ONGPATONGA.

[BIG ELK.]

CHIEF OF THE OMAWHAWS.

See page 292.

Drawn for Morton's Crania Americana by M.S.Weaver.

Lith. of T. Sinclair, N° 79 S. Third St. Phila

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

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PHILADELPHIA:
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TO

JOHN S. PHILLIPS, ESQ.

MEMBER OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA, &c., &c.

My Dear Sir:—Having now completed a task which has cost me some years of toil and anxiety, it gives me great pleasure to record the many obligations I owe you in the prosecution of these inquiries. To your ingenuity I am almost wholly indebted for the means of obtaining the elaborate measurements appended to this work; which, without your personal aid and untiring perseverance, would have remained in a great measure unaccomplished. It may, perhaps, be thought by some readers, that these details are unnecessarily minute, especially in the Phrenological Table; 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 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 inquiry, 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. Yet I am free to acknowledge that there is a singular harmony between the mental character of the Indian, and his cranial developments as explained by Phrenology.

This work has not been composed in that philosophic retirement which is so favorable to investigation and reflection: on the contrary, you can bear witness that I have pursued my course amidst the continued fatigue and anxiety of a professional life; and this must be my apology, if the work I now submit to the public does not embrace all the materials which are called for in such an undertaking.

I am, my dear sir,

Your very obliged friend and servant,

SAMUEL GEORGE MORTON.

PHILADELPHIA, *October* 1, 1839.

PREFACE.

The title of this work is perhaps sufficiently explanatory of its objects. The principal design 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, Natchez, and the tribes inhabiting the Oregon Territory. The author's materials in this department are ample, and have enabled him to give a full exposition of a subject which was long involved in doubt and controversy. Particular attention has been bestowed 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.

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 this city. It is with great

pleasure that I also record Mr. Combe's liberality in providing this memoir without having seen a word of my manuscript, or even knowing what I had written; at the same time that I was under the necessity, owing to certain pre-arrangements, of limiting him to a given number of pages, in which he acquiesced with the most obliging frankness. By means of this Essay, which is accompanied by two illustrative plates, the reader will be able to apply Phrenological rules to every skull in the series here figured.

Neither care nor expense has been spared in the endeavor to give accuracy to the lithographed illustrations of this work, which have been chiefly executed by Mr. John Collins, one of the most successful cultivators of his art in this country. Many of the plates have been drawn the second and third time; and in several instances the entire edition was cancelled, in order to correct inaccuracies that had previously escaped observation.

I have given much more space to the INTRODUCTION than was at first intended, in the hope of inviting, throughout this country, a greater interest to this important and attractive study. It is impossible to treat of such a subject, without drawing largely on the researches of those distinguished men who have devoted their time and talent to inquiries of this nature; among whom it is especially necessary to mention Buffon, Blumenbach, Humboldt, Prichard, Lawrence, Virey and Bory de St. Vincent; while, among the writers of this country, I have derived much instruction from the writings of the late Dr. Barton, Professor Caldwell, Dr. J. C. Warren, Professor Gibson, Dr. B. H. Coates and Dr. M'Culloh. The "Researches" of the last named gentleman, embody more facts relating to the Aborigines of America than almost any other work. To these and other sources of information, I have made specific acknowledgments throughout the following pages. The great work on Mexican Antiquities by Lord Kingsborough I have never seen; and Le Noir's splendid work on the same subject, and Mr. Delafield's American Antiquities, did not reach this city until my last sheets were already in press.

It will be observed, by comparing the prospectus issued three years ago with this work as now published, that I have greatly extended the original design by the addition of eighteen plates and nearly two hundred minor illustrations, together with a corresponding enlargement of the text. This object has been chiefly attained through the liberal and unsolicited patronage of two individuals

living at a remote distance from each other and from me, to whom I take this occasion to express my grateful acknowledgments. The first of these gentlemen is my venerable and much-honored uncle, James Morton, Esq., of Clonmel, Ireland; the other, my friend William Maclure, Esq., late of this city, and now resident in Mexico, well known as the distinguished President of the Academy of Natural Sciences of Philadelphia. I claim, however, some merit for having commenced publication when my subscription list bore but fifteen names; and I persisted for a long time on my own resources, although frequently apprehensive that an enterprise which never had gain for its object, would add pecuniary loss to numberless vexations.

I do not even now consider my task as wholly completed. On the contrary the illustrations of the Mexican nations are too few for satisfactory comparison owing to the extreme difficulty of obtaining authentic crania of those people. This deficiency, however, is likely to be soon obviated by the kindness of some friends of science in Mexico; and these materials, when received, together with some that came to hand too late for use, and many others that are expected, will enable me to complete my design by the publication of a small *Supplementary Volume;* in which it will further 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. I shall also take occasion to measure the anterior and posterior chambers of the skull in the four exotic races of men, in order to institute a comparison between them respectively, and between them and the American Race. But in order to accomplish this object, a very extended series of crania is of course indispensable; and the author therefore respectfully solicits the further aid of gentlemen interested in the cause of science, in procuring the *skulls of all nations*, and forwarding them to his address in this city. Nor can I close this preface without recording my sincere thanks to George R. Gliddon, Esq., United States Consul at Cairo, in Egypt, for the singular zeal with which he has promoted my wishes in this respect; the series of crania he has already obtained for my use, of many nations, both ancient and modern, is perhaps without a rival in any existing collection; and will enable me, when it reaches this country, to pursue my comparisons on an extended scale.

PHILADELPHIA, *October*, 1, 1839.

CRANIA AMERICANA.

INTRODUCTORY ESSAY

ON THE VARIETIES OF THE HUMAN SPECIES.

THE geographical distribution of the human race, is one of the most interesting problems in history. The oldest records seldom allude to an uninhabited country. The extremes of heat and cold, and the intervention of seas and mountains, have presented but trifling barriers to the peopling of the earth.

The condition of man, under these infinitely varied circumstances, is less the effect of coercion than of choice. Thus the Eskimau, surrounded by an atmosphere that freezes mercury, rejoices in his snowy deserts, and has pined in unhappiness when removed to more genial climes. On the other hand, the native of the torrid regions of Africa, oppressed by a vertical sun, and often delirious with thirst, thinks no part of the world so desirable and delightful as his own. The arid province of Chaco, in Paraguay, which the Spaniards stigmatise as a desert, is crowded by forty Indian nations, who regard it as an earthly paradise. It may be further remarked, in illustration of this subject, that extensive migrations have been mostly confined to the temperate zones: it is rare, for example, to find the Polar tribes wandering to the south, or the people of the torrid zones attempting to establish themselves in a colder climate. The exceptions to this rule are chiefly to be seen in the civilised communities of modern times, in which the spirit of migratory enterprise is without a limit.

From remote ages the inhabitants of every extended locality have been marked by certain physical and moral peculiarities, common among themselves, and serving to distinguish them from all other people. The Arabians are at this time precisely what they were in the days of the patriarchs: the Hindoos have

altered in nothing since they were described by the earliest writers; nor have three thousand years made any difference in the skin and hair of the Negro. In like manner the characteristic features of the Jews may be recognised in the sculpture of the temples of Luxor and Karnak, in Egypt, where they have been depicted for nearly thirty centuries.*

This identity of physical characteristics, preserved through numberless generations, and often under very dissimilar circumstances, has occasioned various speculations in respect to the origin of the human family. The prevalent belief is derived from the sacred writings, which, in their literal and obvious interpretation, teach us that all men have originated from a single pair;† whence it has been hastily and unnecessarily inferred, that the differences now observable in mankind are owing solely to vicissitudes of climate, locality, habits of life, and various collateral circumstances.

Without attempting to pursue this intricate question in detail, we may inquire, whether it is not more consistent with the known government of the universe to suppose, that the same Omnipotence that created man, would adapt

* See Description de l'Egypte, Tome II, pl. 6, and Tome III, pl. 40.

† "That the three sons of Noah overspread and peopled the whole earth, is so expressly stated in Scripture that, had we not to argue against those who unfortunately disbelieve such evidence, we might here stop: let us, however, inquire how far the truth of this declaration is substantiated by other considerations. Enough has been said to show that there is a curious, if not a remarkable analogy between the predictions of Noah on the future descendants of his three sons, and the actual state of those races which are generally supposed to have sprung from them. It may here be again remarked, that, to render the subject more clear, we have adopted the quinary arrangement of Professor Blumenbach; yet that Cuvier and other learned physiologists are of opinion that the *primary* varieties of the human form are more properly but *three*, viz: the Caucasian, Mongolian, and Ethiopian. This number corresponds with that of Noah's sons: assigning, therefore, the Mongolian race to Japheth, and the Ethiopian to Ham, the Caucasian, the noblest race, will belong to Shem, the third son of Noah, himself descended from Seth, the third son of Adam. That the *primary* distinctions of the human varieties are but *three*, has been further maintained by the erudite Prichard, who, while he rejects the nomenclature both of Blumenbach and Cuvier, as implying *absolute* divisions, arranges the leading varieties of the human skull under three sections, differing from those of Cuvier only by name. That the three sons of Noah who were to 'replenish the earth,' and on whose progeny very opposite destinies were pronounced, should give birth to different races, is what might reasonably be conjectured. But that the observations of those who *do*, and of those who do *not* believe the Mosaic history, should tend to confirm its truth, by pointing out in what these three races do actually differ, both physically and morally, is, to say the least, a singular coincidence. It amounts, in short, to presumptive evidence, that a mysterious and very beautiful analogy pervades throughout, and teaches us to look beyond natural causes, in attempting to account for effects apparently interwoven in the plans of Omnipotence."—MURRAY, *Encyc. of Geog.* p. 255.

him at once to the physical, as well as to the moral* circumstances in which he was to dwell upon the earth? It is indeed difficult to imagine that an all-wise Providence, after having by the Deluge destroyed all mankind excepting the family of Noah, should leave these to combat, and with seemingly uncertain and inadequate means, the various external causes that tended to oppose the great object of their dispersion: and we are left to the reasonable conclusion, that each Race was adapted from the beginning to its peculiar local destination. In other words, it is assumed, that the physical characteristics which distinguish the different Races, are independent of external causes.

Such appear to have been the primitive distinctions among men: but hostile invasions, the migratory habits of some tribes, and the casual dispersion of others into remote localities, have a constant tendency to confound these peculiarities; and the proximity of two races has uniformly given rise to an intermediate variety, partaking of the characters of both, without being identical with either: these are called *mixed races.*

The grouping of mankind into Races, has occupied the ingenuity of many of the best naturalists of the past and present century; and here again we observe that diversity of opinion which is so frequent in human researches. Linnæus referred all the human family to five races, viz: the American, the European, the Asiatic, and the African, and individuals of preternatural conformation. The Count de Buffon proposed six great divisions, viz: 1, The Hyperborean or Laplander, which embraces the Polar nations.—2, The Tartar, which includes the eastern and central nations of Asia.—3, The Southern Asiatic, which embraces the South Sea Islanders.—4, The European.—5, The Ethiopian.—And 6, The American. At a subsequent period Buffon reduced the races to five, by grouping the Laplanders with the Tartars, inasmuch as he regarded the one as a degenerate branch of the other.†

More recently Professor Blumenbach, of Gottingen, to whom this department of science is under great obligations, has adopted the arrangement of Buffon; changing the names, however, of some of the divisions, and assigning, with much greater accuracy, their geographical distribution. Thus, the Laplander and Tartar of Buffon constitute the Mongolian variety of Blumenbach; the Southern Asiatic of the one corresponds to the Malay of the other; and the European and Caucasian represent the same people in both arrangements.

The system of the celebrated Cuvier is still more elementary, for it proposes

* Genesis, IX, 25, 26, 27.

† Sonnini's Buffon, XX, p. 120, &c.

three races only: the Caucasian, Mongolian, and Ethiopian; but the author hesitates to refer to either of these, the Malays, the Papuas, the Australians, and the South Sea Islanders.*

At the other extreme is Malte-Brun, the distinguished geographer, who enumerates sixteen races, of which the American nations form but one.†

Much has also been written in reference to the *unity* of the human species: the affirmative opinion is sustained by Linnæus, Blumenbach, Cuvier, and many other distinguished naturalists; yet, on the contrary, Virey has divided mankind into two species, Dumoulin into eleven, and Bory into no less than fifteen.‡ Finally, a French professor, overstepping the barriers of reason and nature, has attempted to establish several subgenera.§

Such wide differences of opinion have led some persons to reject all classification in Anthropology; but the same objections would apply with equal force to the whole range of Natural Science, which, divested of arrangement, presents an uninviting chaos. As our means of comparing the races of men become more extended, our classification will of course improve; and meanwhile we must rest content with an approximation to accuracy. It may here be remarked, that two leading features constitute the basis of most of the attempted classifications of the human species: one of these is called the *physical*, the other the *ethnographic* method. In the former, mankind are grouped in great divisions characterised by similarity of exterior conformation; while on the last mentioned plan, the arrangement is based on analogies of language. Each of these systems has its advocates to the exclusion of the other; but it is reasonable to suppose that method most natural and comprehensive which is derived from both these sources, as well as from all others which tend to establish analogies among men. In order to combine, as far as possible, all these advantages, it is proposed in this place to consider the human species as consisting of *twenty-two families.*

It is necessary, however, to premise, that these families are not assumed as identical with races, but merely as groups of nations possessing, to a greater or less extent, similarity of physical and moral character, and language. Some of these families possess, it is true, the peculiarities of the aboriginal races to which

* Règne Anim. I, 84.

† See Bory de St. Vincent, T. I, p. 95.—I have not been able to find this classification in Malte-Brun, ed. 1832.

‡ Ibid. I, p. 83.

§ Broc, Essai sur les Races Humaines, 1836.

they belong; but others are of mixed and very diverse extraction, and of comparatively recent origin.

Believing, however, as I do, in the primitive distribution of mankind into races in the sense already explained, yet being unprepared to offer any thing new on the subject, I shall, for the present at least, adopt the arrangement of Professor Blumenbach as respects these great divisions:* for although his system is obviously imperfect, yet it is, perhaps, the most complete that has hitherto been attempted.

I. THE CAUCASIAN RACE.

The Caucasian Race is characterised 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. This race is distinguished for the facility with which it attains the highest intellectual endowments.

1. The Caucasian Family.
2. The Germanic Family.
3. The Celtic Family.
4. The Arabian Family.
5. The Libyan Family.
6. The Nilotic Family.
7. The Indostanic Family.

II. THE MONGOLIAN RACE.

This great division of the human species is characterised 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.

* It will be observed, however, that the word *race* is substituted for *variety*, and the order in which these divisions follow each other in Blumenbach is somewhat changed. *Vide* BLUMENBACH, *De Gen. Humani Var. Nat.* p. 289.

8. The Mongol-Tartar Family.
9. The Turkish Family.
10. The Chinese Family.
11. The Indo-Chinese Family.
12. The Polar Family.

III. THE MALAY RACE.

The Malay Race is characterised 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 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.

13. The Malay Family.
14. The Polynesian Family.

IV. THE AMERICAN RACE.

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.

15. The American Family.
16. The Toltecan Family.

V. THE ETHIOPIAN RACE.

Characterised by a black complexion, and black, woolly hair; the eyes are large and prominent, the nose broad and flat, the lips thick, and the mouth wide: the head is 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.

17. The Negro Family.
18. The Caffrarian Family.
19. The Hottentot Family.
20. The Oceanic-Negro Family.
21. The Australian Family.
22. The Alforian Family.

1. THE CAUCASIAN FAMILY.

This family, the type of the Caucasian Race, derives its name from the mountainous region of Caucasus, between the Black Sea and the Caspian, a spot to which history and tradition refer the primeval family of man. The spontaneous fertility of this tract has rendered it the hive of many nations, which extending their migrations in every direction, have peopled the finest portions of the earth, and given birth to its fairest inhabitants. On the present occasion we propose to notice the Caucasian family as consisting of three branches, the Caucasian proper, the Persian, and the Pelasgic.

1. The *Caucasians proper* are confined to the valleys and mountains of Caucasus. They are extremely numerous, and embrace many primitive tribes which differ in language, yet possess, in common, certain prominent physical characters. Independent of these aboriginal nations, it is said that five great immigrations of foreigners form as many epochs in the history of this country. These nations are the Lesghi, the Ghasazes, the Mongols, the Arabs, and the Tartars. The languages spoken are scarcely inferior in number to the remnants of nations. "There are villages perfectly insulated, each of which is a complete nation, whose language is not in the least comprehended by the people in the next village to them, and is spoken nowhere else."* Hence the observation of Major Rennel, that this remarkable tract, which forms an isthmus between the nations of the north and south, seems to have retained a specimen of each passing tribe from the date of the earliest migration.†

A few only of the most prominent of these nations will be noticed on the present occasion.

* Tooke's Russia, II, p. 107.

† Freygan, Caucasus, p. 51.

CRANIA AMERICANA.

THE ANCIENT PERUVIANS.

Peru is a narrow strip of land between the Andes and the sea, bounded on the south by a desert. Its fine climate, its productive soil, and its proximity to the ocean, render it one of the most interesting divisions of the southern continent; and its advantages appear to have been fully appreciated by the aborigines themselves, for there is evidence that several populous nations held successive dominion in the country.

History, even before the advent of the Spaniards, throws much light on one of these nations; that, for instance, which was governed by the Incas: yet, with respect to the others, we know little else than what can be gleaned from their monuments and cemeteries; and however meagre these facts may appear, they possess considerable interest, and the more so because so few others are available to us.

The arid region of Atacama* was the favorite sepulchre of the Peruvian nations for successive ages; for, while the climate tends rather to the desiccation than to the decay of the dead, the mixed sand and salt of the desert have contributed to the same end; and the lifeless bodies of whole generations of the former inhabitants of Peru may now be examined, like those from the Theban catacombs, after the lapse of hundreds, perhaps of thousands of years. The great number of the dead thus remaining in Peru, has been a subject of surprise to all travellers, and serves to convey an idea of the vast population that has at different

* The desert of Atacama divides the kingdom of Peru from that of Chilé, and is nearly an hundred leagues in length. "In the midst of it is the River of Salt, the water whereof is so brackish that it presently grows thick in the hand, or any vessel, and the banks are covered with salt."—Herrera, Dec. IV. Lib. IV. Cap. I.

periods derived its subsistence from that country. For example, we are told by an intelligent voyager, that having landed at Vermejo, in Peru, in the year 1687, he found the vicinity of that town so strewed with desiccated bodies, that, in his own language, a man might have walked a mile and a half, and trod on them at every step.* These circumstances long since made me desirous to obtain a series of crania from the Peruvian sepulchres, in order to ascertain, if possible, whether they present indications of more than one great family; or, in other words, to inquire whether among them I could trace such departures from the well known type of the American race, as would lead to the supposition that this continent was formerly inhabited by a plurality of races. In pursuing this inquiry I have been so fortunate as to have the examination, in my own and other collections, of nearly one hundred Peruvian crania: and the result is, that Peru appears to have 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 various 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 hitherto 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. The country around this inland sea was called Collao, and the site of what appears to have been their chief city, bears the name of Tiaguanaco.

Let us now glean from the few sources that are open to us, what can be discovered of the physical and intellectual character of these people, their history and tradition.

Our knowledge of their physical appearance is derived solely from their tombs. In stature they appear not to have been in any respect remarkable, nor to have differed from the cognate nations except in the conformation of the head, which is small, greatly elongated, narrow 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.

* Wafer, Voy. p. 165.

The first idea that occurs to every one on looking at a series of these skulls is, that their peculiarities are in a great measure artificial. If, however, we carefully examine the cranium figured on the fourth plate, together with the accompanying smaller outlines, we find no evidence of mechanical compression. This head, on the contrary, appears to be of the natural form, unaltered by art; and it is figured as an illustrative type of the cranial peculiarities of the people now under consideration.

It must almost invariably happen, that when the forehead of a naturally rounded head has been much compressed by art, the back and lateral parts of the cranium become proportionally expanded, in order to make room for the brain that has been displaced from the anterior chamber. Thus, among all the specimens I have seen of this deformity, from the tribes on the Columbia river, the ancient inhabitants of Venezuela, the Charibs of the Antilles and some tribes of Peruvians, I have met with no exceptions to the preceding rule. All these nations have, naturally, spheroidal heads, and the result of mechanical compression is such as above described; a point on which the reader can judge for himself by comparing the illustrations in various parts of this work. Now the heads of these ancient Peruvians seldom present such lateral expansion; but on the contrary are as remarkable for their narrowness as for their length. In fact their low facial angle, their sloping forehead, and their protruding face, might lead to a suspicion of a Negro origin, were it not for the unanswerable evidence derived from the texture of the hair. This is uniformly long and lank, and appears to have been worn at full length by both sexes, and its natural blackness is preserved notwithstanding centuries of inhumation. I am free to admit that the naturally elongated heads of these people were often rendered more so by the intervention of art, but such examples are for the most part readily detected. It is a feature both of civilised and savage communities to admire their own national characteristics above all others, and hence where nature has denied an imaginary grace, art is called in to supply the deficiency; and even where there has been no such deficiency, human vanity prompts to extravagance. Thus I have seen some skulls of this race which must have been naturally very low and long; yet in order to exaggerate a feature that was considered beautiful, compression has been applied until the whole head has assumed more the character of the monkey than the man. An example of this kind will be seen in the fifth plate, wherein the evidence of artificial flattening of the forehead is undeniable: but the congenital lowness of this region and great length of the head, have made very little compression necessary to effect the desired object; whence there has resulted but a trifling expansion of the posterior and lateral parts of the skull. On the other hand, had this cranium been of the

rounded form common to the American Indians, and especially to the existing Peruvians, it is difficult to imagine by what complex contrivances the present shape could have been produced.

It would 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; and it remains to show, that civilisation existed in Peru anterior to the advent of the Incas, and that those anciently civilised people constituted the identical nation whose extraordinary skulls are the subject of our present inquiry.

Among the first travellers in Peru, and perhaps the very first who recorded what he saw, was Pedro de Cieca, an officer in the army of Pizarro. Although an unlettered man, he describes with simplicity and clearness whatever came under his observation; and the following passage from his work, although of some length, is so interesting and so connected with the present inquiry, that I shall venture to give it entire.

"Tiaguanico," says he, "is not a very large town, but it is deserving of notice on account of the great edifices which are still to be seen in it; near the principal of these is an artificial hill raised on a groundwork of stone. Beyond this hill are two stone idols, resembling the human figure, and apparently formed by skilful artificers. They are of somewhat gigantic size, and appear clothed in long vestments differing from those now worn by the natives of these provinces; and their heads are also ornamented. Near these statues is an edifice which, on account of its antiquity and the absence of letters, leaves us in ignoranee of the people who constructed it: and such indeed has been the lapse of time since its erection, that little remains but a well built wall, which must have been there for ages, for the stones are very much worn and crumbled. In this place, also, there are stones so large and so overgrown that our wonder is excited to comprehend how the power of man could have placed them where we see them. Many of these stones are variously wrought, and some having the form of men, must have been their idols. Near the wall are many caves and excavations under the earth; but in another place more to the west are other and greater monuments, consisting of large gateways and their hinges, platforms and porches, each of a single stone.

"What most surprised me while engaged in examining and recording these things, was that the above enormous gateways were formed on other great masses of stone, some of which were thirty feet long, fifteen feet wide, and six feet thick. Nor can I conceive with what tools or instruments these stones were hewn out; for it is obvious that before they were wrought and brought to perfection, they

must have been vastly larger than we now see them. Before I proceed to a further account of Tiaguanico, I must remark that this monument is the most ancient in Peru: for it is supposed that some of these structures *were built long before the dominion of the Incas*, and I have heard the Indians affirm that these sovereigns constructed their great buildings in Cuzco after the plan of the walls of Tiaguanico, and they add that the first Incas were accustomed to hold their court in this place. Another very curious fact is, that in the greater part of this territory there are no quarries nor rocks whence the materials for these structures could have been derived. I asked the natives, in the presence of Juan de Varagas, (who commands here,) if these edifices were built in the time of the Incas? But they laughed at the question, repeating what I have already stated, adding that they did not know who built them, but that they had a tradition of their ancestors that these structures appeared in a single night as we now see them."*

These statements, and many others to the same purpose, are confirmed by the Vicar-general, Diego de Alcobaza, who also visited Tiaguanico, and has left an account of the architectural wonders he saw there.†

It will be observed by the preceding narrative, that tradition among the Peruvians attributed these cyclopean structures to an era long antecedent to the appearance of the Incas, and this tradition is sustained by history; for the city of Tiaguanico did not fall into the hands of the Incas until the reign of Mayta Yupanque, the fourth king, at which period the edifices in question must have been in existence for centuries, and were already in a state of ruin and decay. Garcilaso de la Vega, himself of the royal Peruvian family, admits that these ruins existed at the time the country was conquered by his ancestors;‡ and a Peruvian author, two centuries and a half nearer our own time, states that Tiaguanico is indisputably anterior to the monarchy of the Incas, and speaks, as if from personal observation, of a gigantic pyramid and colossal human figures cut from solid rock, indicative of the power and genius of a great nation.§ The first invasion of the Incas was followed by the erection of some temples to enforce the new religion, but their only great architectural monument in these parts, the Temple of the Sun on the island in Titicaca, was not built until the reign of Tapac Yupanque, the tenth Inca, early in the fifteenth century. Herrera also alludes to a tradition

* Pedro de Cieca, Chronica del Peru, Cap. 105. 18mo. Anvers, 1554.—See also Acosta, Hist. de las Indias, Lib. VI, Cap. XIV.

† Garcilaso de la Vega, Commentarios, Lib. III, Cap. 1.

‡ Idem. Loco citato.

§ Mercurio Peruano, Lima, 1791.

of the Indians that these edifices had been built by Amazons at a remote era, nor are the Incas mentioned as having had any part in their construction.*

"It is probable," says Humboldt, "that the edifices which are called in Peru by the name of *Inga-pilca*, or Buildings of the Inca, do not date further back than the thirteenth century. Those at Vinaque and Tiaguanico were constructed at a more remote period: so also were the walls of unbaked brick, which were made by the ancient inhabitants of Quito. It is to be desired that some intelligent traveller would visit the banks of the great lake Titicaca, the province of Collao, and more especially the elevated plain of Tiaguanico, which is the centre of an ancient civilisation in this region."†

It will now be asked what evidence can be adduced to prove that the people, whose remains we are considering, were the same with those who have left the architectural monuments of Tiaguanico and Titicaca? The fact is established by the observations of Mr. Pentland, an intelligent English traveller, who has recently visited the upper provinces of Peru. This gentleman states that in the vicinity of Titicaca he has "discovered innumerable tombs, hundreds of which he entered and examined. These monuments are of a grand species of design and architecture, resembling Cyclopean remains, and not unworthy of the arts of ancient Greece or Rome. They therefore betokened a high condition of civilisation; but the most extraordinary fact belonging to them is their invariably containing the mortal remains of a race of men, of all ages, from the earliest infancy to maturity and old age, the formation of whose crania seems to prove that they are an extinct race of natives who inhabited upper Peru above a thousand years ago, and differing from any mortals now inhabiting our globe. The site is between the fourteenth and nineteenth degrees of south latitude, and the skulls found (of which specimens are both in London and Paris) are remarkable for their extreme extent behind the occipital foramen; for two-thirds of the weight of the cerebral mass must have been deposited in this wonderfully elongated posterior chamber: and as the bones of the face were also much elongated, the general appearance must have been rather that of some of the ape family than of human beings. In the tombs, as in those of Egypt, parcels of grain were left beside the dead; and it was another

* Hist. Dec. III, Lib. IX, Cap. 1.

† Monuments, I, p. 5.—See also Dr. M'Culloh, (Researches, p. 406,) who remarks, in confirmation, "that a certain degree of demi-civilisation prevailed in the nations adjoining the Peruvian empire, which was not derived from their communication with the latter."

singular circumstance that the maize, or Indian corn, so left, was different from any that now existed in the country."

Mr. Pentland expresses his decided opinion "that the extraordinary forms thus brought to the light of day after their long sojourn, could not be attributed to pressure, or any external force, similar to that still employed by many American tribes; and adduced, in confirmation of this view, the opinions of Cuvier, of Gall, and of many other naturalists and anatomists. On these grounds he was of opinion that they constituted the population of these elevated regions before the arrival of the present Indian population, which in its physical characters, customs, &c., offers many analogies with the Asiatic population of the old world."*

The preceding facts appear to establish two important propositions; first, that the primitive Peruvians had attained to a considerable degree of civilisation and refinement, so far at least as architecture and sculpture may be adduced in evidence, long before the Incas appeared in their country; and secondly, that these primitive Peruvians were the same people whose elongated and seemingly brutalised crania now arrest our attention; and it remains to inquire, whether these are the same people whom the Incas found in possession of Peru, or whether their nation and power were already extinct at that epoch?

The modern Peruvian empire had existed upwards of four hundred years at the time of the Spanish conquest, so that its origin may be dated somewhere about the year 1100 of our era. Now it appears that among the first military enterprises of this new family was the conquest of Collao, which possessed a productive soil and a warlike population, and embraced within its confines the Lake Titicaca, from which the Incas pretended to have derived a supernatural origin. Every effort was therefore made to subdue and to destroy the Collas. The Inca Yupanque waged against them a war of extermination; and we are told by Herrera that in some of the towns he left so few persons alive, that inhabitants were afterwards sent from other parts of Peru to colonise the wasted districts.† The same historian adds, that in order further to depopulate the country, the inhabitants were banished from it in large bodies, and dispersed through other provinces of the empire; and yet such was the dread in which the new dynasty held these warlike people, that they forbade more than a thousand of them to

* Report of the Fourth Meeting of the British Association for the Advancement of Science, p. 624; and Additional Reports, which were republished in Waldie's Journal of Belles-Lettres, 1834.

† Historia de las Indias, Dec. III, Lib. IX, c. 4.

be within the walls of Cuzco at a time, lest they should attempt some revolutionary enterprise. It therefore appears that no means were left untried to subdue and exterminate the people of Colla;* yet how far such a system, persisted in at intervals for more than two centuries, could have annihilated a whole nation, I shall not attempt to decide.

When the Spaniards took possession of these provinces, they found them inhabited by barbarous tribes, and the islands in the lake Titicaca, which had once been highly cultivated, were then waste and vacant. Upon the lake were seen rafts made of the reed called by the natives *totora*, and on these rafts whole families made their home, tossed here and there upon the waters by every change of wind. They were in so brutalised a state that when asked to what nation of people they belonged, they replied, "We are not men, but Uros," as if they did not consider themselves as belonging to the human species.† Were these Uros (for so they named their tribe) the remains of the savage colonies sent from other parts of Peru to supplant the Collas? This inference bears at least the stamp of probability, but it still does not aid us in ascertaining whether the Collas themselves were the remains of the primitive civilised Peruvians.‡

It may be added, that Garcilaso describes the Peruvian tribes near the sea coasts, to whom he applies the collective name of Yuncas, as living in the utmost barbarism at the advent of the Incas. In proof of this statement he adduces their mythology, which accorded divine attributes to every thing in which they observed any dominant excellence. Thus, says he, they worshipped the fox for his cunning, the deer for his swiftness, and the eagle for the perfection of his sight. These superstitions, however, are not more surprising than those of the primitive ages of civilisation in the old world; and there appears throughout the Spanish historian an evident disposition to depreciate the character of the ancient tribes of Peru, in order to palliate the cruel measures which were resorted to by the Incas for their subjugation. Garcilaso himself describes a remarkable temple at Pachacamac, which was erected by the Yuncas; and the Chimuyans, who were something farther to the south, appear to have possessed extensive and regular edifices, together with some other attributes of civilisation. The inhabitants of Chimù resisted the Incas with great valor, and appear to have been very superior to most

* Garcilaso de la Vega, Comment. Lib. III, cap. 3.

† Acosta, Hist. de las Indias, Lib. III, cap. 6.—De Laet, Novus Orbis, Lib. XI.

‡ Indian tradition relates that the Collas were *all* destroyed at once, but attributes this catastrophe to an inundation. See Herrera, Dec. III, Lib. IX, c. 1.

of the adjacent tribes at that early epoch. Nevertheless, they could not compare with the primitive nation of Collao; and when we find the remains of the latter mingled, as it were, among those of the barbarous hordes on the sea coast, their presence may be accounted for in the casualties of war or commerce, or by that forced system of colonisation to which we have already alluded.

I have followed up the researches of Baron Humboldt and Dr. M'Culloh with the more zeal, because so little notice has been taken of the subject by other writers; and especially because we are now able to take one step more in the inquiry, by studying the arts of these people in connection with their cranial remains.*

* Mr. Stevenson has described some very interesting ruins near the village of Langunilla in the province of Caxamarca, which he supposes to be anterior to the Inca dominion in Peru. He represents these remains to be those of a town, of which the houses are all built of stone, surrounding a rock or hill in a valley. "The bottom tier or range of rooms has walls of an amazing thickness, in which I have measured stones twelve feet long and seven feet high, forming the whole side of a room, with one or more large stones laid across, which serve as a roof. Above these houses another tier was built in the same manner, on the back of which are the entrances or doorways, and a second row had their backs to the mountain. The roofs of the second tier in front had been covered with stone, and probably formed a promenade; a second tier of rooms thus rested on the roofs of the first tier, which were on a level with the second front tier. In this manner one double tier of dwelling rooms was built above another to the height of seven tiers." The author adds that this series of buildings was capable of containing five thousand families, and he gives his reasons for supposing it to be, not a granary of the Incas, as some travellers have imagined, but the residence of the lord of Chicama, "when he resided in the interior of his territory before it became subject to the Inca Pachacutec." These ruins present no remains of delicate sculpture, although some of the stones are carved in arabesques. Similar to these are the remains of the fortified palace of Paramonga. *Trav. in S. Amer.* II, p. 22, 170, 173.

PLATE I.

EMBALMED HEAD, FROM THE PERUVIAN CEMETERY AT ARICA.

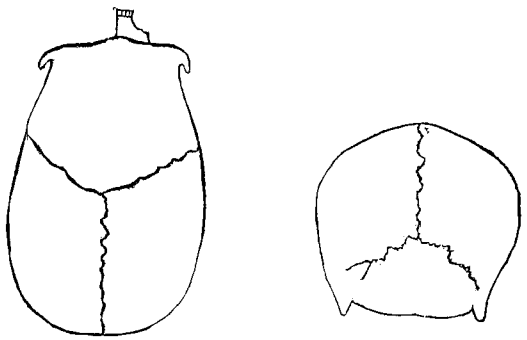
This head, though obviously a relic of antiquity, has not all the characters of the Ancient Peruvian, nor is it introduced as an unequivocal example of that race. The forehead is extremely retreating, and at least partially moulded by artificial means; but the whole cranium is broader, both in its frontal and parietal diameters, than is usual in the people now under consideration. It is carefully and effectually embalmed: the flesh of the neck and face has been removed and its place supplied by Lama wool, and the whole head appears to have subsequently undergone the process of tanning and drying. The skin is almost black, the sockets filled, the external appendages of the eye admirably preserved, and the hair, which is long, is elaborately plaited, and disposed with great apparent care. The sharpness of the superciliary ridges indicates the effect of a board or bandage, which has compressed the os frontis and widened the whole head. This is the most perfect instance of embalming, among the American nations, that has come under my notice. The head was found separate from the body, and enveloped in a sack of corresponding size, made of coarse thread or twine. It was disinterred in the vicinity of Arica, and politely lent me for insertion among the illustrations of this work, by Mr. James Blake, of Boston, Massachusetts.

The inhabitants of Port Mulgrave, on the northwest coast, and some other tribes, decapitate their dead chiefs, and place the head in a box by itself;* from which and other circumstances it is probable that the present relic was not that of an enemy, but a person of distinction.

* Dixon, Voy. p. 176, 181.—This singular custom also prevails in some of the South Sea Islands, as the Ladrone and Society Islands, and the Gambier Group.—Hawksworth, Voy. II, p. 236.—Beechey, Voy. I. p. 121.

PLATE II.

ANCIENT PERUVIAN.



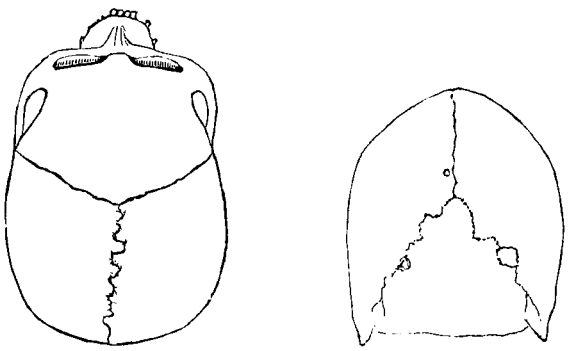
This extraordinary relic was exhumed from that part of the sandy tract of Atacama which is nearest to Arica. I received it in fragments from Mr. T. R. Peale of this city, and have been so fortunate as to recompose all the parts. The observer is struck with the greatly inclined forehead, the extreme elongation of the whole head, and more particularly by the length of the occiput behind the ear; yet there is but little lateral expansion of the head, which, with the face, is narrow in proportion throughout.

This cranium belongs to a child not more than five years of age, and presents the following measurements.

Longitudinal diameter, ...	6.9 inches.
Parietal diameter, ...	4.6 inches.
Frontal diameter, ...	3.7 inches.
Vertical diameter, ...	4.3 inches.
Extreme length of head and face, . . .	7.5 inches.
Internal capacity, ...	64. cubic inches.
Capacity of the anterior chamber, . . .	17. cubic inches.
Capacity of the posterior chamber, . . .	47. cubic inches.

PLATE III.

ANCIENT PERUVIAN.



A skull with a singularly flat and retreating forehead, and projecting face. The narrowness of the head, however, is not remarkable, and very slight pressure, if any, has been applied to the frontal bone. The latter presents a rounded ridge extending from the nasal bones backwards to the sagittal suture, which elevation would probably have been obliterated if much compression had been resorted to. On the other hand, a friend has suggested that this ridge may be the result of compression itself, from ligatures which have pressed up the bones proximate to the frontal suture of infancy; yet such a result could hardly have followed unless the compression was ingeniously withheld from that part of the forehead. Again, on plates XVII and LV of this work, two skulls are figured in which this frontal ridge is as strongly developed as in any others in my possession, and yet are obviously devoid of mechanical agency. Of the few skulls of ancient Peruvians that have come under my notice, the larger number possesses this ridge in a striking degree, and it is least obvious in those instances where the flattening process is most evident, for example in plate V.

MEASUREMENTS.

Longitudinal diameter, ...	6.5 inches.
Parietal diameter, ...	5.2 inches.
Vertical diameter, ...	5.1 inches.
Frontal diameter, ...	4.3 inches.
Extreme length of head and face, . . .	8.3 inches.
Inter-mastoid arch, ...	14.5 inches.
Inter-mastoid line, ...	4. inches.

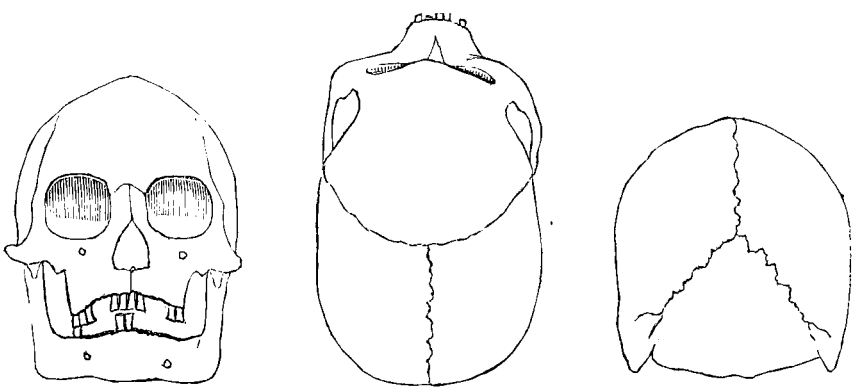
Occipito-frontal arch,	13.8	inches.
Horizontal periphery,	18.5	inches.
Internal capacity,	72.5	cubic inches.
Capacity of the anterior chamber,	26.	cubic inches.
Capacity of the posterior chamber,	46.5	cubic inches.
Capacity of the coronal region,	14.75	cubic inches.
Facial angle,.	68	degrees.

This skull belongs to the Philadelphia Museum, and was lent me by Mr. T. R. Peale. The entire desiccated body was obtained from the borders of the desert of Atacama, not far from Arica. The remains were those of a woman who may have reached her thirtieth year. The hair was very long, and had lost none of its natural black color. With the body was found a small bag, not unlike a modern reticule, in which were contained some copper fish-hooks and small instruments of bone which were probably used in forming the meshes of their nets or other fabrics. Among the envelopes were also observed small pieces of an aromatic gum.

Through the kindness of Alexander Naysmith, Esq., of London, I possess casts of the six skulls brought by Mr. Pentland from the vicinity of the lake Titicaca, and five of them are strikingly like the specimen here figured, both as respects their general form, their narrow face, their small size, and their several diameters; yet they present more obvious marks of artificial modification.

PLATE IV.

ANCIENT PERUVIAN.



I have already alluded to this relic as furnishing an example of the head of the primitive Peruvians unaltered by art; and it may therefore stand as a type of

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

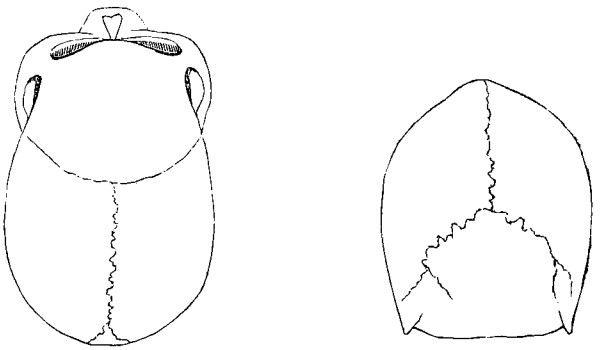
My friend Dr. Ruschenberger, from whom I received this skull, has preserved the following memorandum of the circumstances under which it was found.

"About a mile from the town, (Arica,) on the south side of the *morro*, is a cemetery of the ancient Peruvians. There is one path to it over the hill, which is somewhat laborious, and another round the base of Arica Head, which is only practicable when the tide is low. On one side of the hill are found the graves of this injured people, indicated by hillocks of upturned sand, and the numbers of human bones bleaching in the sun, and portions of bodies, as legs and arms, or a hand and foot, scattered over the surface. 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. Immediately beneath are found the bodies, in graves or holes, not more than three feet in depth. 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 of the head. The whole was

enveloped in a coarse but close fabric, with stripes of red, which has withstood wonderfully the destroying effects of ages, for these interments were made before the conquest, though at what period is not known."*

PLATE V.

ANCIENT PERUVIAN.



I have not ascertained from what particular part of Peru this skull was obtained, but it is strikingly analogous to the three preceding specimens. The intervention of art in flattening the skull is very manifest, yet it has been effected on a forehead extremely low by nature; for the lateral swell is not remarkable, and the parietal protuberances, in particular, are not much more inflated than was natural to these people. The depth of the cranium behind the coronal suture is remarkable; and the very narrow face in this instance proves that the head could not have been originally spheroidal, like that of the later inhabitants of Peru.

This specimen was politely lent me by Dr. J. Kearney Rodgers, of New York, of whose collection it forms a part.

MEASUREMENTS.

Longitudinal diameter, ...	6.7 inches.
Parietal diameter, ...	4.5 inches.
Frontal diameter, ...	4.1 inches.
Vertical diameter, ...	4.1 inches.
Inter-mastoid arch, ...	11.5 inches.
Inter-mastoid line, ...	3.6 inches.
Occipito-frontal arch, ...	14.2 inches.

* Three Years in the Pacific, p. 341.

Horizontal periphery,	18.	inches.
Extreme length of head and face,	8.8	inches.
Internal capacity,	65.5	cubic inches.
Capacity of the anterior chamber,	19.75	cubic inches.
Capacity of the posterior chamber,	45.75	cubic inches.
Capacity of the coronal region,	12.75	cubic inches.
Facial angle,	61	degrees.

It will be shown in the sequel that the average internal capacity of the Caucasian or European head is at least ninety cubic inches; and it will be observed that the three adult skulls in the preceding series of ancient Peruvians, give an aggregate of two hundred and nineteen cubic inches, or a mean of seventy-three. It will also be observed, that the mean capacity of the anterior is about one half of that of the posterior chamber, or twenty-five to forty-seven; while the mean of the facial angle is but sixty-seven degrees.

THE CHIMUYANS.

This name, Chimù, was applied rather to a chief than a territory. The province of the "Great Chimù" was very near the present site of Truxillo, in Peru, and its inhabitants had attained a certain degree of civilisation before they were conquered by the tenth Inca. My friend Dr. M. Burrough, (now United States Consul at Vera Cruz,) examined the ruins of the Chimuyan city with great care, and traced the remains of dwellings, walls and terraces, over an extensive plot of ground.*

* For some additional particulars respecting the remains of the ancient demi-civilisation in South America, the reader is referred to the learned *Researches* of Dr. M'Culloh, Chap IX.

The great and uniform differences between these heads and those of the American Indians, will be obvious to every one accustomed to make comparisons of this kind, and serve as corroborative evidence of the opinion that the Eskimaux are the only people possessing Asiatic characteristics on the American continent.

ANATOMICAL MEASUREMENTS.

These measurements are derived from one hundred and forty-seven skulls of American Indians of forty different nations and tribes; and the crania are all of adult persons, and unaltered by art. The table is itself sufficiently explanatory for general purposes, but it is necessary to premise the manner in which the measurements have been taken.

The *longitudinal diameter* is measured from the most prominent part of the os frontis, between the superciliary ridges, to the extreme end of the occiput.

The *parietal diameter* is measured between the most distant points of the parietal bones, which are, for the most part, the protuberances of these bones.

The *frontal diameter* is taken between the anterior inferior angles of the parietal bones.

The *vertical diameter* is measured 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 table 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.

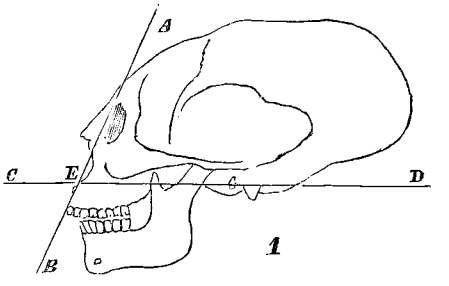
The *horizontal periphery* is measured by passing a tape around the cranium so as to touch the os frontis immediately above the superciliary ridges, and the most prominent part of the occipital bone.

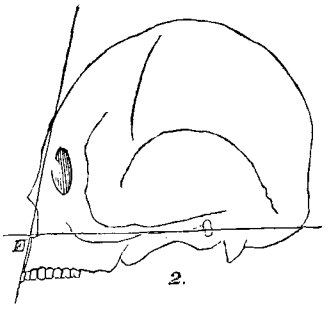
The *length of the head and face* is measured from the margin of the upper jaw, to the most distant point of the occiput.

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

* The facial angle, which was first proposed by the learned Professor Camper, is measured in the following manner: a line called the facial line, is drawn from the anterior edge of the upper jaw, (or, if the tooth projects beyond the jaw, from the tooth itself,) to the most prominent part of the forehead, which is usually the space between the superciliary ridges. A second or horizontal line, is drawn through the external opening of the ear (meatus auditorius) till it touches the base of the nostrils, between the terminal roots of the front incisor teeth, and from this point it is still prolonged until it meets with the facial line already described: hence the two lines may meet at, or very near, the nasal spine, or base of the nose; but in other instances the decussation of the lines occurs at a point considerably anterior to the bone. It is obvious that an angle will be formed where these lines thus intersect each other, and this is the facial angle. For example, notice the annexed wood cut, (No. 1,) which represents the skull of the Cowalitsk already figured in this work, (see Plate 50.) The line A, B, is the facial line, extending, as just observed, from the anterior margin of the upper jaw to the most prominent part of the os frontis; the second or horizontal line, is represented between the points C and D, and for the purpose of having a fixed point for its anterior termination, I have uniformly carried it to the *nasal spine*, above and between the roots of the two front incisor teeth. The point E, where these lines decussate each other, is the facial angle, which in the present instance will be found to measure about sixty-six degrees.—The second wood cut (No. 2) represents the lines as drawn on a much better formed head, that of a Peruvian Indian, in which the angle at E measures seventy-six degrees.





The most casual inspection of these diagrams will satisfy any one that the facial angle is no criterion of mental intelligence; and in justice to Camper we must add that he does not assert it to be so. In fact it chiefly gives the projection of the face in relation to the head, without conveying the least idea of the capacity of the cranium, which is often the same in heads whose diameters are altogether different. The mere obliquity of the teeth contracts the angle; and what is yet more important, the space between the eyes from whence the facial line is drawn, may be very prominent, so as to give an angle of eighty degrees, while the forehead itself retreats so rapidly, that if the facial line were made to touch it, the resulting angle would not perhaps exceed sixty-five degrees.

"The maximum angle that can be embraced by the facial lines," says Camper, "is 100°: if we advance these lines still further, the head becomes preternaturally large, as in hydrocephalus. But it is surprising to observe that the most ancient Greek artists have chosen the very maximum of the facial angle, while the best Roman graveurs were satisfied with the angle of 95°.

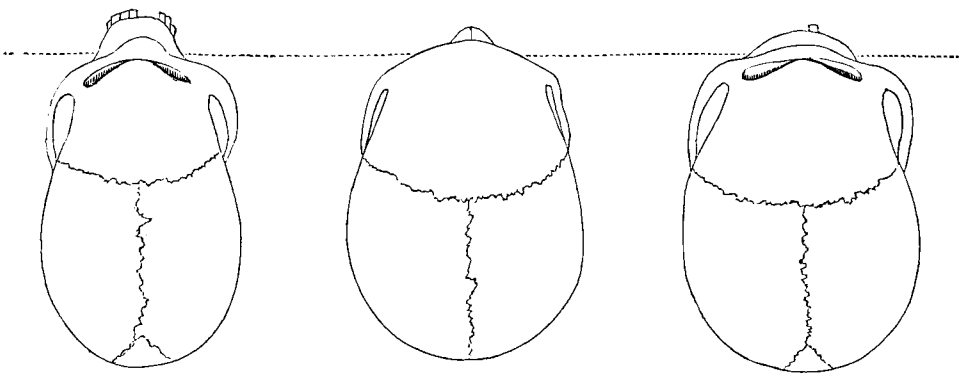
"I have thus established the two extremes of obliquity in the facial line, viz: from 70° to 100°.

and ready application, which has received so many additions from the suggestions of different individuals, that its invention cannot be ascribed to any one person. The original idea, however, originated with my friend Dr. Turnpenny; and I have much pleasure in explaining it, inasmuch as it appears to me to supersede

These embrace all the gradations, from the head of the Negro to the sublime beauty of the ancient Greek models. If we descend below 70° we have an orang outang, or a monkey; if we descend still lower we have a dog or a bird—a snipe, for example, of which the facial line is almost parallel with a horizontal plane."—(*Dissertation sur les différence rèelles, &c.*, p. 42, &c.)

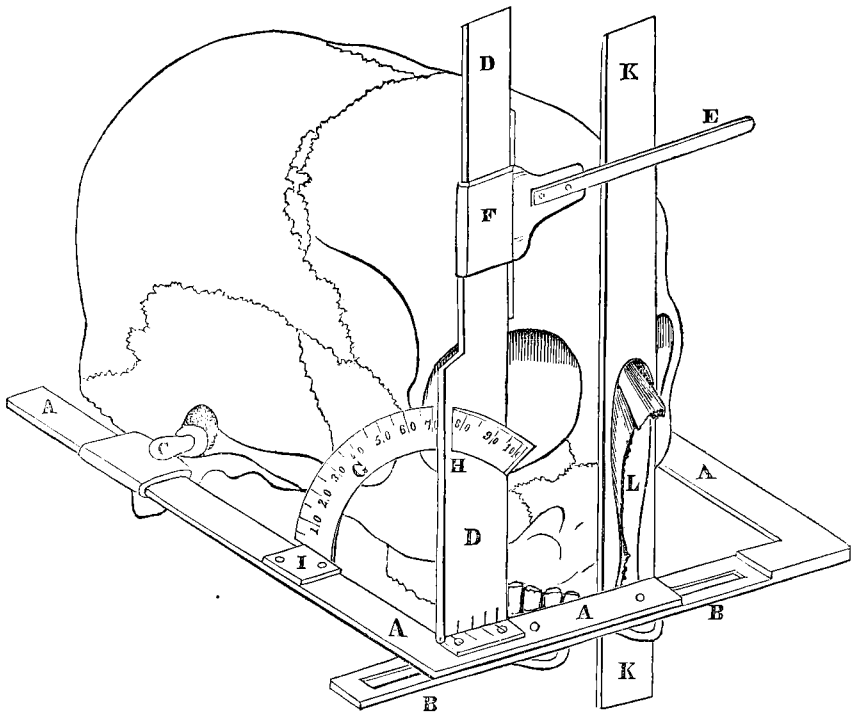
Professor Blumenbach has denied that the genuine antique heads present an angle of 95° or 100°, and supposes that such measurements could only be derived from incorrect copies. Dr. Wiseman, on the other hand, remarks, "that whoever will examine the heads of Jupiter in the Vatican Museum, particularly the bust in the large circular hall, or the more defaced heads of the Elgin marbles, will be satisfied that Camper is accurate in this respect."—(*Twelve Lectures, &c.*, p. 105.)

Another mode of comparing skulls was devised by Professor Blumenbach, called the *norma verticalis*, or vertical method; and consists in supporting the head on the lower jaw, and then looking down upon it from above and behind. If, however, several skulls are to be compared, they are to be stood each one on its occiput, the jaw being vertical and resting against a board or other plane surface. To make the comparison complete, the occipital ends should be so elevated as to bring the cheek bones on a line, as in the following diagram, which is copied from Blumenbach.—(*De Generis Humani Var. Nat.* p. 204, *et tab.* 1.)



The *first* of these figures represents a Negro head, elongated, and narrow in front, with expanded zygomatic arches, projecting cheek bones, and protruded upper jaw. The *second* is a Caucasian skull, in which those parts are nearly concealed in the more symmetrical outline of the whole head, and especially by the full development of the frontal region. The *third* figure is taken from a Mongol head, in which the orbits and cheek bones are exposed, as in the Negro, and the zygomæ arched and expanded; but the forehead is much broader, the face more retracted, and the whole cranium larger. Having been at much pains to give the *norma verticalis* of the skulls figured in this work, the reader will have ample opportunity to compare for himself. He will see that the American head approaches nearest to the Mongol, yet is not so long, is narrower in front, with a more prominent face and much more contracted zygomæ.

all other modes of ascertaining the facial angle. The following diagram represents the instrument, which may be called the *Facial Goniometer*, as applied to a cranium for the purpose of measurement.



The letters A, A, A represent the rectangular basal limbs of the instrument, (which is made of brass,) the front limb sliding at B, so as to increase or diminish the distance between the right and left limbs. In order to fix the goniometer to a skull, there is attached to each of the lateral limbs a slide with a conical pivot attached, C, which enters the meatus of the ear. The limb D, D, is attached by a hinge to the base, and can be brought to form any angle with it. G is a scale of one hundred degrees, attached by a hinge at I, and let through the limb D, D, at H. E is a horizontal limb, at right angles with D, D, on which it slides at F. The thin piece of wood, K, K, has an opening at L, to admit the nasal bones to pass through it. Now this piece of wood necessarily touches the most prominent parts of the forehead and upper maxillary bone, and therefore represents the *facial line*. To measure the facial angle, bring the upper surface of the anterior basal limb of the instrument on a horizontal plane with the nasal spine; then let the limb D, D, fall back until the lateral limb E, touches the facial line K, K, when the facial angle will be at once designated on the scale. For the purpose of greater accuracy the lateral basal limbs of the instrument are graduated in inches and parts of inches,

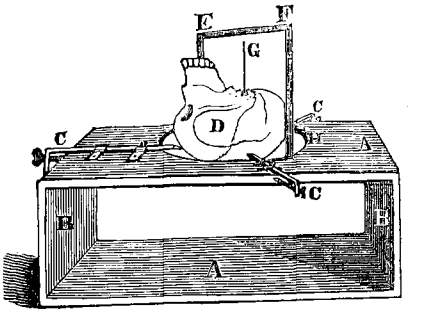
(not represented in the diagram,) and the sliding parts of the anterior limb are fixed by screws (as seen on each side of A) whenever the instrument is properly adjusted. With this apparatus the facial angle of any skull may be ascertained with exactness in the brief space of two or three minutes.

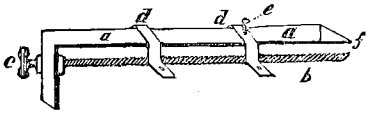
Internal capacity.—An ingenious mode of taking this measurement was devised by Mr. Phillips, viz: a tin cylinder was provided about two inches and three-fourths in diameter, and two feet two inches high, standing on a foot, and banded with swelled hoops about two inches apart, and firmly soldered, to prevent accidental flattening.—A glass tube hermetically sealed at one end, was cut off so as to hold exactly five cubic inches of water by weight, at 60° Fahrenheit. A float of light wood, well varnished, two and a quarter inches in diameter, with a slender rod of the same material fixed in its centre, was dropped into the tin cylinder; then five cubic inches of water, measured in the glass tube, were poured into the cylinder, and the point at which the rod on the float stood above the top of the cylinder, was marked with the edge of a file laid across its top; and the successive graduations on the float-rod, indicating five cubic inches each, were obtained by pouring five cubic inches from the glass tube *gradatim*, and marking each rise on the float-rod. The graduations thus ascertained, were transferred to a mahogany rod fitted with a flat foot, and these subdivided, with compasses for the cubic inches and parts. 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 the tin cylinder, which was well shaken in order to pack the seed. The mahogany rod 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.

Nearly all the preceding measurements were taken with my own hands.

Coronal, sub-coronal, anterior and posterior chambers of the cranium.—An apparatus was devised by my friend Mr. Phillips to obtain these capacities, which

* 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.





will be best understood with the aid of the annexed diagram. A, A, represent the top and bottom, and B, B, the ends of the instrument, dovetailed into each other to prevent warping. C, C, C, are sliders and screws, the latter being fitted with collars on each side of the sliders where they pass through it, in order that the screw may carry the slider along with it when moved backward and forward. D, cranium to be measured. E, F, is an iron straight-edge, standing on two legs welded to it and filed to the same length, so that when they rest on a horizontal plane, the straight-edge is also horizontal. G is a rod attached to a float of cork, small enough to drop into the foramen magnum; it is cut to such a length that when the base of the float is raised to the level of the plane on which rest the legs of the straight-edge E, F, the top of the rod shall rise to the upper margin of the straight-edge. H is an oval hole cut in the top of the frame A, (which is of stout mahogany plank,) large enough to admit the free adjustment of the largest cranium. *In the lower figure*, *c*, is the screw moving the slider *a*, *a*, the former, when in place, working into a nut through a hole in the mahogany top-piece. *d*, *d*, are clamps to confine the slide in a regular direction: *f*, the point of the slider as shown in the lower figure, is bevilled off on the top and two sides; but the lower side of the slider is carried out straight to the point, which is thus kept in the same plane as the top of the frame on which it is bound by the pinching-screw *e*, tapped into the clamp nearest the point of the slider.

Capacity of the coronal region.—This measurement is the space included between an imaginary plane drawn through the centres of ossification of the parietal and frontal bones, and the inner surface of the portion of cranium above it. To obtain this measurement, the instrument was first adjusted so as to bring the top of the frame A, A, to coincide with the plane of the horizon. The sutures and small foramina on the top of the skull being stopped with wax or putty, and when necessary, the inside of the cranium having been well varnished, the centres of ossification of the parietal bones were marked with a cross, and a line was drawn between the centres of ossification of the os frontis: the cranium was then placed inverted in the oval hole H, and the point of the slider at the end of the frame being pressed against the drawn line between the centres of ossification of the

frontal bone, the sliders at the sides of the instrument are then brought in contact with the centres of ossification of the parietal bones, the slider at the end being moved backward or forward to bring the cranium into the proper place. The float C is then dropped into the foramen magnum, and the frame E, F, held over it, as shown in the figure: mercury is then poured into the cranium until the top of the float-rod rises to the straight-edge E, F, thus indicating the surface of the mercury to stand at the level of the top surface of the frame A, A; and as the adjustment of the centres of ossification to the points of the sliders has brought them into the same plane as the top of the frame, the surface of the mercury must coincide with an imaginary plane, drawn through the centres of ossification. The mercury is then transferred to a graduated glass tube, and the capacity of the coronal region read off in cubic inches and parts.

The *sub-coronal region* is obtained by deducting the capacity of the coronal region (obtained as above stated) from the total capacity.

Capacity of the anterior chamber of the cranium.—This measurement is the capacity of the space contained between an imaginary plane, at right angles to the anterior and posterior diameter of the cranium, coinciding with, or let fall from the anterior margin of the foramen magnum, and passing at right angles through the imaginary plane (drawn through the centre of ossification) which formed the dividing line between the coronal and sub-coronal regions. It is thus taken: the cranium being placed in the frame exactly as in taking the capacity of the coronal region, the straight-edge of a slip of wood is laid across it over the anterior margin of the foramen magnum and at right angles to the anterior and posterior diameter of the skull. One side of a carpenter's square is then laid on the mahogany surface, so that the other side of the square, which would then be upright, would stand with its flat surface pressing against the side of the cranium; and another square is adjusted in the same manner on the other side of the skull, each having one of their vertical edges pressing against the straight edge of the ruler laid over the anterior margin of the foramen magnum; and a pencil mark is drawn on each parietal bone along the perpendicular edges of the squares adjusted to the straight edge; these pencil marks will be at right angles to the plane passing through the centres of ossification, and indicate the position of the plane dividing the anterior and posterior chambers, as described in the definition of that capacity. The cranium is then taken from the instrument, and a hole, eighth of an inch in diameter, drilled through the pencil marks in each parietal bone, about two inches from the meatus auditorius: a piece of stiff, straight wire is then passed through these two holes, and the cranium nearly filled with white pepper seed. The skull is then

held in the left hand, with the face resting on the palm; the seed being well packed with the finger or steel strike, and a candle placed nearly between the eye and foramen magnum, all the seed above the inserted wire is drawn out through the foramen by means of a strike made of a piece of stiff steel, half an inch wide, first filed straight on the edge, and then bent laterally so as to draw out the seed from the sides of the cranium. By working the strike about until it rested on both the wire and anterior margin of the foramen magnum, and examining how the surface of the seed coincided with these two points of the measurement, by inspection through the foramen with a due management of the light, the capacity can be obtained in a much more satisfactory manner than was at first anticipated. The seed is then transferred to the tin tube, and its quantity ascertained as in measuring the total capacity.

The *capacity of the posterior chamber* is obtained by deducting the capacity of the anterior chamber from that of the whole cranium.

The points through which the plane was drawn in the two last measurements, was preferred to one drawn from the meatus auditorius, so that it should be vertical when the head was placed in its natural position when in life; because the irregular form of the meatus prevented its being a fixed starting point; and the difficulty of determining the living position of the head (which must have depended entirely on the eye, and might have been materially affected by the disposition of the light,) would have thrown a degree of uncertainty and irregularity over the results. A line drawn through the centre of the meatus, however, and the one adopted, generally coincided within a quarter of an inch.

NOTE.—It will be observed that all the measurements have not been obtained in respect to every skull, which has chiefly arisen from the imperfection of some of the crania, while a few others came to hand so late as to preclude the possibility of taking the more difficult measurements.—All the Peruvians marked with a star are from the Temple of the Sun, (see page 132.) The figures in the first column refer to corresponding numbers in my Catalogue of Crania, and are inserted here for the purpose of reference, and to give greater facility in comparing and correcting the measurements hereafter. The number in the second column refers to the corresponding plate in this work. The Table was considerably extended during the progress of the work through the press, which will explain some slight differences between it and the results as stated in the preceding pages.

TABLE OF ANATOMICAL MEASUREMENTS.

NATIONS OR TRIBES.	No. in Catalogue.	Plate.	Longitud. diameter.	Parietal diameter.	Frontal diameter.	Vertical diameter.	Inter-mast. arch.	Inter-mast. line.	Occipito-frontal arch.	Horizontal periphery.	Length of head and face.	Zygomatic diameter.	Facial angle.	Internal capacity in cubic inches.	Capacity of anterior chamber.	Capacity of posterior chamber.	Capacity of cerebral region.	Sub-coronal region.
* Peruvian.	75		6.6	6.	4.6	5.1	15.5	4.1	13.5	19.8	7.8	5.5	72°	83.5	36.5	47.	14.5	69.
* Peruvian.	76		6.5	5.	4.1	4.9	14	4.	13.5	18.6	7.8	4.7	73°	64.	23.	41.	11.9	11.9
* Peruvian.	77		6.6	5.7	4.2	5.2	15.5	4.4	13.	19.4	7.8	5.5	75°	75.	35.	30.	12.25	62.75
Peruvian.	79		6.6	5.7	4.5	5.3	15.	4.4	13.9	19.3	7.9	5.3	74°	74.5	31.5	43.	11.4	63.1
Peruvian.	81		5.8	5.7	4.4	5.3	15.2	4.3	13.3	18.3	7.9	5.1	76°	79.	32.25	46.75	18.	61.
Peruvian.	82		6.6	5.6	4.5	5.4	15.5	4.	13.8	19.2	8.	5.4	79°	75.	31.5	43.50	16.1	58.9
* Peruvian.	85	11-B	6.3	5.8	4.5	5.3	15.	4.	13.2	19.	7.2	5.5	80°	76.5	30.	46.5	12.25	64.25
* Peruvian.	86	11	6.1	6.	4.7	5.5	16.	4.5	14.1	19.5	7.8	5.4	81°	83.	33.5	49.5	15.75	67.25
* Peruvian.	87	8 & 9	5.8	5.7	4.4	5.1	14.5	4.1	12.7	18.4	7.4	5.	75°	71.75	28.75	43.	11.4	60.35
* Peruvian.	699		6.6	5.6	4.4	5.2	14.8	4.	13.6	19.2	7.8	5.2	74°	72.	26.5	45.5	9.25	62.75
* Peruvian.	90		6.3	5.5	4.2	5.	14.5	3.7	13.2	18.5	7.6	4.9	75°	70.	28.5	41.5	12.6	57.4
Peruvian.	91		6.2	5.8	4.3	4.9	14.5	4.1	12.6	18.7	7.4	5.2	73°	66.5	25.	41.5	9.7	58.6
* Peruvian.	92		6.8	5.4	4.5	5.3	14.7	4.2	14.	19.5	7.8	5.7	75°	74.5	34.50	40.	13.5	61.
* Peruvian.	93		6.1	5.9	4.6	5.2	15.2	4.1	13.2	19.2	7.7	5.2	75°	76.5	34.25	42.25	14.2	62.30
* Peruvian.	95	11-A	6.7	6.	4.5	5.6	16.2	4.5	14.5	20.2	8.	5.6	80°	89.5	34.	55.5	20.5	69.
* Peruvian.	96		6.4	5.9	4.5	5.	14.1	4.2	13.4	19.4	7.5	4.9	73°	68.	31.5	36.5	12.2	55.8
* Peruvian.	97	11-D	6.5	5.5	4.6	5.6	14.8	4.5	13.6	19.5	7.9	5.6	75°	68.5	33.	35.5		
* Peruvian.	100		6.2	5.5	4.4	5.	13.6	3.8	12.6	18.7	7.3	5.	70°	60.	27.5	32.5	12.5	47.5
* Peruvian.	400		6.5	5.7	4.4	5.2	14.7	4.3	13.4	19.5	7.8	5.5	76°	70.	30.5	39.5	13.1	56.9
* Peruvian.	697		6.7	5.5	4.6	4.9	14.1	4.	13.4	19.5	8.	5.5	73°	71.	32.5	38.5	10.5	60.5
* Peruvian.	402		6.9	5.6	4.4	5.3	15.2	4.1	14.	20.2	8.	5.5	77°	78.5	34.	44.5	11.8	66.2
* Peruvian.	403		6.6	5.6	4.3	5.3	14.9	3.9	13.8	19.5	7.6	5.2	74°	79.	31.	48.	15.5	63.5
* Peruvian.	405		5.9	5.6	4.3	4.9	14.5	3.9	12.9	18.4	7.4	4.9	75°	62.	23.5	38.5	10.1	51.9
* Peruvian.	406		6.3	5.7	4.3	5.3	15.	3.9	13.7	19.	7.5	4.8	76°	75.5	29.5	46.	12.4	63.5
* Peruvian.	446	11-C	6.	5.9	4.4	5.	15.5	4.	13.2	19.	7.6	5.4	80°	77.	28.	49.	11.3	65.7
Peruvian.	447		6.5	5.9	4.6	5.1	14.9	4.	13.2	19.2	7.8	5.4	74°	71.	29.	42.	10.3	60.7
Peruvian.	448		6.1	5.7	4.5	5.	15.	4.	12.9	18.7	7.9	5.3	74°	74.	32.	42.	14.9	59.1
Peruvian.	449		6.3	6.1	4.9	5.3	16.	4.4	13.2	19.5	8.	5.5	77°	83.5	35.5	48.	19.5	64.
* Peruvian.	450		5.9	6.	4.7	5.	15.	4.1	12.6	19.1	7.6	5.3	75°	74.5	35.	39.5	14.3	60.2
Peruvian.	451		6.8	5.4	4.3	5.6	14.6	4.3	14.3	19.5	7.8	5.2	78°	87.	31.	56.	19.75	67.25
Peruvian.	452		6.3	5.8	4.4	5.2	14.4	4.2	13.2	19.2	7.8	5.4	69°	83.	34.	49.	11.5	71.5
* Peruvian.	685		6.3	5.3	4.4	4.6	14.	3.9	13.	18.7				69.	29.	40.	12.3	56.7
Peruvian.	686		6.4	5.5	4.3	5.2	14.8	4.	13.2	19.	7.6			71.	38.	33.	14.4	56.6
Chimuyan.	11	6	6.5	5.4	4.2	5.2	14.3	3.8	13.4	18.8	7.6	4.9	76°	67.5	28.5	39.	10.25	57.25
Quichua.	637		7.	5.2	4.4	5.2	14.6	4.	14.4	19.5	8.2	5.2	70°	79.	33.	46.	17.5	61.5
Atacames.	651		6.6	5.3	3.8	5.2	14.5	3.9	14.	19.2	8.	5.1	73°	75.	29.	46.	14.5	60.75
Atacames.	652		6.6	5.4	4.3	4.8	14.2	4.	13.1	19.5	7.8	5.	74°	74.	27.5	46.5	8.75	65.25
Atacames.	653		7.2	5.5	4.4	5.1	14.8	4.1	13.7	20.2	8.2	5.4	76°	80.	34.25	46.75	13.3	66.7
Araucanian.	654	68	6.7	5.4	4.7	4.9	14.2	4.1	13.4	19.5	7.8	5.	72°	77.	32.	45.	11.9	65.1
Araucanian.	655	66	6.9	5.4	4.1	5.4	15.	4.1	14.2	19.5	8.	5.	76°	84.5	32.5	52.	19.	65.5
Araucanian.	656		6.6	5.3	4.2	5.	14.2	4.	13.8	19.	7.9	4.9	76°	75.	26.	49.	15.25	59.75
Mexican.	714	61	7.1	5.6	4.6	5.5	15.5	4.1	15.	20.2	8.3	5.2	80°	87.				
Mexican.	559	17	6.8	5.5	4.6	6.	15.6	4.4	14.6	19.9	8.1	5.3	80°	89.5	33.5	56.	19.5	70.
Mexican.	715	59	6.3	5.3	4.4	5.4	14.3	4.2	13.5	19.2	7.7		76°	74.				
Mexican.	499		7.1	5.6	4.5	5.4	15.2	4.3	14.2	20.	8.4	5.3	73°	87.5	36.25	51.25	19.25	68.25
Mexican.	716	60	6.6	5.3	4.4	5.4	14.	4.	14.	19.3	7.8		77°	76.				
Mexican.	A.N.S.	16	7.1	5.7	4.4	5.2	15.9	4.	14.	20.5	8.4	5.5	72°	83.	39.	44.	17.5	65.5
Mexican.	717		7.	5.3	4.3	5.3	14.5	4.1	14.	20.			78°	77.				
Mexican.	681	17-A	6.6	5.3	4.3	5.2	14.6	4.1	13.6	19.	7.5	5.4	77°	74.	28.	46.	11.5	62.5
Mexican.	718		6.8	5.5	4.8	5.7	15.9	4.	14.6	19.9	8.	5.4	76°	77.				
Mexican.	682		7.	5.4	4.3	5.3	15.	4.1	14.	19.8	8.	5.4	76°	80.5	36.5	44.	15.5	64.5
Mexican.	720		6.9	5.3	4.5	5.6	14.7	3.9	14.6	19.8	8.1		80°	82.				
Mexican.	A.P.S.	18	6.4	5.7	4.5	5.4	14.6	4.5	13.5	20.2	7.2	5.2	78°	77.	30.	47.		
Mexican.	34	18-A	6.9	5.2	4.2	5.4	14.5	4.1	14.	19.2	8.	5.1	76°	78.	30.	48.	14.25	63.75
Chetimaches.	43		6.5	5.7	4.3	5.9	15.5	4.1	14.	19.1	8.	5.1	77°	80.	30.5	49.5	16.25	63.75
Chetimaches.	70	19	6.9	5.6	4.2	5.9	15.5	4.3	14.	20.	8.5	5.7	71°	85.	39.25	45.75	13.25	71.75
Seminole.	C.		6.9	5.6	4.6	5.3	15.	4.2	13.6	19.8			75°	80.				
Seminole.	707	23	7.1	5.6	4.7	5.5	15.	4.1	14.8	20.3	8.	5.3	78°	89.				
Seminole.	604	22	7.3	5.9	4.6	5.8	15.9	4.4	15.3	20.7	8.4	5.3	72°	93.	35.5	57.5	25.	68.
Seminole.	708		7.	5.5	4.4	5.4	14.9	4.2	14.6	20.1	8.1	5.1	73°	86.				
Seminole.	C.		7.3	5.6	4.2	5.6	15.2	4.7	15.	20.4			73°	82.5				
Seminole.	456	24	7.	5.9	4.5	5.8	14.7	4.6	14.2	20.5	7.9	5.6	81°	91.5	44.	47.5	18.1	73.4

NATIONS OR TRIBES.	No. in Catalogue.	Plate.	Longitud. diameter.	Parietal diameter.	Frontal diameter.	Vertical diameter.	Inter-mast. arch.	Inter-mast. line	Occipito-frontal arch.	Horizontal periphery.	Length of head and face.	Zygomatic diameter.	Facial angle.	Internal capacity in cube inches.	Capacity of anterior chamber.	Capacity of posterior chamber.	Capacity of coronal region.	Sub-cornal region.
Muskogee.	579	26	7.	5.7	4.6	5.3	15.3	4.5	14.4	20.8	8.3	5.8	72°	94.75	42.5	52.25	15.6	79.15
Muskogee.	411		6.8	5.8	4.2	5.6	15.4	4.3	15.	20.	8.5	5.4	74°	89.5	37.25	52.25	18.8	70.7
Uchee.	39	27	6.8	5.4	4.3	5.5	15.	4.4	14.3	20.1			75°	81.5				
Cherokee.	632		7.2	5.2	4.2	5.5	14.5	4.	14.6	20.2			77°	88.	36.5	51.5		
Cherokee.	633		6.8	5.1	4.1	5.2	13.7	3.8	13.7	18.9	7.8		76°	74.	33.	41.	16.	58.
Cherokee.	634		7.	5.3	4.1	5.4	14.5	4.	14.	19.5	8.3		74°	81.	32.5	48.5	19.2	61.8
Cherokee.	635		6.6	5.1	3.8	4.9	13.4	3.6	13.8	18.5		4.5		70.			18.	52.
Cherokee.	B.	25	7.2	5.3	4.3	5.3	14.1	4.5	14.	19.1			77°	82.	35.	47.	12.25	69.75
Choctaw.	408		7.2	5.	4.2	5.5	14.6	3.9	14.7	19.2	8.4	5.1	74°	79.	28.	51.	13.7	65.3
Sauk.	561		7.4	5.9	4.6	5.5	15.3	4.3	15.	21.	8.	5.6	84°	96.5	41.5	55.	24.25	72.
Ottigamie.	639	31	7.	5.9	4.7	5.5	15.3	4.7	14.2	20.9	8.1	5.8	82°	91.5	40.	51.5	12.75	78.75
Ottigamie.	415		6.9	5.9	4.7	5.5	15.	4.2	14.2	20.2	8.2	5.4	76°	89.5	34.	55.5	19.25	70.25
Potowatomie.	657	34	7.8	5.7	4.4	5.3	16.	4.	15.8	22.1	8.2	5.2	80°	98.	35.5	62.5	19.	79.
Chippeway.	683	28	7.3	5.8	4.8	5.5	15.1	4.6	14.2	20.9	8.	5.5	84°	94.	43.	51.	14.75	79.25
Chippeway.	684		7.2	5.5	4.3	5.5	14.8	4.1	14.6	20.2	8.3	5.5	73°	85.5	35.	50.5	13.2	72.3
Menominee.	35		6.7	5.6	4.2	5.1	14.3	4.4	13.5	19.5	7.9	5.4	72°	72.5	33.5	39.	14.1	58.4
Menominee.	44		6.8	5.4	4.3	5.5	14.	3.2	14.	19.7	7.9	5.4	75°	74.				
Menominee.	78		7.3	5.7	4.5	5.3	14.2	4.5	14.2	21.	8.1	5.6	78°	85.25	38.	47.25	13.75	71.5
Menominee.	454	29	6.8	5.6	4.2	5.5	14.7	4.1	14.1	19.9	7.7	5.2	79°	86.5	36.5	50.	15.5	71.
Menominee.	453		7.1	5.8	4.5	5.4	14.9	4.6	14.1	20.6	8.2	5.8	75°	87.	37.5	49.5	13.5	73.5
Menominee.	563		6.9	5.7	4.5	5.3	15.3	4.5	14.	20.4	8.1		76°	83.5	40.	43.5		
Menominee.	W.		7.1	5.6	4.4	5.4	14.8	4.3	15.	20.5			75°	83.5	33.	50.5	21.	62.5
Menominee.	80		6.6	5.4	4.2	4.9	14.2	3.9	13.6	19.3	8.	5.1	74°	71.5	30.	41.5	16.25	55.25
Massasauga.	27		7.	5.2	4.3	5.2	13.8	4.1	14.2	19.5	8.2	5.2	76°	77.5	29.	48.5	13.25	64.25
Lenapé.	40	32	7.	5.5	4.6	5.1	14.4	4.2	14.5	20.	8.1	5.	76°	78.5	33.	45.5	16.25	62.25
Lenapé.	630		7.8	5.4	4.4	6.2	15.6	4.3	16.	21.5	8.8		80°					
Minsi.	568		6.7	5.	4.2	5.3	14.	4.1	13.8	19.3	7.6		78°	72.				
Manta.	418		7.	5.1	3.9	5.3	14.6	3.9	14.	19.5	7.9	5.2	79°	74.5	30.	44.5	16.75	57.75
Quinnipiak.	26		7.	5.7	4.7	5.3	15.1	4.1	14.1	20.2	7.8			77.	34.5	42.5	15.	62.
Gepepscot.	P. C.		6.8	5.1	4.2	5.6	14.5	4.	14.4	19.	7.9	5.2	76°	77.5	31.	46.5	20.	57.5
Miami.	407		6.9	5.5	4.3	5.5	14.5	4.1	14.	19.8	7.9		75°	79.75	33.25	46.5	17.1	62.65
Miami.	542	30	7.3	5.5	4.3	5.5	14.6	4.6	14.9	21.	8.4	5.5	75°	90.	33.5	56.5	13.5	76.5
Miami.	562		7.	5.1	4.2	5.6	14.5	4.2	14.1	19.5	8.		78°	82.5	36.5	46.	15.5	67.
Miami.	541		7.6	5.3	4.3	5.5	15.	4.1	15.5	20.5	8.5	5.1		91.				
Natick.	38		6.7	5.2	4.1	5.7	14.5	4.1	14.3	19.	8.2		73°	77.75	28.	49.75	13.9	63.85
Natick.	84		6.9	5.4	4.3	5.3	14.3	4.1	13.9	19.9	7.9	5.1	78°	83.	35.	48.	18.	65.
Natick.	694		6.9	5.1	4.1	5.1	13.1	4.1	14.	19.2	8.1		70°	77.25	30.	47.25	10.3	66.95
Natick.	693		6.7	5.2	4.3	5.3	14.2	3.9	14.1	19.1	8.2		78°	77.5	30.	47.5	14.5	63.
Natick.	498		7.	5.1	4.1	5.2	13.5	4.1	13.9	19.5	8.	5.	75°	77.5	28.	49.5	12.1	65.40
Natick.	690		6.7	5.3	4.5	5.3	14.	4.	14.4	19.5								
Natick.	688		7.4	5.7	4.4	5.7	15.	5.	15.	21·5	8.3	5.8	79°	100.	38.	62.	20.1	79.90
Natick.	689		6.9	5.2	4.2	5.5	13.3	4.1	13.7	19.5			77°	77.				
Natick.	691		7.	5.1	4.3	5.1	13.5	4.1	14.1	19.6	8.5	5.1	73°	77.	32.5	44.5		
Natick.	692		6.9	5.1	4.	5.2	13.9	4.1	14.2	19.	8.2	4.9	72°	70.				
Naumkeag.	567	33	6.9	5.	4.2	5.3	14.3	3.9	14.4	19.	8.	4.8	80°	71.	26.	45.		
Naumkeag.	631		7.4	5.5	4.4	5.9	15.	4.3	14.	18.7				93.5	33.	60.5		
Shawnee?	606		6.9	4.9	4.1	4.4	13.5	3.9	14.	18.7	7.7		78°	71.			15.4	55.60
Dacota.	605	39	6.7	5.7	4.2	5.4	14.7	4.4	13.5	19.8	7.8	5.2	77°	85.	36.	49.	16.6	68.40
Assinaboin.	659		7.6	5.8	4.6	5.1	14.9	4.3	14.9	21.2	8.4	5.6	79°	97.	40.	57.	18.75	78.25
Minetari.	650		7.3	4.4	4.4	5.1	14.1	4.1	14.7	20.2	8.5	5.1	74°	84.5	34.	50.5	18.6	65.90
Mandan.	643		7.1	5.4	4.3	5.1	14.2	3.8	14.6	20.	8.2	4.9	77°	82.	31.	51.	25.	57.
Mandan.	644		7.	5.3	4.1	5.3	13.9	4.2	14.1	19.8	8.1	5.	74°	76.5	31.5	45.	14.	62.5
Ricara.	649		7.	5.2	4.1	5.1	13.5	4.	14.	19.5	8.	4.9	76°	71.5	28.	43.5	16.25	46.5
Osage.	660		7.	5.4	4.2	5.5	14.8	4.1	14.5	20.	8.	5.3	80°	82.5	40.5	42.	17.1	65.4
Osage.	54	41	6.5	5.9	4.6	5.3	15.1	4.1	13.4	19.5	7.7	5.7	77°	83.	37.5	45.5	14.1	68.9
Pawnee.	P.	38	6.6	5.4	4.4	4.9	13.7	4.3	13.	19.1	7.5	5.2	75°	70.5	31.	39.5	10.6	59.9
Cotonay.	C.	40	7.1	5.4	4.3	5.1	13.8	4.3	14.	19.9	8.	5.	78°	77.	33.?	44.?	18.2	58.8
Cotonay.	C.		6.9	5.6	4.5	5.3	14.	4.	13.9	20.	8.1	5.1	79°	79.5	38.?	41.5?		
Oneida.	33	36	7.5	5.6	4.1	5.8	14.4	4.3	14.9	20.8	8.5	5.6	74°	92.5	36.	56.5	18.4	74.1
Cayuga.	417	35	7.8	5.1	4.2	5.4	14.2	4.5	15.5	20.8	8.4	5.4	78°	93.5	35.	58.5	11.5	82.
Huron?	607		6.7	5.6	4.1	5.2	14.5	3.9	14.	19.2	7.9		76°	81.5	33.	48.5	17.	64.5
Huron.	15	37	7.2	5.3	4.3	5.5	15.	4.4	14.2	19.8	8.2	5.8	73°	74.	32.5	41.5	9.5	64.
Iroquois.	16		7.5	5.5	4.5	5.7	15.2	1.5	15.1	20.8	8.8	5.5	74°	98.5	41.25	57.25	20.2	78.3
Iroquois.	A.N.S.		7.1	5.4	4.2	5.3	14.3	4.	14.1	20.								
Mingo.	455		7.1	5.5	4.5	5.2	14.7	4.1	14.5	20.2	8.1	5.4	77°	81.5	36.	45.5	18.75	62.75
Chinouk.	457		6.9	5.8	4.3	5.2	14.5	4.1	14.	19.8	8.1	5.4	73°	80.	34.	46.	13.	67.
Chinouk.	578	42	6.7	5.4	4.4	5.3	14.	4.2	14.	19.4	7.8	5.3	76°	74.	33.	41.	14.	60.

Skulls from Caves in the Valley of Ohio.	No. in Catalogue.	Plate.	Longitud. diameter.	Parietal diameter.	Frontal diameter.	Vertical diameter.	Inter-mast. arch.	Inter-mast. line.	Occipito-frontal arch.	Horizontal periphery.	Length of head and face.	Zygomatic diameter.	Facial angle.	Internal capacity in cubic inches.	Capacity of anterior chamber.	Capacity of posterior chamber.	Capacity of coronal region.	Capacity of sub-coronal region.
Steubenville.	420		7.	6.1	4.6	5.6	15.5	4.2	14.	20.5	8.3	5.5	80°	90.	39.	51.	19.2	70.8
Steubenville.	437	63	6.7	6.	4.6	5.7	16.	4.4	14.1	20.2	8.1	5.6	79°	92.	33.5	58.5	19.25	72.75
Steubenville.	438		6.7	6.	4.5	5.1	15.	4.1	13.5	20.	8.	5.3	80°	84.5	43.	41.5	14.9	69.6
Steubenville.	658		6.7	6.	4.5	5.2	15.	4.1	13.4	20.	8.3		79°	92.5			22.8	69.7
Steubenville.	436		7.	5.8	4.5	5.7	15.6	4.5	14.2	20.5	8.	5.2	77°	88.	39.	49.	15.4	72.6
Steubenville.	439		6.6	5.5	4.3	5.1	14.	4.1	13.7	19.2	8.	5.5	78°	75.			16.3	58.7
Steubenville.	440		7.1	5.7	4.6	5.6	15.	4.4	14.2	20.2	8.1		76°	89.	40.	59.	18.75	70.25
Steubenville.	687		6.2	6.	4.5	5.	14.8	4.	13.2	19.4				72.	35.5	36.5	15.75	56.25
Golconda.	A. N. S.	62	6.7	5.4	4.3	5.5	14.5	4.1	14.	19.3	7.8	4.9	76°	81.	35.25	45.75	18.	63.
Skulls from the Mounds.																		
Circleville, Ohio.	53	51	7.3	5.5	4.4	5.4	14.6	4.2	14.1	20.3	8.2	5.5	76°	86.5				
Tennessee.	T.	55	6.6	5.6	4.1	5.6	15.2	4.4	14.	19.5	8.1	5.3	80°	87.5			15.3	72.2
† Atakapas.	C.		6.5	5.3	4.3	5.7	14.1	4.1	13.6	18.8	7.3	5.	81°	76.				
† Natchez.	F.	54	5.9	6.6	4.6	5.1	15.6	4.4	12.4	19.6			72°	80.				
Santa, Peru.	73	56	6.2	5.4	4.3	4.9	14.6	4.3	13.3	18.5	7.8	5.1	71°	74.5	30.	44.5	14.5	60.
† Rimac, Peru.	414	57	6.9	5.6	4.4	5.1	15.3	4.3	14.	19.7	8.3	5.5	72°	79.	29.5	49.5	14.1	64.9
Rimac, Peru.	412	58	6.5	5.6	4.5	5.	14.7	3.8	13.2	19.2	7.8	5.4	74°	76.5	34.	42.5	13.75	62.75
Rimac, Peru.	68		7.	5.9	4.7	5.4	15.6	3.9	14 2	20.3	8.3	5.4	74°	89.5	37.	42.5	14.75	74 75
Mississippi.	416	52	7.1	5.3	4.5	5.5	14.6	4.2	14.1	20.			79°	85.5			18.1	67.4
Flatheads of Columbia river horizontally compressed.																		
Clickitat.	461	48	6.6	5.8	4.8	5.	14.2	4.2	13.	19.5	7.9	5.6	70°	79.	36.5	42.5	12.75	66.25
Cowalitsk.	573	49	7.	6.1	4.9	4.1	13.9	4.	12.7	20.2	8.6	5.5	66°	75.	28.	47.	6 25	68.75
Kalapooyah.	574	47	6.8	6.3	5.2	4.9	14.8	4.3	13.	20.4	8.6	6.	68°	87.	35.5	51.5	11.2	75.8
Clatsap.	575	46	6.7	6.	5.	4.5	14.9	4.2	13.	19.8	8.3	5.5	70°	78.	26.	52.	8.75	69.25
Killemook.	578	45	6.9	6.3	4.9	4.8	15.7	4.	14.	21.	8.5	5.7	73°	92.	34.	58.	19.3	72.7
Chinouk.	462	43	6.7	5.9	4.7	4.6	14.2	4.	12.9	20.	8.3	5.5	72°	69.	32.5	36.5	9.9	49.1
Klatstoni.	577	44	6.2	6.	4.6	5.3	14.4	4.2	13.4	19.	8.3	5.5	70°	70.	30.	40.	12.75	57.25
Chinouk.	721		6.6	6.	5.	5.5	14.9	4.2	13.1	20.	8.3	6.	67°	84.	35.2	18.8	14.25	69.75
Ancient Peruvians.																		
Atacama.	P.	3	6.5	5.2	4.3	5.1	14.5	4.	13.8	18.5	8.3	5.1	68°	72.5	26.	46.5	14.75	57.75
Arica.	67	4	7.3	5.3	4.3	5.3	14.	4.3	15.	19.8	8.7	5.4	73°	81.5	31.5	50.	16.25	65.25
Peru.	R.	5	6.7	4.5	4.1	4.1	11.5	3.6	14.2	18.	8.8	4.9	61°	65.5	19.75?	45.75	12.75	52.75

MEAN RESULTS OF THE FOREGOING TABLE.

	Toltecan nations, including skulls from the mounds.		*Barbarous nations*, with skulls from the Valley of Ohio.		*American Race*, embracing the Toltecan and barbarous nations.		Flathead tribes 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.
Longitudinal diameter.	57	6.5	90	7.	147	6.75	8	6.7	3	6.8
Parietal diameter.	57	5.6	90	5.5	147	5.55	8	6.	3	5.
Frontal diameter.	57	4.4	90	4.3	147	4.35	8	4.9	3	4.2
Vertical diameter.	57	5.3	90	5.4	147	5.35	8	4.8	3	4.8
Inter-mastoid arch.	57	14.9	90	14.6	147	14.75	8	14.6	3	13.3
Inter-mastoid line.	57	4.1	90	4.2	147	4.15	8	4.1	3	4.
Occipito-frontal arch.	57	13.6	90	14.2	147	13.9	8	13.1	3	14.3
Horizontal periphery.	57	19.4	90	19.9	147	19.65	8	20.	3	18.8
Length of head and face.	53	7.8	78	8.1	131	7.45	8	8.3	3	8.4
Zygomatic diameter.	49	5.3	64	5.3	113	5.3	8	5.7	3	5.1
Facial angle.	55	75° 35′	83	76° 13′	138	75° 45′	8	69° 30′	3	67° 20′
Internal capacity in cubic inches.	57	76.8	87	82.4	144	79.6	8	79.25	3	73.2
Capacity of the anterior chamber.	46	‡32.5	73	34.5	119	33.5	8	32.25	3	25.7
Capacity of the posterior chamber.	46	‡43.8	73	48.6	119	46.2	8	47.	3	47.4
Capacity of the coronal region.	46	‡14.	71	16.2	117	15.1	8	11.9	3	14.6
Capacity of the sub-coronal region.	46	‡61.8	71	66.5	117	64.5	8	67.35	3	58.6
The total capacity being estimated at 100, gives the following proportionate results as parts of 100. Ant. chamb.		42.6		41.5		42.1		40.63		35.1
Post. chamb.		57.4		58.5		60.		59.37		64.9
Coronal reg.		18.47		19.6		19.		15.		20.
Sub-cor. reg.		81.53		80.4		81.		85.		80.

† These three heads are artificially moulded.

‡ The seeming discrepancy in the sums of these two pairs of measurements, arises from the fact that only 46 of the 48 heads measured, enter into each series.

REMARKS.—In the above scale of results, the skulls from the mounds have been classed with the Toltecan division, and those from the caves of Steubenville, &c., with the Barbarous tribes. The great size of the Steubenville crania has considerably enhanced the mean internal capacity of the heads of the Barbarous Nations, so that it exceeds that of the Flatheads of Columbia river; but the latter, as heretofore stated, compare fairly with the average of the entire race. It is curious to observe, however, that the Barbarous Nations possess a larger brain by five and a half cubic inches, than the Toltecans; while, on the other hand, the Toltecans 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-civilised tribes; and the Facial Angle is much the same in both, and may be assumed, for the race, at *seventy-five 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 Mongolian; nor do the feeble analogies of language, and the more obvious ones in civil and religious institutions and the arts, denote anything beyond casual or colonial communication with the Asiatic nations; and even these 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.

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.

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 the fraction) 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 inches.	Largest in the series.	Smallest in the series.
Caucasian.	52	87.	109.	75.
Mongolian.	10	83.	93.	69.
Malay.	18	81.	89.	64.
American.	147	82.	100.	60.
Ethiopian.	29	78.	94.	65.

1. 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
Germans, Swiss and Dutch, - - - -	7
Celtic Irish and Scots, - - - - -	7
English, - - - - - - - - -	4
Guanché (Libyan,) - - - - - -	1
Spanish, - - - - - - - - -	1
Hindoo, - - - - - - - - -	3
Europeans, nation not ascertained, - - -	23
	52

2. The *Mongolians* measured, consist of Chinese and Eskimaux; and what is worthy of remark, three of the latter give a mean of eighty-six cubic inches, while seven Chinese give but eighty-two.

3. 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.

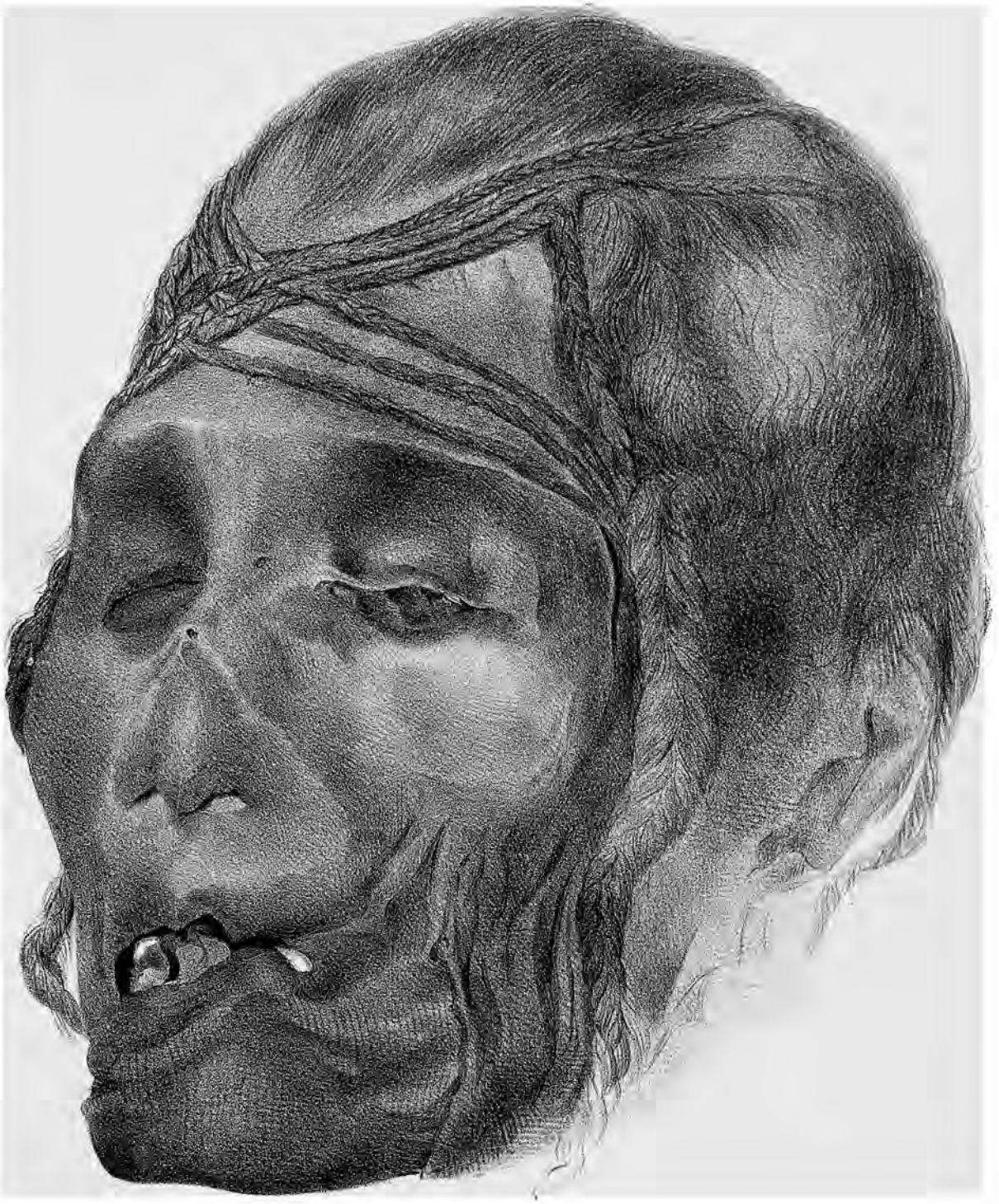
4. The *Ethiopians* were all unmixed Negroes, and nine of them native Africans, for which I am chiefly indebted to Dr. McDowell, formerly attached to the colony at Liberia.

5. 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 cubic inches.
	Mexicans collectively, - - - -	79 cubic inches.
	Barbarous tribes, as per Table, - -	82 cubic inches.

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.

During the laborious task of collecting the facts embraced in the preceding measurements, I have great pleasure in acknowledging the occasional attendance and aid of Dr. Goddard, Professor W. R. Johnson, Mr. Townsend, Mr. R. Pearsall, Dr. J. K. Barnes, Dr. Hardy, and Mr. Robert E. Peterson.

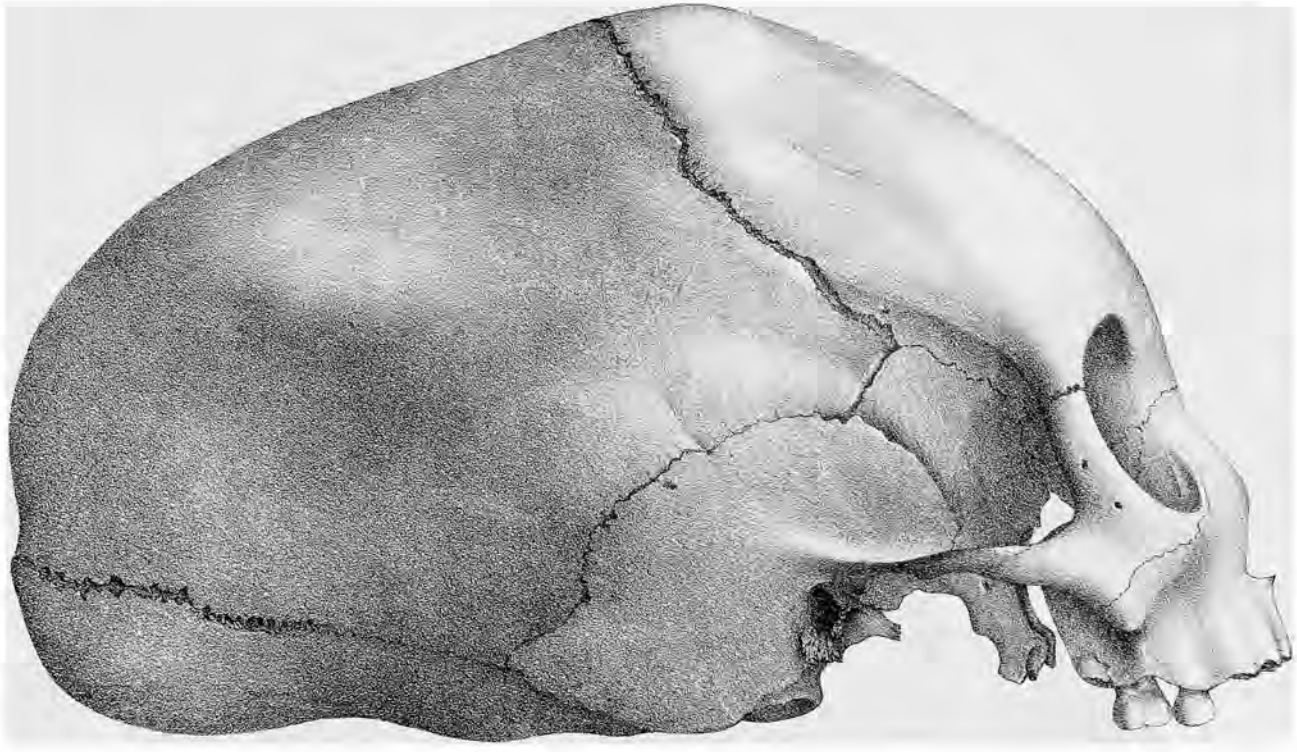


EMBALMED HEAD

FROM THE PERUVIAN CEMETERY AT ARICA.

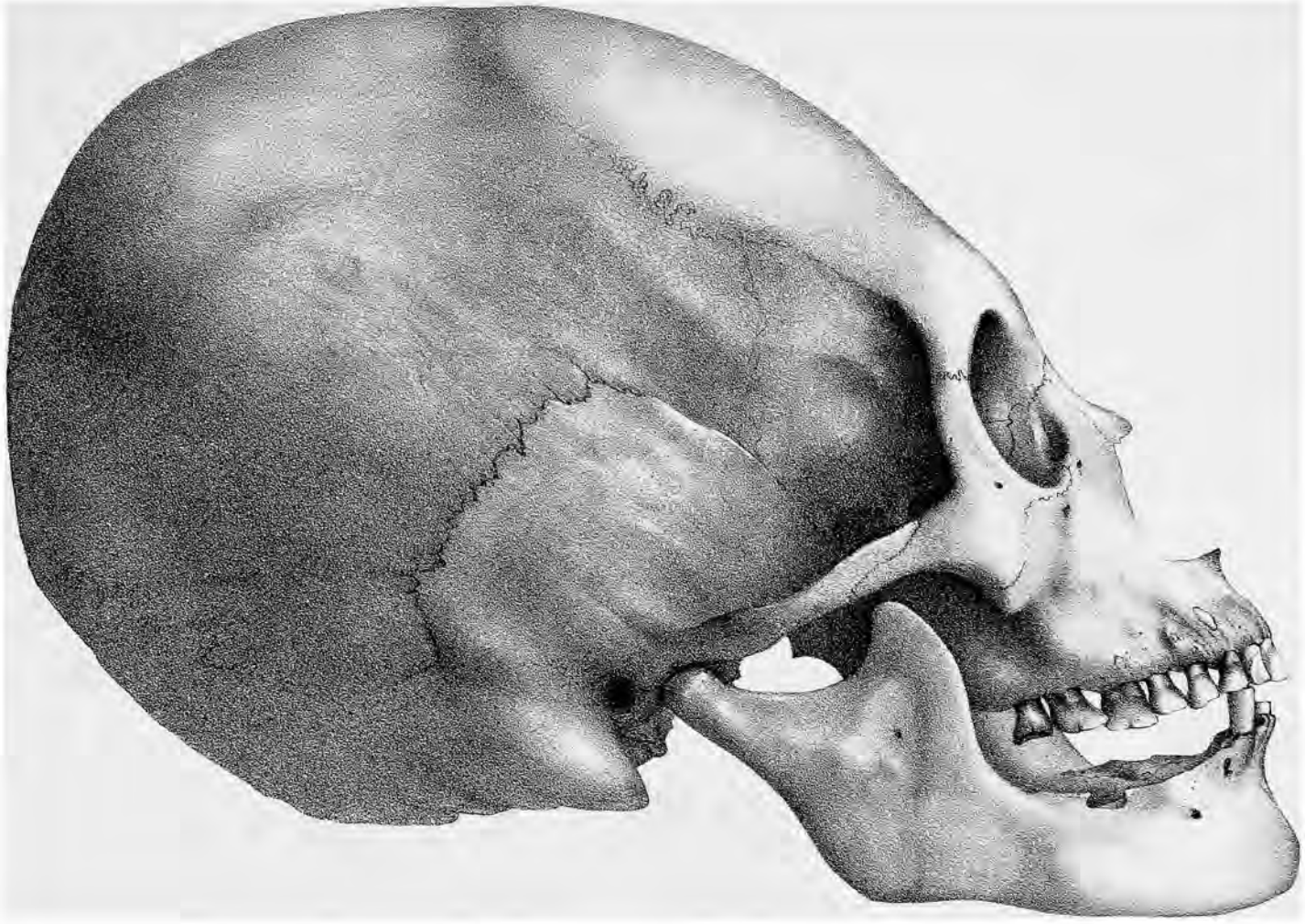
Drawn from Nature and on Stone by A. Hoffy.

Lith. of T. Sinclair, N° 79 S. Third St. Phil.ª



PERUVIAN CHILD from ATACAMA

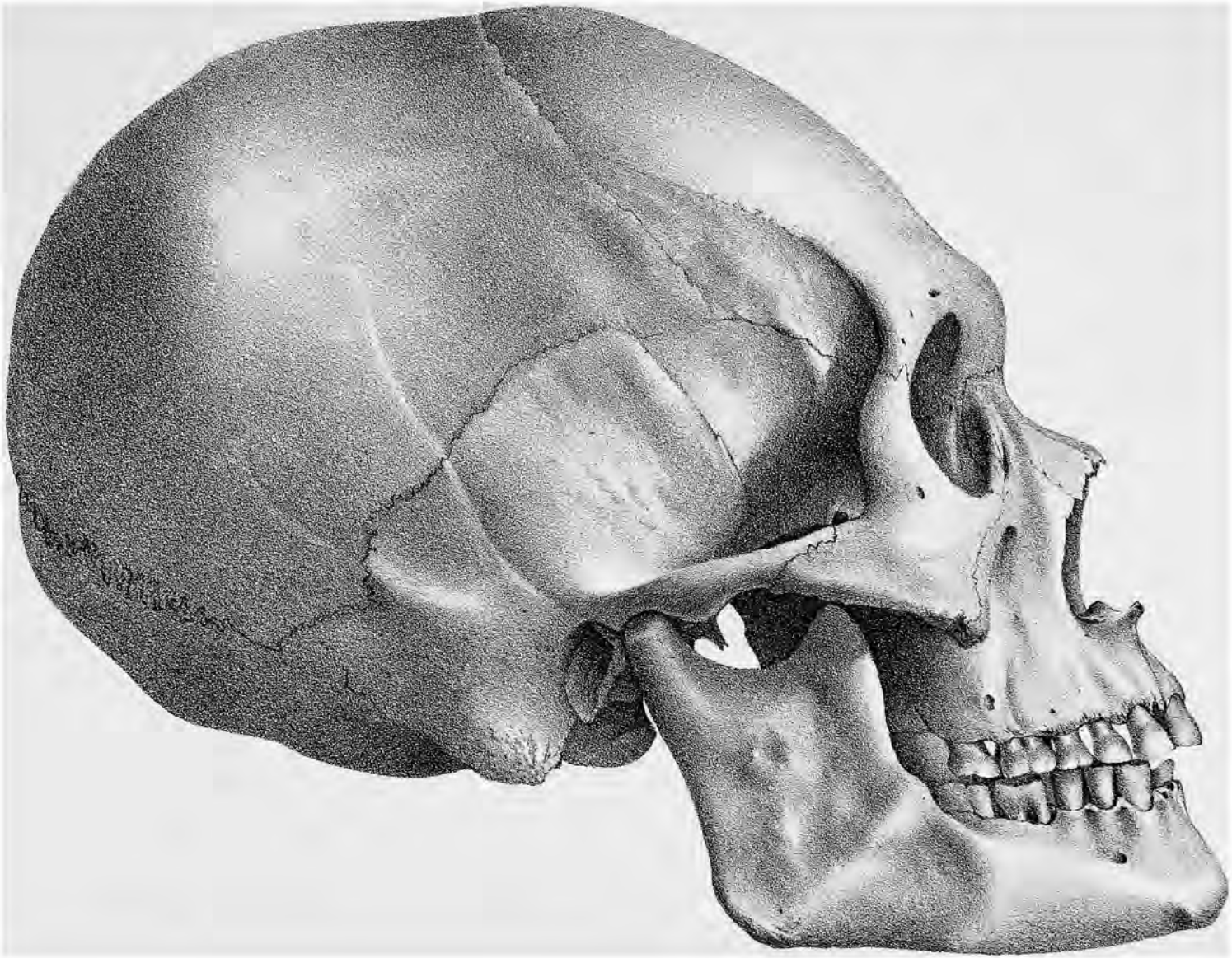
Drawn from Nature and on Stone by John Collins



PERUVIAN

FROM ATACAMA.

Lith. of John Collins. N°79 South Third St. Phila.ª

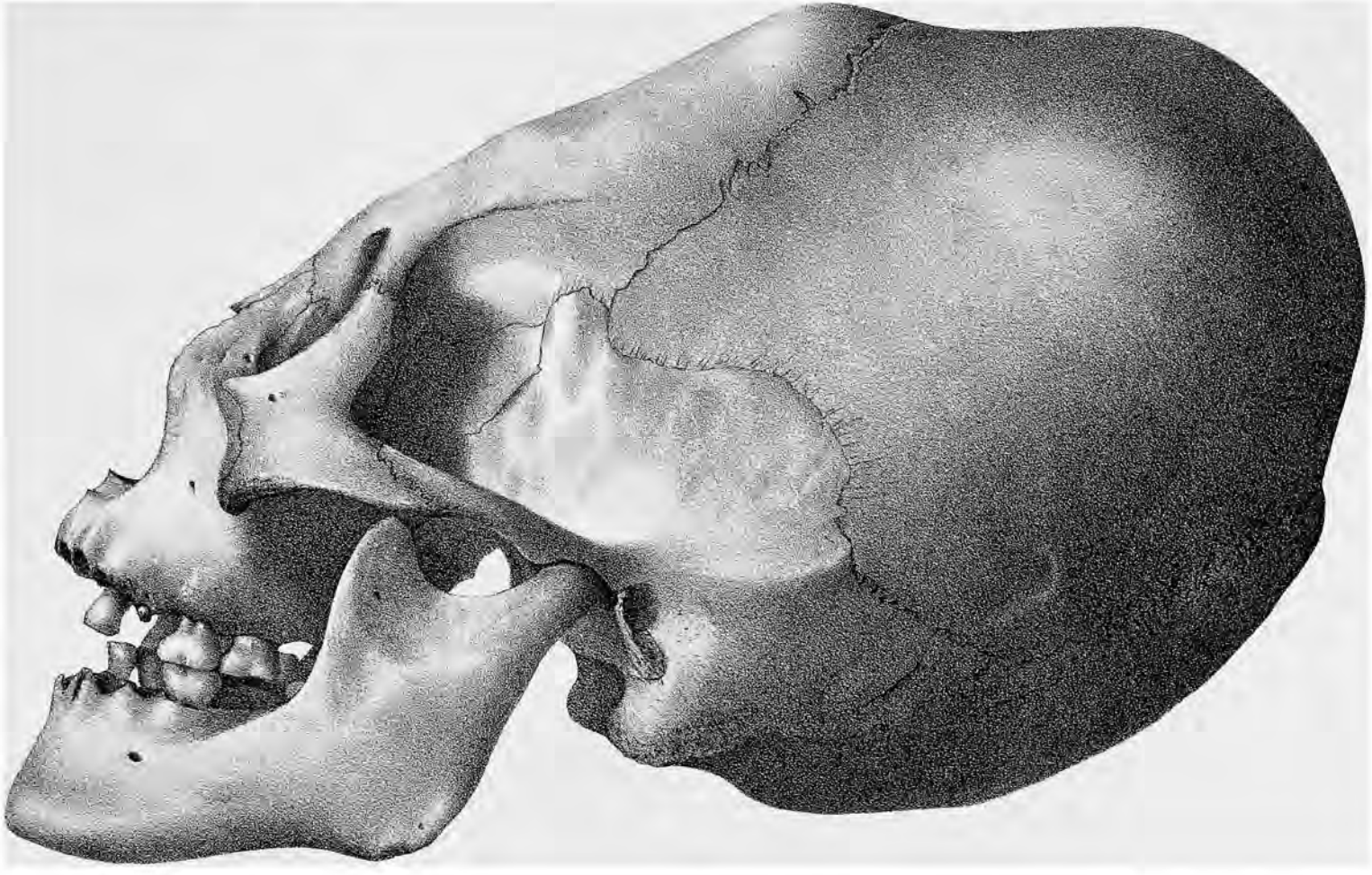


PERUVIAN

OF THE ANCIENT RACE.

From Arica.

Drawn from Nature and on Stone by J. Collins



PERUVIAN

OF THE ANCIENT RACE

Lith. of John Collins, No. 79, S. Third St. Phila.