. Morton, while he assumes the unity of the species, conceives that "each race was adapted from the beginning (by an all-wise Providence) to its peculiar local destination. In other words, that the physical characteristics which distinguish the different races, are independent of external causes."

This inference derives support from the fact adverted to by Dr. Caldwell, in his "Thoughts on the Unity of the Human Species." "It is," says he, "4179 years since Noah and his family came out of the ark. They are believed to have been of the Caucasian race." "3445 years ago, a nation of Ethiopians is known to have existed. Their skins, of course, were dark, and they differed widely from the Caucasians in many other particulars. They migrated from a remote country and took up their residence in the neighborhood of Egypt. Supposing that people to have been of the stock of Noah, the change must have been completed, and a new race formed, in 733 years, and probably in a much shorter period."† Dr. Morton observes, that "the recent discoveries in Egypt give additional force to the preceding state-

* Flourens' article before cited, and the Edin. New Philosophic. Journ., Vol. xxvii, p. 358, October, 1839.

† P. 72. Phila., 1830.

ment, inasmuch as they show, beyond all question, that the Caucasian and Negro races were as perfectly distinct in that country, upwards of three thousand years ago, as they are now ; whence it is evident, that if the Caucasian was derived from the Negro, or the Negro from the Caucasian, *by the action of external causes*, the change must have been effected in at most one thousand years ; a theory which the subsequent evidence of thirty centuries proves to be a physical impossibility ; and we have already ventured to insist that such a commutation could be effected by nothing short of a miracle." p. 88.

Dr. Morton describes the general characteristics of the American, under the head of the "Varieties of the Human Species," and then enters on a special description of the "crania" of upwards of seventy nations or tribes belonging to that family, illustrating the text by admirable plates of the crania, drawn from skulls, mostly in his own possession, and of the full size of nature.

He regards the American race as possessing certain physical traits that serve to identify them in localities the most remote from each other. There are, also, in their multitudinous languages, the traces of a common origin. He divides the race into the "Toltecan family," which bears evidence of centuries of demi-civilization, and into the "American family," which embraces all the barbarous nations of the new world, excepting the Polar tribes, or Mongol Americans. The Eskimaux, and especially the Greenlanders, are regarded as a partially mixed race, among whom the physical character of the Mongolian predominates, while their language presents obvious analogies to that of the Chippewyans, who border on them to the south.

In the American family itself, there are several subordinate groups. 1st. The *Appalachian* branch includes all the nations of North America, excepting the Mexicans, together with the tribes north of the river of Amazon and east of the Andes. 2d. The *Brazilian* branch is spread over a great part of South America east of the Andes, viz. between the Rivers Amazon and La Plata, and between the Andes and the Atlantic, thus including the whole of Brazil and Paraguay north of the 35th degree of south latitude. In character, these nations are warlike, cruel, and unforgiving. They turn with aversion from the restraints of civilized life, and have made but trifling progress in mental cul-

ture or the useful arts. In character, the Brazilian nations scarcely differ from the Appalachian ; none of the American tribes are less susceptible of cultivation than these ; and what they are taught by compulsion, in the missions, seldom exceeds the humblest elements of knowledge. 3d. The *Patagonian* branch includes the nations south of the La Plata, to the Straits of Magellan, and the mountain tribes of Chili. They are for the most part distinguished for their tall stature, their fine forms, and their indomitable courage, of all which traits the Auracians possess a conspicuous share. 4th. The *Fuegian* branch, which roves over a sterile waste, computed to be as large as one half of Ireland. Forster computes their whole number at only two thousand souls. Their physical aspect is altogether repulsive, and their domestic usages tend to heighten the defects of nature. The expression of the face is vacant, and their mental operations are to the last degree slow and stupid. The difference between them and the other Americans, is attributed by Dr. Morton to the effects of climate and locality.

Thus far Dr. Morton has travelled over ground previously occupied by other naturalists ; but we proceed to a field in which he has had the courage and sagacity to enter boldly on a new path. He has added to his text numerous and minute measurements of the size and capacity not only of each entire cranium, but of its different parts, with a view to elucidate the connection (if there be any) between particular regions of the brain and particular mental qualities of the American tribes. In his dedication to John S. Phillips, Esq., of Philadelphia,* he observes : " It may, perhaps, be thought by some readers, that these details are unnecessarily minute, especially in the phrenological tables ; and again, others would have preferred a work conducted throughout on phrenological principles. In this study I am yet a learner ; and it appeared to me the wiser plan to present the facts unbiassed by theory, and let the reader draw his own conclusions. You and I have long admitted the fundamental principles of phrenology, viz. that the brain is the organ of the mind, and that its different parts perform different functions ; but we have been

* Dr. Morton acknowledges himself to be under many obligations to Mr. Phillips in the prosecution of his enquiries, and says that it was he who invented the machines used in making the measurements, and executed many of them himself.

slow to acknowledge the details of cranioscopy as taught by Dr. Gall, and supported and extended by subsequent observers. We have not, however, neglected this branch of enquiry, but have endeavored to examine it in connection with numerous facts, which can only be fully appreciated when they come to be compared with similar measurements derived from the other races of men." We shall state, in a subsequent part of this article, the conclusions at which Dr. Morton has arrived, in consequence of his observations and measurements; meantime it is important to state the principles on which he proceeded.

In a few years, it will appear a singular fact in the history of mind, that in the nineteenth century, men holding the eminent station in literature occupied by Lord Jeffrey and Lord Brougham, should have seriously denied* that the mind, in this world, acts by means of material organs; yet such is the case; and the denial can be accounted for only by that entire neglect of physiology, as a branch of general education, which prevailed in the last century, and by the fact that the metaphysical philosophy in which they were instructed, bore no reference to the functions of the brain. We need not say, that no adequately instructed naturalist doubts that the brain is the organ of the mind. But there are two questions, on which great difference of opinion continues to prevail: 1st. Whether the *size* of the brain (health, age, and constitution being equal) has any, and if so, what influence, on the power of mental manifestation? and 2dly. Whether different faculties be, or be not, manifested by particular portions of the brain.

The *first* proposition, that the size of the brain, other conditions being equal, is in direct relation to the power of mental manifestation, is supported by analogy, by several well known facts, and by high physiological authorities. The power of smell, for example, is great in proportion to the expansion of the olfactory nerve on the internal nostrils, and the volume of the nerve itself bears a direct relation to the degree of that expansion. The superficial surface of the mucous membrane of the ethmoidal bone, on which the nerve of smell is ramified, is computed in man to extend to 20 square inches, and in the seal, which has

* Lord Jeffrey, in the Edin. Review, No. 88, and Lord Brougham in his Discourse on Natural Theology, p. 120.

great power of smell, to 120 square inches. The optic nerve in the mole is a slender thread, and its vision is feeble; the same nerve is large and thick in the eagle, accompanied by intense powers of sight. Again, the fact admits of demonstration, that deficiency in the size of the brain is one, although not the only, cause of idiotcy. Although the brain be healthy, if the horizontal circumference of the head, with the muscular integuments, do not exceed thirteen or fourteen inches, idiotcy is the *invariable* consequence. Dr. Voisin states that he made observations on the idiots under his care at the Parisian Hospital of Incurables, and found that in the lowest class of idiots, where the intellectual manifestations were null, the horizontal circumference, taken a little higher than the orbit, varied from eleven to thirteen inches, while the distance from the root of the nose backwards, over the top of the head, to the occipital spine, was only between eight and nine inches; and he found no exception to this fact. If, therefore, extreme defect of size in the brain be invariably accompanied by mental imbecility, it is a legitimate inference that size will influence the power of manifestation through all other gradations of magnitude, always assuming other conditions to be equal.

Physiological authorities are equally explicit on this subject. Magendie says, "the volume of the brain is generally in direct proportion to the capacity of the mind. We ought not to suppose, however, that every man having a large head is necessarily a person of superior intelligence; for there are many causes of an augmentation of the volume of the head besides the size of the brain; but it is rarely found that a man distinguished by his mental faculties has not a large head. The only way of estimating the volume of the brain, in a living person, is to measure the dimensions of the skull; every other means, even that proposed by Camper, is uncertain."

The difference of mental power between young and adult minds, is a matter of common observation. The difference in the weights of their brains is equally decided.

According to Cruveilhier, in three young subjects, the weights of the brains were as follows:

In the first, the brain weighed 2 lbs. 2 oz.; the cerebellum, $4\frac{1}{3}$ oz.; together, 2 lbs. $6\frac{1}{3}$ oz. In the second, the brain weighed 2 lbs. 8 oz.; the cerebellum, $3\frac{1}{2}$ oz.; together, 2 lbs. $11\frac{1}{2}$ oz. In

the third, the brain weighed 2 lbs. 5 oz. ; the cerebellum, 5 oz. ; together, 2 lbs. 10 oz.

In the appendix to Dr. Monro's work on the brain, Sir William Hamilton states the average weight of the *adult* male Scotch brain and cerebellum to be 3 lbs. 8 oz. troy.

Again, a difference in mental power between men and women is also generally admitted to exist, and there is a corresponding difference in the size of their brains.

Sir William Hamilton states the average weight of the adult female Scotch brain and cerebellum, to be 3 lbs. 4 oz. troy ; being 4 oz. less than that of the male. He found one male brain in *seven* to weigh above 4 lbs. ; and only one female brain in a *hundred* exceeded this weight.

In an essay "on the brain of the negro, compared with that of the European and the ourang outang, published in the Philosophical Transactions for 1836, part II, Professor Tiedemann, of Heidelberg, adopts the same principle. After mentioning the weights of fifty-two European brains, examined by himself, he states that "the weight of the brain in an adult male European, varies between 3 lbs. 2 oz. and 4 lbs. 6 oz. troy. The brain of men who have distinguished themselves by their great talents, is often very large. The brain of the celebrated Cuvier weighed 4 lbs. 11 oz. 4 dr. 30 gr. troy, and that of the distinguished surgeon Dupuytren weighed 4 lbs. 10 oz. troy. The brain of men endowed with but feeble intellectual powers is, on the contrary, often very small, particularly in congenital idiotismus. The female brain is lighter than that of the male. It varies between 2 lbs. 8 oz. and 3 lbs. 11 oz. I never found a female brain that weighed 4 lbs. The female brain weighs on an average from four to eight ounces less than that of the male ; and this difference is already perceptible in a new-born child."

We have adduced these proofs and authorities in support of the proposition that size influences power, because we conceive it to be a principle of fundamental importance in every investigation into the natural history of man, founded on the physiology of the brain ; and also because in the hasty zeal of many of the opponents of phrenology, to undermine the discoveries of Dr. Gall, it has been denied with a boldness and pertinacity more allied to the spirit of contentious disputation, than to that of philosophical enquiry. Its importance in a dissertation on *national crania* is

very apparent. One of the most singular features in the history of this continent, is, that the aboriginal races, with few exceptions, have perished or constantly receded, before the Anglo-Saxon race, and have in no instance either mingled with them as equals, or adopted their manners and civilization. These phenomena must have a cause ; and can any enquiry be at once more interesting and philosophical than that which endeavors to ascertain whether that cause be connected with a difference in the brain between the native American race, and their conquering invaders ? Farther, some few of the American families, the Auracanian, for instance, have successfully resisted the Europeans ; and the question is important, whether in them, the brain be in any respect superior to what it is in the tribes which have unsuccessfully resisted ?

It is true, that Dr. Gall's fundamental principle, that size in the brain (other conditions being equal) is a measure of the power of mental manifestation, is directly involved in these enquiries ; but we can discover no reason why it should not be put to the test of an extensive and accurate induction of facts. The unphilosophical prejudice that every proposition and fact in physiology must be neglected or opposed, because it bears on the vexed question of phrenology, has been too long indulged. The best interests of science require that it should be laid aside, and we commend Dr. Morton for having resolutely discarded it. He does not enter the field as a partisan, for or against Dr. Gall's doctrines, but as a philosophical enquirer, and states candidly and fearlessly the results of his observations.

Dr. Morton reports the size in cubic inches, of the interior of nearly every skull described by him. "An ingenious mode," says he, "of taking the measurement of the internal capacity, was devised by Mr. Phillips. In order to measure the capacity of a cranium, the foramina were first stopped with cotton, and the cavity was then filled with *white pepper seed*,* poured into the foramen magnum until it reached the surface, and pressed down with the finger until the skull would receive no more. The contents were then transferred to a tin cylinder, which was well shaken in order to pack the seed. A mahogany rod (previously graduated to denote the cubic inches and parts contained in

* "White pepper seed was selected on account of its spherical form, its hardness, and the equal size of the grains. It was also sifted, to render the equality still greater."

the cylinder) being then dropped down, with its foot resting on the seed, the capacity of the cranium, in cubic inches, is at once read off on it."

Dr. Morton gives also measurements of particular regions of the brain, as indicated by the skull; and in this portion of his work, the phrenologists alone can claim precedence of him.

Secondly. The most distinguished philosophers on the mind, divide the human faculties into the active and intellectual powers; and some admit even subdivisions of the feelings into propensities common to man with the lower animals, and moral emotions; and of the intellect, into observing and reflecting faculties. Dr. Thomas Brown's division of the intellectual powers into simple and relative suggestion, corresponds with this last classification. If, then, the mind manifest a plurality of faculties, and if the brain be the organ of the mind, it appears to be a sound inference that the brain *may* consist of a plurality of organs. The presumptions which arise, in favor of this idea, from the constitution of the external senses and their organs, are strong. Each sense has its separate nervous apparatus. Nay, when the function of a part is compound, the nerves are multiplied, so as to give a distinct nerve for each function. The tongue has a nerve for voluntary motion, another for common sensation, and the best authorities admit a third nerve for *taste*, although the precise nerve is still in dispute. The internal nostrils are supplied with two nerves, the olfactory, and a nerve of common sensation, ramified on the mucous membrane, each performing its appropriate function. The spinal marrow consists, by general consent of physiologists, of at least two double columns, the anterior pair for voluntary motion, and the posterior pair for common sensation. Sir Charles Bell has demonstrated the distinct functions of the nerves proceeding from these columns. Farther, every accurate observer distinguishes diversities of disposition and inequalities of talents, even in the same individual. The records of lunatic asylums show numerous instances of partial idiotcy and partial insanity. These facts indicate that the brain consists of a plurality of organs, and this idea is countenanced by many high authorities in physiological science. "The brain is a very complicated organ," says Bonnet, "or rather *an assemblage of very different organs*."* Tissot contends that every perception has

* Palingénésie, I, 334.

different fibres;* and Haller and Van Swieten were of opinion that the internal senses occupy, in the brain, organs as distinct as the nerves of the external senses.† Cabanis entertained a similar notion,‡ and so did Prochaska. Cuvier says that "*Certain parts of the brain, in all classes of animals, are large or small, according to certain qualities of the animals;*"§ and he admits that Gall's doctrine of different faculties being connected with different parts of the brain, is nowise contradictory to the general principles of physiology.||

If, then, there be reason to believe that different parts of the brain manifest different mental faculties, and if the size of the part influence the power of manifestation, the necessity is very evident of taking into consideration the *relative proportions of the different parts of the brain*, in a physiological enquiry into the connection between the crania of nations and their mental qualities. To illustrate this position, we present exact drawings of two casts from nature; one, figure 1, is the brain of an American Indian; and the other, figure 2, the brain of an European. Both casts bear evidence of compression or flattening out, to some extent, by the pressure of the plaster; but the European brain is the flatter of the two. We have a cast of the entire head of this American Indian, and it corresponds closely with the form of the brain here represented.

It is obvious that the absolute quantity of brain, (although probably a few ounces less in the American,) *might* be the *same in both*; and yet, if different portions manifest different mental powers, the characters of the individuals, and of the nations to which they belonged, (assuming them to be types of the races,) might be exceedingly different. In the American Indian, the anterior lobe, lying between A A and B B is small, and in the European it is large, in proportion to the middle lobe, lying between B B and C C. In the American Indian, the posterior lobe, lying between C and D is much smaller than in the European. In the American, the cerebral convolutions on the anterior lobe and upper surface of the brain, are smaller than in the European.

* Œuvres, III, 33.

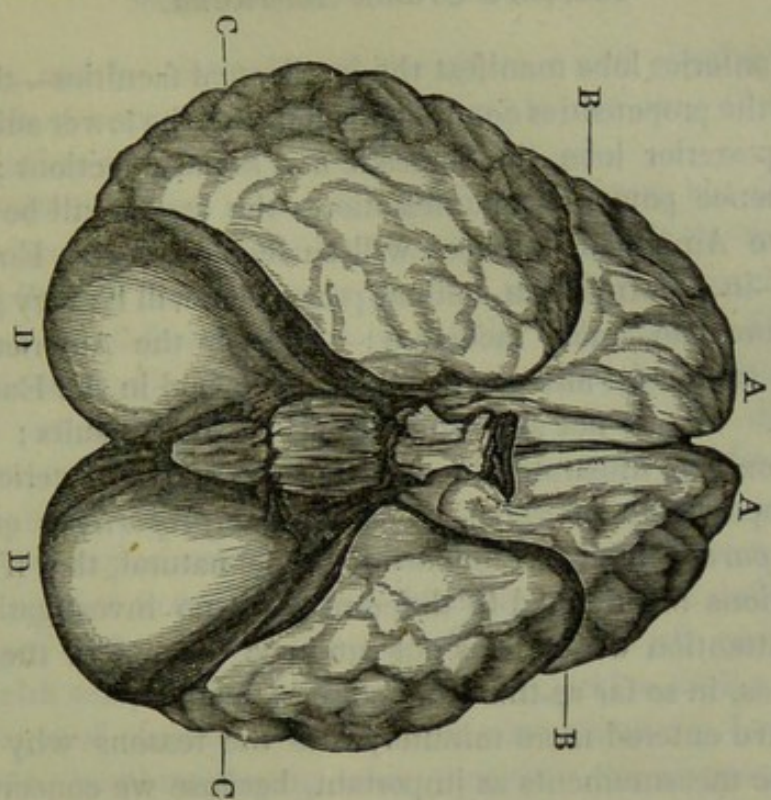
† Van Swieten, I, 454.

‡ Rapports du Physique et du Moral de l'Homme, 2de Edit. I, 233, 4.

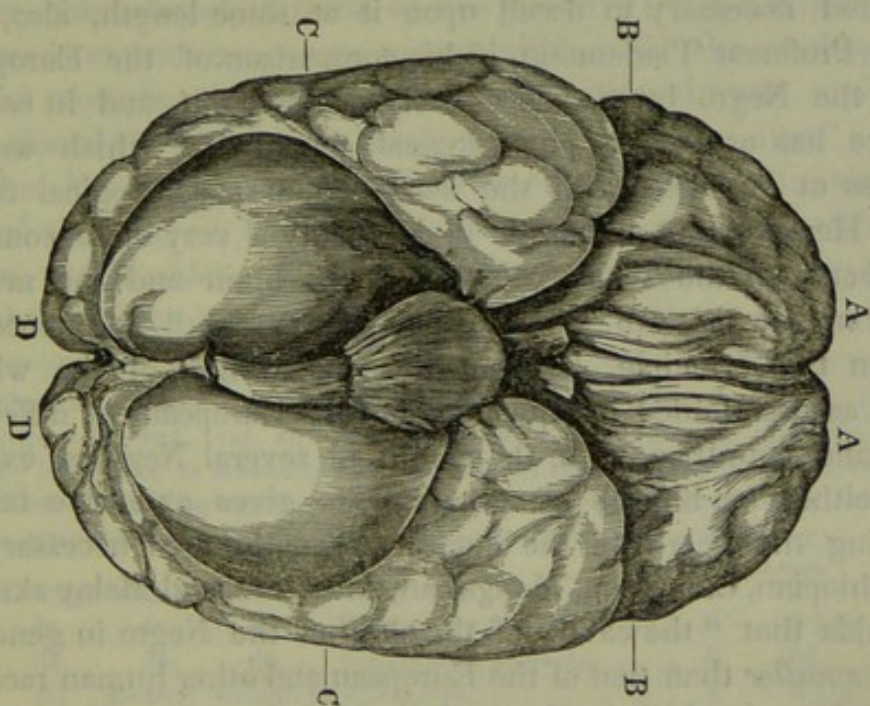
§ Anatomie comparée, tome II.

|| Rapport Historique sur les Progrès des Sciences Naturelles, &c. p. 193.

AMERICAN INDIAN, Fig. 1.



EUROPEAN, Fig. 2.



Inches 1 2 3 4 5 6 7 8

If the anterior lobe manifest the intellectual faculties—the middle lobe, the propensities common to man with the lower animals—and the posterior lobe, the domestic and social affections; and if size influence power of manifestation—the result will be that in the native American, intellect will be feeble—in the European, strong;—in the American, animal propensity will be very great—in the European, more moderate;—while in the American, the domestic and social affections will be feeble, and in the European, powerful. We do not state these as established results; we use the cuts only to illustrate the fact that the native American and the European brains *differ widely in the proportions of their different parts*;* and the conclusion seems natural, that if different functions be attached to different parts, no investigation can deserve attention which does not embrace the size of the different regions, in so far as this can be ascertained.

We have entered more minutely into the reasons why we regard these measurements as important, because we conceive that the distinguishing excellence of Dr. Morton's work consists in his having adopted and followed out this great principle. It appeared necessary to dwell upon it at some length, also, because Professor Tiedemann, in his comparison of the European with the Negro brain, has entirely neglected it, and in consequence has arrived at physiological conclusions which we regard as at variance with the most certain psychological facts, viz. He says that "there is undoubtedly a very close connection between the ABSOLUTE SIZE of the brain and the INTELLECTUAL POWERS AND FUNCTIONS of the mind;" and proceeding on this principle, he compares the weight of the whole brain, as ascertained in upwards of fifty Europeans of different ages and countries, with its weight in several Negroes, examined either by himself or others. He gives extensive tables showing the weight of the quantity of millet seed necessary to fill Ethiopian, Caucasian, Mongolian, American, and Malay skulls; and adds that "the cavity of the skull of the Negro in general, *is not smaller* than that of the European and other human races." The inference which he draws, is that *intellectually* and *morally*, as well as anatomically, the Negro is naturally on a par with the

* From inspecting numerous crania of both races, we cannot doubt of the general truth of this proposition.

European ; and he contends that the opposite and popular notion is the result of superficial observation, and is true only of certain degraded tribes on the *coast* of Africa.*

We entertain a great respect for Prof. Tiedemann, but we cannot subscribe to his principle that the whole brain is the measure of the *intellectual* faculties ; a proposition which assumes that the animal and moral feelings have no seat in this organ. He does not grapple with Dr. Gall's facts or arguments, but writes as if Gall had never existed. Dr. Morton has followed a different course, and we think wisely. He says, "I was from the beginning, desirous to introduce into this work, a brief chapter on phrenology ; but, conscious of my own inability to do justice to the subject, I applied to a professional friend to supply the deficiency. He engaged to do so, and commenced his task with great zeal ; but ill health soon obliged him to abandon it, and to seek a distant and more genial climate. Under these circumstances, I resolved to complete the phrenological table, and omit the proposed essay altogether. Early in the present year, however, and just as my work was ready for the press, George Combe, Esq., the distinguished phrenologist, arrived in this country ; and I seized the occasion to express my wants to that gentleman, who, with great zeal and promptness, agreed to furnish the desired essay, and actually placed the MS. in my hands before he left the city." He adds that Mr. Combe provided his memoir without having seen a word of the MS. of the work, or even knowing what had been written, and besides, owing to previous arrangements, he was limited to a given number of pages.

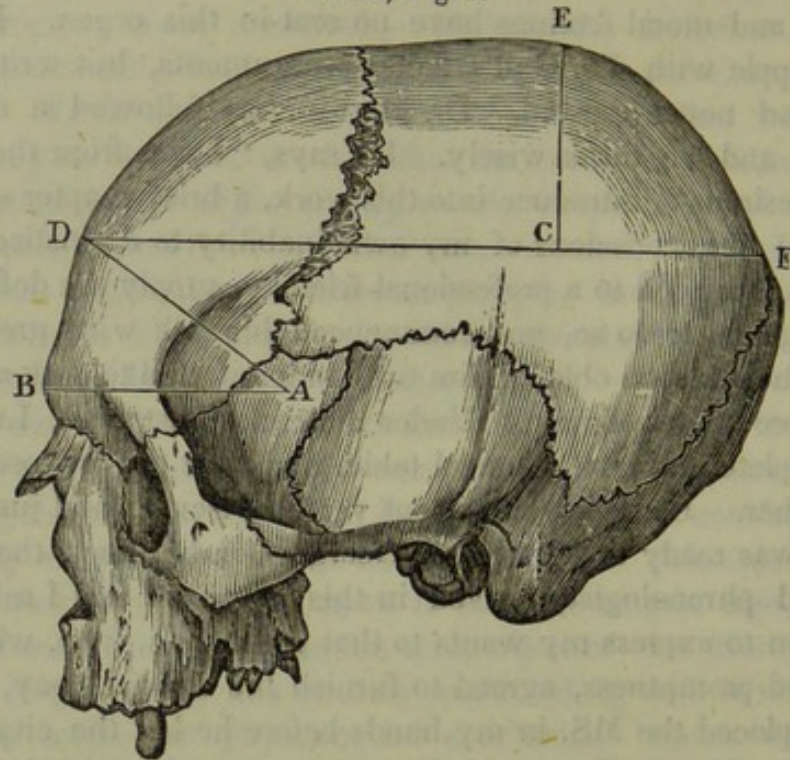
* Tiedemann's Essay has been critically examined by Dr. A. Combe, in the *Phrenological Journal*, (vol. xi,) who shows not only the error of principle committed by the author in assuming the whole brain to be the organ exclusively of the *intellectual* faculties, but the more striking fact that Tiedemann's own tables refute his own conclusions. Tiedemann's measurements are the following :

				Inches.	Lines.
Average length of brain in 4 Negroes,				5	11
do. do. do. 7 European males,				6	2 1-7
do. do. do. 6 European females,				5	10½
do. greatest breadth in 4 Negroes,				4	8 1-6
do. do. do. 7 European males,				5	1 1-7
do. do. do. 3 European females,				5	4½
do. height of brain in 3 Negroes,				2	11½
do. do. do. 7 European males,				3	4
do. do. do. 4 European females,				2	9½

The inferiority of the Negro brain in size, is self-evident from these dimensions.

We can afford space only to notice Mr. Combe's illustration of the location of the great divisions of the faculties in the different regions of the brain. It is necessary to give this in order to render the true import of several of Dr. Morton's measurements and results intelligible to the reader.

SWISS, Fig. 3.



All the figures are drawn to the same scale.

In this figure (Fig. 3,) a line drawn from the point A transversely across the skull, to the same point on the opposite side, would coincide with the posterior margin of the super-orbital plate: the anterior lobe rests on that plate. The line A B, denotes the length of the anterior lobe from back to front, or the portion of brain lying between A A and B B in figures 1 and 2. A in figure 3, "is located in the middle space between the edge of the suture of the frontal bone and the edge of the squamous suture of the temporal bone, where these approach nearest to each other, on the plane of the super-ciliary ridge." We have examined a Peruvian skull of the Inca race, a skull of a flat-headed Indian, an Indian skull found near Boston, and compared them with several skulls of the Anglo-Saxon race, and observe that the line A B, is considerably longer in the latter than in the former, and that it corresponds with the length of the ante-

rior lobe, as denoted by the super-orbital plate. The point C is the centre of ossification of the parietal bone, corresponding to the centre of Cautiousness. The line C D is drawn from C through the center of ossification in the left side of the frontal bone. This is the centre of Causality. E corresponds with Firmness of the phrenologist. The space D A B is an approximation to the department occupied by the intellectual faculties. D C E contains the organs of the moral sentiments. All the space behind A and below the line D C F is devoted to the animal organs. The space E C F contains Self-Esteem and Love of Approbation, which may act either with the moral sentiments or animal propensities, according as either predominate. Mr. Combe states that these lines are only approximations to accurate demarcations of the regions, as no modes of rigid admeasurement have yet been discovered.

Mr. Phillips invented an instrument, (which he describes,) by which Dr. Morton and he measured the contents of the space above D C F in cubic inches, in nearly all the skulls. This is called the *coronal region*. By deducting the contents of this space from the contents of the whole skull, they give the measurement of the *subcoronal region*. Mr. Phillips found it impossible to measure D A B and the space behind A and below D C F in cubic inches, and Dr. M. therefore measured, as an approximation, the whole space contained in the skull anterior to the anterior margin of the foramen magnum. He designates this the *anterior chamber*. He measured all behind that margin, and calls it the *posterior chamber*.

In addition to these, Mr. Phillips has added tables of thirty nine phrenological measurements, (which are lucidly described by him,) of each skull. We quote the following statement as an example of the spirit of philosophical enquiry, which animated Mr. Phillips in his labors. "A series of measurements with the craniometer and compasses, much more extensive than any we had seen published, had been carefully made on upwards of ninety of the crania, when Mr. George Combe arrived in this city. That gentleman immediately pointed out so many erroneous points of measurement, (arising from the use of a badly marked bust,) that those tables *were condemned*, together with the labor bestowed on them," and new measurements of the whole were substituted in their place!

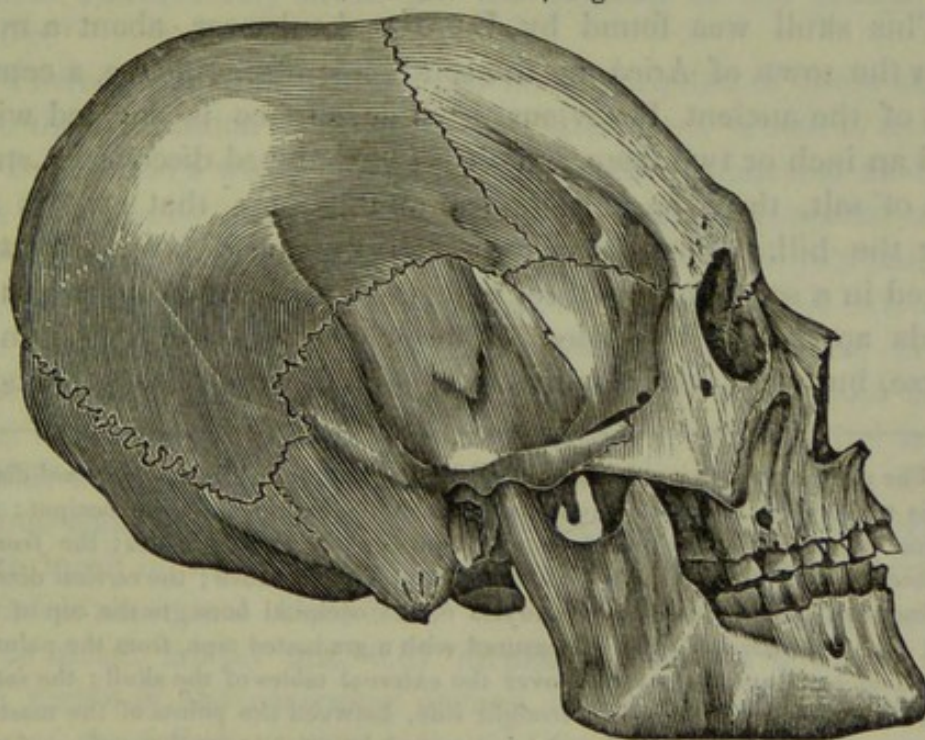
It is impossible to commend too highly the zeal and perseverance manifested by both of these gentlemen in their endeavors to do justice to their subject; and we anticipate that their example, and the results to which their labors have led, will give a powerful impulse to others to prosecute this interesting branch of science.

We shall now present a brief view of the manner in which Dr. Morton applies his own principles, and of some of the conclusions at which he has arrived.

He divides the native American nations into two great families, the *Toltecan* and *American*. "It is in the intellectual faculties, says he, that we discover the greatest difference between them. In the arts and sciences of the former we see the evidences of an advanced civilization. From the Rio Gila in California, to the southern extremity of Peru, their architectural remains are every where encountered to surprise the traveller and confound the antiquary; among these are pyramids, temples, grottoes, bas-reliefs and arabesques; while their roads, aqueducts, and fortifications, and the sites of their mining operations, sufficiently attest their attainments in the practical arts of life." p. 84. The desert of Atacama divides the kingdom of Peru from that of Chil , and is nearly a hundred miles in length. A river, abounding in salt, runs through it. This desert was the favorite sepulchre of the Peruvian nations for successive ages. The climate, salt and sand, dry up the bodies, and the remains of whole generations of the former inhabitants of Peru may now be examined, after the lapse perhaps of thousands of years. Dr. Morton has been enabled to examine nearly one hundred Peruvian crania, and concludes that that country has been, at different times, peopled by two nations of differently formed crania, one of which is perhaps extinct, or at least exists only as blended by adventitious circumstances, in very remote and scattered tribes of the present Indian race. "Of these two families, that which was antecedent to the appearance of the Incas is designated as the *ancient Peruvian*, of which the remains have been found only in Peru, and especially in that division of it now called Bolivia. Their tombs, according to Mr. Pentland, abound on the shores and islands of the great Lake Titicaca, in the inter-alpine valley of the Desaguadera, and in the elevated valleys of the Peruvian Andes, between the latitudes of 14  and 19  30' South." Our knowledge of their physical appearance is

derived solely from their tombs. They were not different "from cognate nations in any respect except in the conformation of the head, which is small, greatly elongated, narrow in its whole length, with a very retreating forehead, and possessing more symmetry than is usual in skulls of the American race. The face projects, the upper jaw is thrust forward, and the teeth are inclined outward. The orbits of the eyes are large and rounded, the nasal bones salient, the zygomatic arches expanded; and there is a remarkable simplicity in the sutures that connect the bones of the cranium." p. 97. Dr. Morton presents the following cranium, plate IV of his series, "as an illustrative type of the cranial peculiarities of the people;" and he is of opinion that the form is "natural, unaltered by art."

ANCIENT PERUVIAN, Fig. 4.



He gives the following description of this cranium :

"Though the forehead retreats rapidly, there is but little expansion at the sides, and from the face to the occiput, inclusive, there is a narrowness that seems characteristic of the race. The posterior view represents the skull elevated in that region, without any unnatural width at the sides, and the vertical view sufficiently confirms the latter fact.

MEASUREMENTS.*

Longitudinal diameter,		7.3 inches.
Parietal do.		5.3 do.
Frontal do.		4.3 do.
Vertical do.		5.3 do.
Inter-mastoid arch,		14. do.
Inter-mastoid line,		4.3 do.
Occipito-frontal arch,		15. do.
Horizontal periphery,		19.8 do.
Extreme length of head and face,		8.2 do.
Internal capacity,		81.5 cubic inches.
Capacity of the anterior chamber,		31.5 do.
Capacity of the posterior chamber,		50. do.
Capacity of the coronal region,		16.25 do.
Facial angle,		73 degrees."

This skull was found by Dr. Ruschenberger, about a mile from the town of Arica, on the south side of the *morro*, a cemetery of the ancient Peruvians. "The surface is covered with sand an inch or two deep, which being removed discovers a stratum of salt, three or four inches in thickness, that spreads all over the hill. The body (to which this head belonged) was placed in a squatting posture, with the knees drawn up and the hands applied to the sides. The whole was enveloped in a coarse, but close fabric, with stripes of red, which has withstood,

* The measurements are thus described by Dr. Morton. The *longitudinal* diameter is taken from the most prominent part of the os frontis to the occiput; the *parietal* diameter from the most distant points of the parietal bones; the *frontal* diameter from the anterior inferior angles of the parietal bones; the *vertical* diameter from the fossa, between the condyles of the occipital bone, to the top of the skull; the *inter-mastoid arch* is measured with a graduated tape, from the point of one mastoid process to the other, over the external tables of the skull; the *inter-mastoid line* is the distance, in a straight line, between the points of the mastoid processes; the *occipito-frontal arch* is measured by a tape over the surface of the cranium, from the posterior margin of the foramen magnum to the suture, which connects the os frontis with the bones of the nose; the *horizontal periphery* is measured by passing a tape around the cranium so as to touch the os frontis immediately above the superciliary ridges, and the most prominent part of the occipital bone; the *length of the head and face* is measured from the margin of the upper jaw, to the most distant point of the occiput; the *zygomatic diameter* is the distance, in a right line, between the most prominent points of the *zygomæ*; the *facial angle* is ascertained by an instrument of ingenious construction and easy application, invented by Dr. Turnpenny, and described by Dr. Morton. Dr. Morton took nearly all the anatomical measurements with his own hands.

wonderfully, the destroying effects of ages, for these interments were made before the conquest, although at what period is unknown."

Dr. Morton states that the average internal capacity of the Caucasian or European head, is at least 90 cubic inches. In three adult ancient Peruvians, it is only 73. The mean capacity of the anterior chamber is about one half of that of the posterior, or 25 to 47, while the mean facial angle is but 67 degrees.

"It would," he continues, "be natural to suppose, that a people with heads so small and badly formed, would occupy the lowest place in the scale of human intelligence. Such, however, was not the case." He considers it ascertained that "civilization existed in Peru anterior to the advent of the Incas, and that those anciently civilized people constituted the identical nations whose extraordinary skulls are the subjects of our present inquiry."

There is a discrepancy between this description of these skulls and the civilization ascribed to their possessors, which is unique in Dr. Morton's work. In every other race, ancient and modern, the coincidence between superior cranial forms and superior mental qualities, is conspicuous. On turning to Mr. Phillips's phrenological measurements, however, we find that the *mean* extent of the forehead in this skull, from the point A on one side, to the same point on the other, over B, or the "inter-sphenoidal arch, over the *perceptive* organs," (as ascertained by a graduated tape,) is 6.37 inches; and the mean extent from A to A, over D, or the "inter-sphenoidal arch over the *reflective* organs," is 6.12 inches. The mean of the same measurements of "100 *unaltered* crania of adult aboriginal Americans," of which many are ascertained to be males, are 6.7 and 6.87 inches; showing a superiority in the region of the *observing organs* in the ancient race, and in that of the *reflecting organs* in the modern. This indicates a larger quantity of brain in the anterior lobe in the extinct race, than Dr. Morton's description leads us to infer. This subject obviously requires further elucidation.

If these skulls had been compressed by art, we could have understood that certain portions of the brain might have been only displaced, but not destroyed. The spine, for instance, may be bent, as in hump-back, yet retain its functions; and we might suppose the anterior lobe, in cases of compression, to be

developed laterally, or backwards, and still preserve its identity and uses. This, indeed, is Dr. Morton's own conclusion, in regard to the brain in the flat-headed Indians. He gives an interesting and authentic description of the instrument and process by means of which the flat-head tribes of Columbia River compress the skull, and remarks that "besides the depression of the head, the face is widened and projected forward by the process, so as materially to diminish the facial angle; the breadth between the parietal bones is greatly augmented, and a striking irregularity of the two sides of the cranium almost invariably follows; yet the absolute internal capacity of the skull is not diminished, and, strange as it may seem, the intellectual faculties suffer nothing. The latter fact is proved by the concurrent testimony of all travellers who have written on the subject." Dr. Morton adds, that in January, 1839, he was gratified with a personal interview with a full blood Chenouk, in Philadelphia. He is named William Brooks, was 20 years of age, had been three years in charge of some Christian missionaries, and had acquired great proficiency in the English language, which he understood and spoke with a good accent and general grammatical accuracy. His head was as much distorted by mechanical compression, as any skull of his tribe in Dr. Morton's possession. "He appeared to me," he adds, "to possess more mental acuteness than any Indian I had seen, was communicative, cheerful, and well mannered." The measurements of his head were these: longitudinal diameter, 7.5 inches; parietal diameter, 6.9 inches; frontal diameter, 6.1 inches; breadth between the cheek bones, 6.1 inches; facial angle, about 73 degrees. Dr. Morton considers it certain that the forms of the skull produced by compression, never become congenital, even in successive generations, but that the characteristic form is always preserved, unless art has directly interfered to distort it. pp. 206, 207.*

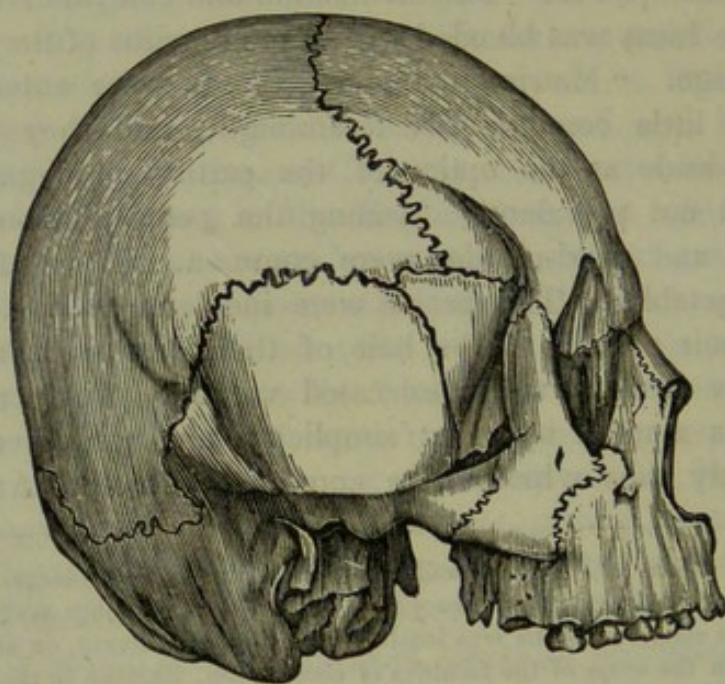
* Mr. George Combe, in his late lectures in New Haven, mentioned, that in May, 1839, he had been introduced, in New York, to the Rev. Jason Lee, who had been a missionary among the Indians, 2000 miles beyond the Rocky Mountains, and who had with him Thomas Adams, a young Indian of about 20 years of age, of the Cloughewallah tribe, located about 25 miles from the Columbia River. This young man's head had been compressed by means of a board and cushions, in infancy. Mr. C. examined his head, and found that the parietal was actually greater than the frontal and occipital diameter. The organs in the superciliary ridge of the forehead were fully developed; the upper part of the forehead was flat and

The extinct race in Peru, was succeeded by the "INCA, OR MODERN PERUVIANS." This race dates its possession of Peru from about the eleventh century of our era; and as this period corresponds with the epoch of the migration from Mexico of the Toltecas, the most civilized nation of ancient Mexico, Dr. Morton concurs in the opinion expressed by other authors, that the modern Peruvians were of a common origin with the ancient Mexicans. "The modern Peruvians," says he, "differ little in person from the Indians around them, being of the middling stature, well limbed, and with small feet and hands. Their faces are round, their eyes small, black, and rather distant from each other; their noses are small, the mouth somewhat large, and the teeth remarkably fine. Their complexion is a dark brown, and their hair long, black, and rather coarse." p. 115. The civilization and comparative refinement of the Incas was blended with some remains of the ferocity of the savage. "Matrimonial engagements were entered into with very little ceremony or forethought, and they were as readily set aside at the option of the parties. Polygamy was lawful, but not prevalent." Among the people, incontinence, sensuality, and child-murder were common. Their diet was chiefly vegetables. The people were indolent, filthy and negligent in their persons. The hair of their mummies, in many instances, is charged with desiccated vermin. Their religious system was marked by great simplicity, and was divested of those bloody rites which were common with the Aztecs of

deficient; his organs of language and form, said Mr. C., were large. He had studied the English language for two years, and spoke it tolerably well. Mr. C. added, that in conversation he was intelligent, ready, and fluent, on all subjects that fell within the scope of the faculties of observation, situated in the superciliary ridge, but dull, unintelligent, and destitute equally of ideas and language, on topics that implied the activity of the reflecting faculties, situated in the upper part of the forehead. Mr. C. considered his mental powers to be in direct harmony with the development of his brain. We record this observation, because it is obvious, that if different parts of the brain manifest different faculties, it is indispensable that observations on the *manifestations* of the mental powers should be equally minute and discriminative with those on the development of particular portions of the cranium. Mr. C. added, that the only way to ascertain whether the brain was merely displaced by compression, or otherwise altered, was by careful examination after death; and that he had recommended to Mr. Lee to call the attention of any medical men who might visit these Indians, to this subject. We observed the death of one of these flat-headed Indians mentioned as having occurred in New York. Did any of the phrenologists or anti-phrenologists examine the brain? It was an excellent opportunity for Dr. Rees.

Mexico. They believed in one God, whom they called Viracocha, in the immortality of the soul, and in rewards and punishments in the next life. They worshipped both the sun and moon, in whose honor they erected temples and formed idols. They consecrated virgins, in the same manner as practised in modern convents. Their funeral rites were barbarous and cruel : when their chief men died, they buried a number of human victims, women, boys and servants, to attend on the departed in the next world. They were conquered by Pizarro with a force which consisted of 62 horsemen and 102 foot soldiers. p. 124. The following is given as a strikingly characteristic Peruvian head.

MODERN PERUVIAN, Fig. 5.



"The skull in these people," says Dr. Morton, "is remarkable for its small size, and for its quadrangular form. The occiput is greatly compressed, sometimes absolutely vertical ; the sides are swelled out, and the forehead is somewhat elevated, but very retreating. The skulls are remarkable for their irregularity. The dimensions of this skull are as follows :

Longitudinal diameter,		6.1 inches.
Parietal do.		6. do.
Frontal diameter,		4.7 do.
Vertical do.		5.5 do.

Inter-mastoid arch,		16.	inches.
Inter-mastoid line,		4.5	do.
Occipito-frontal arch,		14.1	do.
Horizontal periphery,		19.5	do.
Internal capacity,		83.	cubic inches.
Capacity of the anterior chamber,		33.5	do.
Capacity of the posterior chamber,		49.5	do.
Capacity of the coronal region,		15.75	do.
Facial angle,		81	degrees."

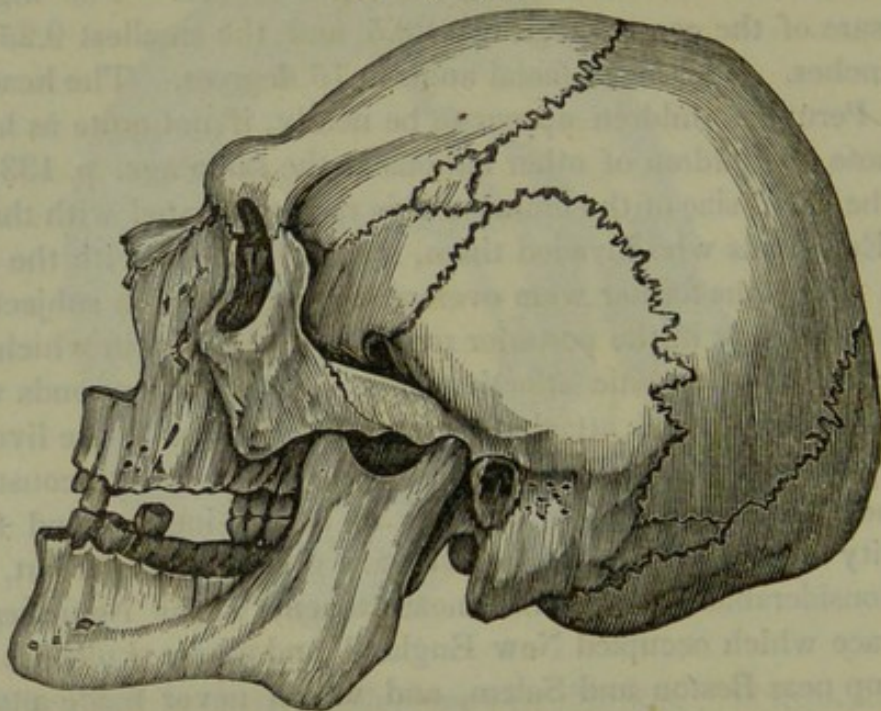
Dr. Morton gives the result of the measurement of twenty-three adult skulls of the pure Inca race. "The mean of the internal capacity is 73 cubic inches, which is probably lower than that of any other people now existing, not excepting the Hindoos." The mean of the anterior chamber is 32, of the posterior, 42, of the coronal region, 12 cubic inches. The highest measure of the coronal region is 20.5, and the smallest 9.25 cubic inches. The mean facial angle is 75 degrees. The heads of nine Peruvian children appear to be nearly, if not quite as large, as those of children of other nations at the same age. p. 133.

The small size of the brains of this race, compared with that of the Europeans who invaded them, is in accordance with the ease with which the former were overcome and retained in subjection. The deficiency in the posterior region of the brain, in which the organs of the domestic affections are situated, corresponds with their feeble conjugal attachment and indifference to the lives of their children. The diameter from constructiveness to constructiveness, is stated by Mr. Phillips to be 4.5 inches, and from ideality to ideality, 5.1. These organs give a talent for art, and are considerable. The same measurements in the Naumkeagh, the race which occupied New England, and whose skulls are still dug up near Boston and Salem, and which never made any attainments in the arts, are 4.1 and 4 inches, respectively. Dr. Robertson, in his history of America, mentions that the modern Peruvian race was distinguished for its extraordinary powers of concealment and secrecy. Mr. Phillips states the breadth from secretiveness to secretiveness to be 5.6 inches, which is large; the longitudinal diameter is only 6.1. The region of combativeness also appears to be deficient in these skulls.

The Iroquois confederacy, consisted originally of five nations, the Mohawks, Oneidas, Onondagas, Cayugas and Senecas. They

were intellectually superior to the surrounding nations, passionately devoted to war, and victorious over the other tribes. They forced their women to work in the field and carry burdens; they paid little respect to old age, were not much affected by love, were regardless of connubial obligations, and addicted to suicide. "They were proud, audacious, and vindictive, untiring in the pursuit of an enemy, and remorseless in the gratification of their revenge. Their religious ideas were vague, and their cautiousness and cunning proverbial. They were finally subdued and nearly exterminated by the Anglo-Americans in 1779. Some miserable remnants of them, ruined by intoxicating liquors, still exist in the state of New York." The following is the skull of a Huron, one of these nations.

HURON, Fig. 6.

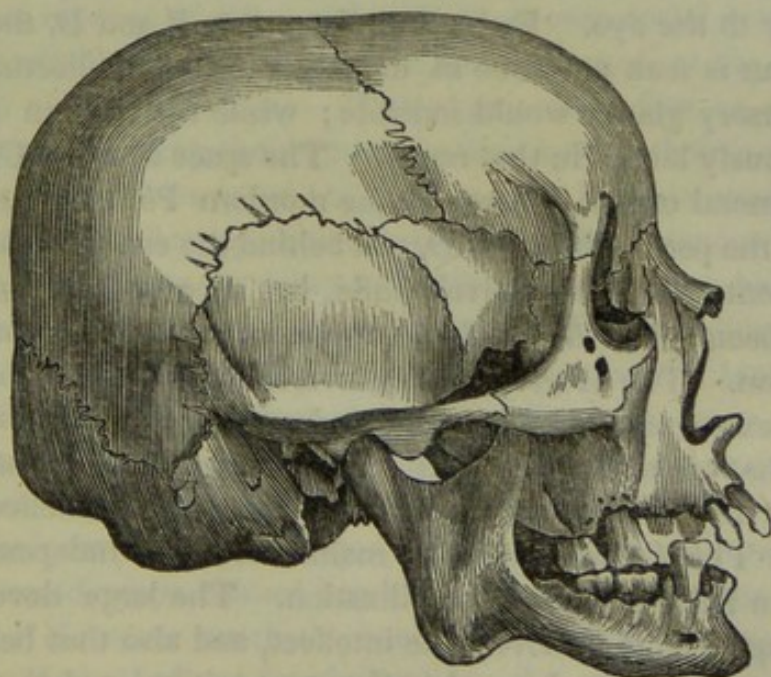


The following are *average* measurements of the five skulls of these nations given by Dr. Morton: internal capacity, 88; coronal region, 15; anterior chamber, 31.5; posterior chamber, 50 cubic inches.

The ARAUCANIANS are the most celebrated and powerful of the Chilian tribes. They inhabit the region between the rivers Bio-bio and Valdivia, and between the Andes and the sea, and derive their name from the province of Arauco. "They are a robust

and muscular people, of a lighter complexion than the surrounding tribes. Endowed with an extraordinary degree of bodily activity, they reach old age with few infirmities, and, generally, retain their sight, teeth, and memory, unimpaired. They are brave, discreet, and cunning to a proverb, patient in fatigue, enthusiastic in all their enterprises, and fond of war as the only source of distinction." "Their vigilance soon detected the value of the military discipline of the Spaniards, and especially the great importance of cavalry in an army; and they lost no time in adopting both these resources, to the dismay and discomfiture of their enemies. Thus in seventeen years after their first encounter with Europeans, they possessed several strong squadrons of horse, conducted their operations in military order, and, unlike the Americans generally, met their enemies in the open field." "They are highly susceptible of mental culture, but they despise the restraints of civilization, and those of them who have been educated in the Spanish colonies, have embraced the first opportunity to resume the haunts and habits of their nation." p. 241. The following is one of three Araucanian skulls delineated in the work.

ARAUCANIAN, Fig. 7.



The average measurements of the three skulls are as follows: internal capacity, 79; coronal region, 15.4; anterior chamber 32.2; posterior chamber, 48.50.

The measurements of the *anterior* and *posterior* chambers, as we have already mentioned, (p. 359,) are not in accordance with any phrenological rule. The anterior embraces the whole intellect, a portion of the moral sentiments, and a portion of the animal propensities; while the posterior chamber includes the remainder of the animal propensities and the remainder of the moral organs. The measurement of the internal capacity, is free from all objection; and that of the coronal region approaches to correctness; but the first gives merely the aggregate size of all the organs, animal, moral, and intellectual; and the second that of the moral organs, with a portion of the intellectual organs, and also a portion of the organs common to man with the lower animals. The phrenological measurements given by Mr. Phillips may probably afford more correct means of comparing one portion of the brain with another, in the different nations, but our limits prevent us from analyzing them. Unfortunately also the letter-press titles to his columns are printed up-side down, which renders it exceedingly laborious to consult them. We, therefore, only remark that the application of lines delineated by Mr. Combe on the skull Figure 1, to those specimens, brings out the relation between the mental character and cranial development pretty forcibly to the eye. Estimating from A to B and D, the ancient Peruvian is seen not to be so defective in the intellectual region as a cursory glance would indicate; while the modern Peruvian is obviously larger in that region. The space above D C, devoted to the moral organs, is large in the modern Peruvian in proportion to the portion below C D, and behind the ear. This race was intelligent, and comparatively mild, but superstitious and feeble. It has been subdued by the Europeans, and lives under their dominion. The Hurons, always averse to civilization, have been nearly exterminated. The preponderance of the region below C D, (that of the animal propensities,) in them is conspicuous, combined with relative deficiency in the moral and intellectual regions. The Araucanians have maintained their independence in the open field, but resisted civilization. The large development of the space A B C, devoted to intellect, and also that below C D and behind the ear, devoted to the propensities, is obvious, while the space above C D, or the region of the moral organs, is proportionally deficient. This indicates great animal and intellectual power, with imperfectly evolved moral feelings. To the latter

defect, probably is to be ascribed their aversion to civilized habits. The inferiority of all of these skulls to that of the Swiss is conspicuous. The internal capacity of it is 95.5, and that of the coronal region, 21.25. Dr. Morton does not give the capacity of the anterior and posterior chambers of this skull, but the larger dimensions of the intellectual organs have already been stated.

We have no space to enter into any description of the skulls found in the ancient tombs, or of those of the Flat-headed Indians and Charibs; suffice it to say that Dr. Morton's materials are full and satisfactory on these topics, and his facts and conclusions highly interesting. We subjoin a few of the general results at which he arrives from a survey of his entire field.

"The intellectual faculties," says he, "of the great AMERICAN FAMILY, appear to be of a decidedly inferior cast, when compared with those of the Caucasian or Mongolian races. They are not only averse to the restraints of education, but for the most part incapable of a continued process of reasoning on abstract subjects. Their minds seize with avidity on simple truths, while they at once reject whatever requires investigation and analysis. Their proximity, for more than two centuries, to European institutions, has made scarcely any appreciable change in their mode of thinking or their manner of life; and as to their own social condition, they are probably in most respects what they were at the primitive epoch of their existence. They have made few or no improvements in building their houses or their boats; their inventive and imitative faculties appear to be of a very humble grade, nor have they the smallest predilection for the arts or sciences. The long annals of missionary labor and private benefaction bestowed upon them, offer but very few exceptions to the preceding statement, which, on the contrary, is sustained by the combined testimony of almost all practical observers. Even in cases where they have received an ample education, and have remained for many years in civilized society, they lose none of their innate love of their own national usages, which they have almost invariably resumed when chance has left them to choose for themselves." "However much the benevolent mind may regret the inaptitude of the Indians for civilization, the affirmative of this question seems to be established beyond a doubt. His moral and physical nature are alike adapted to his position among the races of men, and it is as reasonable to expect the one to be changed

as the other. The structure of his mind appears to be different from that of the white man, nor can the two harmonize in their social relations except on the most limited scale. Every one knows, however, that the mind expands by culture; nor can we yet tell how near the Indian would approach the Caucasian after education had been bestowed on a single family through several successive generations." p. 82.*

The following are parts of Dr. Morton's table of "mean results," given from his whole measurements.

	Toltecan nations, and skulls from mounds.		Barbarous nations, with skulls from the valley of Ohio.		American race, embracing Toltecan and barbarous nations.		Flathead tribe of Columbia river.		Ancient Peruvians.	
	No. of skulls.	Mean.	No. of skulls.	Mean.	No. of skulls.	Mean.	No. of skulls.	Mean.	No. of skulls.	Mean.
Internal capacity in cubic inches,	57	76.8	87	82.4	144	79.6	8	79.25	3	73.2
Capacity of anterior chamber,	46	32.5	73	34.5	119	33.5	8	32.25	3	25.7
Capacity of posterior chamber,	46	43.8	73	48.6	119	46.2	8	47.00	3	47.4
Capacity of coronal region,	46	14.0	71	16.2	117	15.1	8	11.09	3	14.6
Capacity of sub-coronal region,	46	61.8	71	66.5	117	64.5	8	67.35	3	58.6

Remarks.—"The barbarous nations possess a larger brain by $5\frac{1}{2}$ cubic inches, than the Toltecan; while, on the other hand, the Toltecan possess a greater relative capacity of the anterior chamber of the skull, in the proportion of 42.3 to 41.8. Again, the coronal region, though absolutely greater in the barbarous tribes, is rather larger in proportion in the demi-civilized tribes; and the facial angle is much the same in both, and may be assumed, for the race, at 75 degrees.

"In conclusion, the author is of the opinion that the facts contained in this work tend to sustain the following propositions:

"1st. That the American race differs essentially from all others, not excepting the Mongolians; nor do the feeble analogies of language, and the more obvious ones, in civil and religious institutions and the arts, denote any thing beyond casual or colonial communication with the Asiatic nations; and even those analogies may perhaps be accounted for, as Humboldt has suggested, in the mere coincidence arising from similar wants and impulses in nations inhabiting similar latitudes.

* Dr. Morton adds that the Indians are extremely defective in comprehending every thing relating to numbers, and we may remark that Mr. Combe, in his lectures in New Haven, showed the great deficiency of the organ of number in their skulls.

"2d. That the American nations, excepting the polar tribes, are of one race and one species, but of two great families, which resemble each other in physical, but differ in intellectual character.

"3d. That the cranial remains discovered in the mounds from Peru to Wisconsin, belong to the same race, and probably to the Toltecan family." Dr. Morton subjoins the following

"NOTE on the internal capacity of the cranium in the different races of men. Having subjected the skulls in my possession, and such also as I could obtain from my friends, to the internal capacity measurement already described, I have obtained the following results. The mean of the American race (omitting fractions) is repeated here, merely to complete the table. The skulls of idiots, and persons under age, were of course rejected.

Races.	No. of skulls.	Mean internal capacity in cubic inch.	Largest in the series.	Smallest in the series.
1. Caucasian,	52	87	109	75
2. Mongolian,	10	83	93	69
3. Malay,	18	81	89	64
4. American,	147	80	100	60
5. Ethiopian,	29	78	94	65

"1st. The *Caucasians* were, with a single exception, derived from the lowest and least educated class of society. It is proper, however, to mention that but three *Hindoos* are admitted in the whole number, because the skulls of these people are probably smaller than those of any other existing nation. For example, seventeen *Hindoo* heads give a mean of but seventy-five cubic inches; and the three received into the table are taken at that average. To be more specific, we will give, in detail, the number of individuals of each nation, as far as ascertained.

Anglo-Americans,	6
German, Swiss and Dutch,	7
Celtic, Irish and Scots,	7
English,	4
Guanché, (Lybian,)	1
Spanish,	1
Hindoo,	3
Europeans not ascertained,	23
Total,	52

"2d. The *Mongolians* measured, consist of Chinese and *Eski-maux*, and what is worthy of remark, three of the latter give a mean of 86 cubic inches, while seven Chinese give but 82.

"3d. The Malays embrace Malays proper and Polynesians, thirteen of the former and five of the latter; and the mean of each presents but a fractional difference from the mean of all.

"4th. The *Ethiopians* were all unmixed negroes, and nine of them native Africans, for which I am chiefly indebted to Dr. McDowell, formerly attached to the colony at Liberia.*

"5th. Respecting the American race, I have nothing to add, excepting the striking fact that of all the American nations, the Peruvians had the smallest heads, while those of the Mexicans were something larger, and those of the barbarous tribes the largest of all, viz.

Toltecan nations,	{	Peruvians collectively,	76 cub. inch.
		Mexicans collectively,	79 do.
		Barbarous tribes, as per table,	82 do.

"An interesting question remains to be solved, viz. the relative proportion of brain in the anterior and posterior chambers of the skull in the different races; an inquiry for which I have hitherto possessed neither sufficient leisure nor adequate materials." p. 261.

We now add Dr. Morton's statement in his prefatory letter to Mr. Phillips. "I am free to acknowledge," says he, "that there is a singular harmony between the mental character of the Indian, and his cranial developments, as explained by phrenology."

Our readers will discover in the length and minuteness of this article, the great value which we attach to Dr. Morton's work. We regard it as an honor to the country, and as a proof of talent, patience, and research in himself, which place him in the first rank among natural philosophers. We rejoice to see that he does "not, even now, consider his task as wholly completed;" but hopes to publish a "supplementary volume, in which it will fur-

* Dr. Morton states the mean internal capacity of the European, or Caucasian skulls, to be 87, and of the Ethiopian, or Negro race, to be 78 cubic inches. We observe that Dr. Andrew Combe, in his "Remarks on the Fallacy of Professor Tiedemann's Comparison of the Negro brain and intellect with those of the European," arrives at results coinciding with those obtained by Dr. Morton. Tiedemann gives the weight of only four Negro brains. "The average European," he says, "runs from 3 lbs. 2 oz. to 4 lbs. 6 oz.; while the average of the four Negro brains rises to only 3 lbs. 5 oz. 1 dr.; or 3 oz. above the lowest European averages; and the highest Negro falls 5 oz. short of the highest average European, and no less than 10 oz. short of Cuvier's brain." Phren. Journ., Vol. XI. We have already shown, p. 357, that Tiedemann's linear dimensions of the European and Negro brain also contradict his theory of equality, and are in harmony with Dr. Morton's results.

ther be my aim to extend and revise both the anatomical and phrenological tables, and to give basal views of at least a part of the crania delineated." We sincerely trust that the favorable reception of this volume will induce him to execute these intentions. Valuable as the materials are in the present work, they lie very much apart. He wrote without systematic relation to phrenology; yet phrenological facts and inferences are presented *passim* throughout the work. Mr. Phillips's phrenological tables are extensive, minute and interesting, but they are not connected directly with the text; while Mr. Combe's essay was composed and printed without his having seen either the text of Dr. Morton, or the final results of Mr. Phillips's measurements. There is strong evidence, in this course of proceeding, of a very direct love of truth, and a reliance on all its parts harmonizing with each other; but much of the effect and instruction are lost to the reader, in consequence of the facts and principles not being brought into juxtaposition by the respective contributors. We shall expect this defect to be supplied in the next edition, which we do not doubt will be called for. The work is remarkably cheap, keeping in view the quantity and quality of the *materiel* of which it is composed.*

* *Postscript*.—On page 363, we remarked that "there is a discrepancy between the description of the ancient Peruvian skulls, and the civilization ascribed to their possessors, which is unique in Dr. Morton's work." When the present sheet was in the press, we received a letter from Dr. Morton, in which he says, "Since that part of my work which relates to the *ancient Peruvians* was written, I have seen several additional casts of skulls belonging to the same series, and although I am satisfied that Plate IV, (Fig. 4, p. 361,) represents an unaltered cranium, yet, as it is the *only unaltered one* I have met with, among the remains of that ancient people, I wish to correct the statement, too hastily drawn, that it is the *cranial type* of their nation. My matured opinion is, that the ancient Peruvians were a branch of the great Toltecan family, and that the cranium had the same general characteristics in both. I am at a loss to conjecture how they *narrowed the face* in such due proportion to the head; but the fact seems indisputable. I shall use every exertion to obtain additional materials for the farther illustration of this subject."

Signed,

SAMUEL GEORGE MORTON.

Philadelphia, March 3, 1840.

Dr. Morton requests us also to subjoin the following note: "The author has published five hundred copies of his work, which he nominally divides into two editions, the American and the Foreign. They differ in nothing but the dedication; the American copies being dedicated to Dr. Ruschenberger and Mr. J. S. Phillips—the Foreign copies to Dr. Prichard and James Morton, Esq., the author's uncle. In the Foreign copies, the letter to Mr. Phillips is inserted at the end of the volume."

From the Foreign Review
London. March 1830.

To Dr. Craigie

with kindest compliments
from the author.

- ART. III.—1. *Tableau Elémentaire de l'Hist. Nat. des Animaux*, par G. Cuvier. Paris, 1798. 8vo. avec pl.
2. *Mémoires pour servir à l'Hist. et à l'Anat. des Mollusques*, par M. le Chevalier Cuvier. Paris, 1817. 4to. avec pl.
3. *Leçons d'Anatomie Comparée de G. Cuvier*. Paris, 1800—1805. 5 tomes, 8vo. avec pl.
4. *Recherches sur les Ossemens Fossiles*, 7 tomes 4to. Paris. (three editions) 1812, 1817, 1821. Par M. le Baron Cuvier, avec pl.
5. *Recueil des Eloges Historiques, &c.*, par M. le B. Cuvier. 3 tomes, 8vo. Paris, 1819—1827.
6. *Rapport Historique sur les Progrès des Sciences Naturelles*, par M. Cuvier. Paris, 1827. 1 tome 8vo.
7. *Histoire des Progrès des Sciences Naturelles*. Par M. le Baron Cuvier. 4 tomes, 8vo. Paris, 1829.
8. *Le Règne Animal distribué d'après son Organisation*, par M. le Chev. Cuvier. 4 tomes 8vo. Paris, 1817. avec pl.
9. *Le même Ouvrage, Nouvelle Edition*, 5 tomes, 8vo. Paris, 1829.
10. *Histoire Naturelle des Poissons*, par M. le Baron Cuvier et M. Valenciennes, tomes 1, 2, 3, 4. Paris, 1828—9. avec pl.

ALTHOUGH the study of Zoology is far from having yet acquired in Britain that scientific character which it has long held on the continent, there is obviously an increasing taste for the study of that interesting science, and a more general perception of its utility, since the exertions of the late Sir T. Stamford Raffles in its behalf. The zoological treasures imported from the East by that zealous patron of the science have enriched our previously existing collections and formed the nuclei of new museums, and his influence has extended to the establishment of new societies, menageries, and journals devoted to the advancement of Zoology. The Zoological Society of London, though instituted only four years ago, is already one of the most numerous and respectable scientific societies of
Great