

In Timbs's first series of *Things not Generally Known*, at page 56, the height and weight of Belgians, French, and English, are given; these I have tabulated.

	Mean Weight of 20.	Height.		Avoirdupois Weight.
		Ft.	Ins.	lbs.
Belgian (Brussels and environs).....	}	5	6 $\frac{3}{4}$	140·49
French (Paris and neighbourhood) .....		5	4	136·89
English (taken at Cambridge) .....		5	9 $\frac{1}{2}$	150·98
English (Passengers & Officers of Ship <i>Clarence</i> )..		5	6	135·76
English Recruits .....		5	5	141·56
Scotch Recruits.....	}	5	6	148·44
Brahmins of Southern India .....		5	5	140·
Hindus of Southern India .....	}	5	4	117·56
Pariahs of Southern India .....		5	5	116·24
Coravas (Tank Diggers of Southern India) .....		5	4	104·54
Mussulmans of Southern India .....		5	4	107·2
Booians { Hill Tribes } .....		}	5	2 $\frac{3}{4}$
Pathnas { of Orissa } .....	5		1 $\frac{1}{2}$	

From this last table it will be seen that the British are superior to most natives of India in height and weight, and that Europeans in general are superior to them in every particular.

The English standard for the foot guards is 5 feet 6 inches, which the average of Europeans attains in the tables. In India, whilst 5 feet 6 inches is the standard for mounted corps, 5 feet 5 inches is that for the infantry, but it frequently varies according to the emergencies of the service. During the mutiny of 1857 it was lowered to 5 feet 3 inches for the infantry. In the tables the Brahmins and Pariahs are the only classes of the natives of India that come up to the infantry standard. Our native soldiers of cavalry and infantry are generally picked men.

XVIII.—*On the Cranial Characters of the Peruvian Races of Men.* By CHARLES CARTER BLAKE, Esq., Lecturer on Zoology at the London Institution, and Hon. Secretary to the Anthropological Society of London.

A FEW observations on the peculiar characters offered by the skulls of the Peruvian races, which have long been regarded by anthropologists as objects worthy of special attention, may be acceptable to the Ethnological Society.

My attention was originally drawn to the subject by having had the privilege of inspecting three interesting skulls, discovered by William Bollaert, Esq., F.R.G.S., at Iquique, province of Tara-

paca, South Peru, from Arica, and from near Cobija in Bolivia, and a fourth from Pachacamac, presented by Mr. John Miller, through Mr. Bollaert, to the Ethnological Society. With a view to identify these skulls, and refer them to their actual ethnic type, my task was to compare them with the extensive collection of Peruvian skulls contained in the Museum of the Royal College of Surgeons, and with the figures and descriptions contained in the works of Owen,\* Morton,† Davis and Thurnam,‡ Rivero and Tschudi,§ Nott and Gliddon,|| Maury,¶ Prichard,\*\* Bellamy,†† Latham,‡‡ D'Orbigny,§§ Meigs,||| Smith,¶¶ Castlenau,\*\*\* Retzius,††† Williamson,‡‡‡ Gerrard,§§§ Busk,|||| Gosse,¶¶¶ Webb,\*\*\*\* Lucae,†††† Barnard Davis,‡‡‡‡ and Wyville Thomson.§§§§

\* Owen, *Catalogue of Osteological Series in Mus. Coll. Chir.*, 2 vols. 4to, 1853.

† Morton, *Crania Americana*, folio, Philadelphia, 1839.

‡ Davis and Thurnam, *Crania Britannica*, 4to. and folio, London, 1856, etc.

§ Rivero and Tschudi, *Antigüedades Peruanas*, 4to, Vienna, 1851.

|| Nott and Gliddon, *Types of Mankind*, 4to, Philadelphia, 1854.

¶ Maury, *Indigenous Races of the Earth*, 4to, Philadelphia, 1857.

\*\* Prichard, *Researches in the Physical History of Mankind*, 8vo, London, 1836.

†† Bellamy, *Annals of Natural History*.

‡‡ Latham, *Varieties of Man*, 8vo, London, 1850.

§§ D'Orbigny, *Voyage dans l'Amérique Meridionale*, 4to, Paris, 1834-47.

||| Meigs, *Catalogue of Crania in the Mortonian Museum*, 8vo, Philadelphia, 1857; *Fragmentary Human Skull from Jerusalem*, 8vo, Philadelphia, 1859; *Form of the Occiput in Various Races of Men*, 8vo, Philadelphia, 1860.

¶¶ Smith, Archibald, *Peruvian Gleanings*, *Edinburgh New Philos. Journal*, 8vo, 1860.

\*\*\* Castlenau, *Voyage dans l'Amérique Meridionale*, 8vo and 4to, Paris, 1851-5.

††† Retzius, *Present State of Ethnology with reference to the Form of the Skull*, Translated by W. D. Moore, *Medico-Chirurgical Review*, 1860, p. 503.

‡‡‡ Williamson, *Observations on the Crania contained in the Museum of the Army Medical Department*, Chatham, 8vo, Dublin, 1857.

§§§ Gerrard, E., *Catalogue of Osteological Specimens in the British Museum Collection*, 8vo, London, 1862.

|||| Busk, *New System of Craniometry*, *Trans. Ethnological Society*, 1861. *Crania Typica*, fol., London.

¶¶¶ Gosse, *Mémoire sur les déformations artificielles du Crâne*, 8vo, Paris, 1855. *Sur les anciennes races du Pérou*, *Bull. Soc. Anthro.*, Paris, i, 549. *Questions ethnologiques et médicales relatives au Pérou*, ii, 86.

\*\*\*\* F. C. Webb, *Teeth and Anthropoid Apes*, 8vo, London, 1860.

†††† J. C. G. Lucae, *Zur Morphologie der Rossen-Schädel*, 8vo, Frankfurt, 1861.

‡‡‡‡ J. Barnard Davis, *Distortions in Crania of Ancient Britons*, *Natural History Review*, ii, 290.

§§§§ Wyville Thomson, *Distorted Human Skulls*, *Nat. Hist. Rev.*, ii, 397.

I have to acknowledge some invaluable suggestions with which my kind friend Professor Owen, F.R.S., has been pleased to favour me, and to record the obligations, which, as a student of craniology at the Hunterian Museum, I am personally under to the late Professor Quekett, unfortunately deceased before the publication of the present paper.

From the sixteenth century to the present time we have been generally acquainted with the Peruvian practice of binding the heads of their young children tightly, with a view to produce mechanical distortion. In the year 1585 a synod of the Roman Catholic Church at Lima condemned this practice, which had been used by the old Aymará, Quichua, Chimu, Chíncha, Atacamans, and Chango races, the autochthonous inhabitants of Peru and Bolivia, prior to the Spanish conquest. Demonstration of the fact that mechanical distortion\* to any great extent has been practised since that time has not been afforded us.

Attention was first attracted to these skulls by the labours of Professor Tiedemann,\* who described the skulls brought by Mr. Pentland from the borders of Lake Titicaca,—“These skulls are remarkable for their unusually great length, the axis from the forehead to the occiput being much longer than what is observed in any other skulls Professor Tiedemann had ever seen, while the lateral axis is proportionally shorter, in consequence of which they seem compressed at the sides. The face is exceedingly projecting, and the forehead very retreating, so that the facial angle of Camper is smaller than in any known race of men. The *os frontis* is continued far back towards the vertex, and is very long, narrow, and flat. The parietal bones are directed partly backwards, and near the coronal suture make a remarkable arch or protuberance. The occipital foramen is large, and its plane looks not downwards and forwards, but somewhat backwards. The zygomatic processes are not prominent.”

Professor Scouler was of opinion that this peculiar and abnormal configuration was due to the practice of confining the child's head for several months after birth within a cradle of a peculiar construction, and pointed out the fact that amongst the Columbian tribes the flat head was considered as a mark of freedom, whilst the normal conformation indicated slavery. I may be excused for repeating his most interesting account of the *modus operandi*, as it indicates the methods of compression in the most graphic manner. “Immediately after birth, the infant is placed in a kind of oblong cradle formed like a trough, with moss under it; the end, on which the head reposes, is more elevated than

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\* Tiedemann, *Zeitschrift für Physiologie*, Translated by Graves, Dublin Journal of Medical Science, No. 15.

the rest. A padding is then placed on the forehead with a piece of cedar bark over it, and by means of cords passed through small holes on each side of the cradle, the padding is pressed against the head. It is kept in this manner upwards of a year, and the process is not, I believe, attended with much pain. The appearance of the infant, however, while in this state of compression, is frightful, and its little black eyes, forced out by the tightness of the bandages, resemble those of a mouse choked in a trap. When released from this inhuman process, the head is perfectly flattened, and the upper part of it seldom exceeds an inch in thickness. It never afterwards recovers its rotundity."

M. D'Orbigny's observations are pregnant with much valuable information. He states that the present Aymarás have the same form of head as the Quichuas, often voluminous, oblong from front to back, and slightly compressed at the sides. Their forehead is slightly arched but retreating, but no head is to be found comparable to the flattened skulls of their ancestors seen in tombs in the Lake of Titicaca, in those of the province of Muñecas, in the wildest part of Carangas, and in the valleys of Tacna." He alleged that the flattening of the skull was confined to the male sex. "We observe in the flattening of the frontal bone, in the projection that it makes over the parietal bones at the upper part (the coronal suture), that there has evidently been compression before and behind, so directed as to force the mass of the brain backwards, by pushing, as it were, the frontal bone over the parietals." The occipital bone was also produced over the parietals, so as to render the originally serrate suture almost squamo-serrate. It appeared that the bandage enveloped the whole parietal bone, at the same time that both the frontal and occipital bones were compressed by flat boards. I shall have to speak more on the subject of the action of the backboard on the occipital bone when treating on the brachycephalic races of the sea-coast.

Why the early Peruvians adopted the practice of flattening the skull, whether as a mark of caste, or through a desire to perpetuate what they deemed a more beautiful form, I must leave to antiquaries to decide.

On the sea-coast, the Chimú, Chango, Chincha, Quichua, and Atacaman races have a different cranial form. Their skulls approach more in their conformation to those of the old mound-builders of the Mississippi valley. Part of this brachycephalism is produced by the constant use of a backboard to support the child's head on; part, in the opinion of the late Professor Morton, is a retention of the old characters of the typical American race, presumed by him to be brachycephalic. The Pachacamac skulls exhibit this conformation most strongly, and indicate a

wholly distinct fashion of compression to that of the dolichocephalic pre-incarial Titicacan flatheads. These latter skulls, which Tschudi terms "Huanca," are apparently deformed, as D'Orvigny has pointed out, by downward pressure on the frontal, and lateral pressure on the parietal bones. Remains from a country conterminous and coextensive in its limits, with that of the modern Aymaras, alone afford us such evidence. A similar distortion is practised by the Clatsap, Kowalitsk, and Calapooyah Indians, from Oregon.

With regard to the pyramidal distortion, which acrocephalic modification is the most pronounced of the brachycephalic type, and approaches towards the conformation of the mound-builders, evidence of this sugar-loaf form has been afforded us from "an ancient town called Chiu-Chiu, or Atacama Baja, situated on the river Loa, at the eastern edge of the desert of Atacama, eight leagues from Calama, and fifty-seven from the Pacific Ocean." This cranium is now in the Mortonian collection.

The dental phenomena presented by the Peruvian skulls have not yet been considered as the importance of such a subject deserves, but Dr. F. C. Webb, the solitary observer on the subject, has called our attention to the fact that "the dentition in an elongated skull of an ancient Peruvian did not present any considerable deviation from the ordinary standard; the premolars were large, and the central upper incisors very concave posteriorly; this last peculiarity, however, was not repeated in other specimens, and curious abnormality presented itself in one Peruvian skull in the College of Surgeons' collection; one of the canine teeth has developed a second cusp on its inner side, giving it the appearance of a premolar."

One of the skulls from Peru in the Pathological division of the Museum of the Royal College of Surgeons, has the nasal fossæ and the orbits nearly closed up, the superior maxillary bones and the orbital portions of the malar and frontal bones having grown into great knobbed and tuberculated masses. The frontal and adjacent parts of the sphenoid and parietal bones are also enlarged and thickened, as well as the palatine, lacrymal, ethmoid, alisphenoid, and the dental alveoli, which are closed up. The posterior half of the skull alone is healthy.

The Mortonian collection of skulls contains 172 crania from Peru, of various types. These Professor J. Aitken Meigs classifies into Aricans, Pachacamac, Pisco, Santa, Lima, Callao, miscellaneous, and elongated skulls from Titicaca, etc.

As a provisional arrangement, I propose to classify the skulls as follows:—

- Dolichocephalic* skulls—
- Titicacans.
- Modern Aymarás ?

*Brachycephalic* skulls—

Modern Aymarás? (D'Orbigny.)

Quichuas.

Chinchas.

Chimús.

Changos.

The fact was pointed out by Dr. Bellamy, that in some of the skulls brought from Peru, a bone was developed at the confluence of the sagittal and lambdoidal sutures, which he termed interparietal. He attempted to identify this with the supraoccipital (3) bone of Owen, and pointed out to its retention in a separate state during adult life as a foetal or embryonic character. The same argument has been made use of by Rivero and Tschudi, but the true nature of the bone is thus enunciated by Owen,—“The interparietal is no constant cranial element, nor is it a dismemberment of one and the same bone of the skull. It is at best only the largest and most common of the accidentally intercalated ‘*ossa wormiana*.’ Sometimes, for example, in the *Cebus* monkey, it is a dismemberment of the backwardly produced frontal bone; more frequently it is the detached upper angle of the supraoccipital; but by this term supraoccipital I signify the totality of the bone 3, confining the term interparietal to its superior and anterior apex when detached, or to the superior and posterior apex on the frontal when it is in like manner detached and wedged between the parietal bones. The inapplicability of the term ‘interparietal’ to the whole of the supraoccipital is strongly manifested in those fishes, *e. g.* the carp and tench, in which the supraoccipital is withdrawn from between the parietals to the back part of the skull, leaving those bones to come into contact, and unite by the normal sagittal suture on the mesial line of the vortex.” Such *ossa wormiana*, as it is well known, are frequently developed from the lambdoid suture, and still more frequently in the mastoid. Compression of the skull, or hydrocephalic diseases, would tend especially to produce such abnormal growth. I transcribe,\* as a curiosity of description, Professor Tschudi’s account of his discovery, “In the children of that part of the primitive inhabitants of Western South America, who were distinguished by a flattened occiput, a bone is found between the two parietal bones, below the lambdoidal suture, separating the latter from the inferior margin of the squamous part of the occiput. This bone is of a triangular shape, its upper angle lies between the *ossa parietalia*, and its horizontal diameter is twice that of its vertical. It coalesces at very different periods with the occipital bones, sometimes in the first

\* Ethno. Soc. Journal, 1848, p. 82.

month after birth, and sometimes not until six or seven years. In one skull belonging to a child about seven years old, with a very flat occiput, this line is separated by the most perfect suture from the squamous part of the occiput, and is four inches broad, and two inches high. In a more advanced age it probably completely integrates with the rest of the skull. I have, however, perceived it in all the skulls of this class which I have examined. On a close scrutiny we generally find traces of it in the *linea semicircularis superior*. This bone, which, in remembrance of the nation in which it is found, I call Os Incaë, corresponds entirely to the *ossa interparietalia* of the Rodentia and Marsupialia. We know that it exists in these classes of mammalia during life, that it also occurs in the foetal state of several pachydermata, ruminantia, carnivora, etc. In the ordinary embryos of man, there are barely some traces on the first months, which, however, soon disappear."

A more philosophical observer, Mr. Cull,\* has remarked, "Triquetral bones are thought to be rare in African crania, and Blumenbach doubts if they are to be found in the crania of any savage races. These small bones, however, are as common in African as in European crania; and they are also as common in the crania of all savage races that I have examined." In one hydrocephalic skeleton now in the College of Surgeons, formerly in the Liston collection, more than one hundred of these bones are found in the lambdoid suture. Morton observed it in a Chimú (called by him Chimuyan) and in a Cayuga skull. In the British Museum is a large handsome skull, belonging to the "Chincha" type, in which the interparietal bone is manifest. In Mr. Edward Gerrard's most useful and valuable catalogue, the locality is marked as from Pasadama (*i. e.* Pachacamac), near Lima. In the collection of the Royal College of Surgeons, on No. 5,711 (a Laplander), Professor Owen remarks, "The suture between the exoccipital and supraoccipital is retained on the right side, and partially so on the left." Here, however, there are numerous Wormian bones in the lambdoidal suture. On No. 5,390

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\* Ethno. Soc. Journal, 1850, p. 238.

† In Dr. G. Williamson's excellent pamphlet (Observations on the Crania contained in the Museum of the Army Medical Department Chatham, 8vo, Dublin, 1857), he mentions the fact that he has observed "interparietals" in an Albanian; a healthy Englishman; two English maniacs and idiots; one Singhalese; two Timmanis; one Kosso; one Krooman; one Fanti; two Ashantees; one Calabar; four miscellaneous Africans; a Burmese or Malay; one Esquimaux. Professor Owen has described it in a Limbu skull in the Nepál collection, British Museum (Report on Nepál Crania, Brit. Association, 1859). In this specimen the interparietal is divided into three distinct centres; one medial and azygos, the two lateral occupying the inferior corners of the interparietal bone. A specimen exhibiting this conformation also exists in the Edinburgh Museum.

(a New Zealander), he says, "The upper half of the supraoccipital has been developed as an interparietal from a separate centre, and has united by a complex dentated suture with the lower half of the supraoccipital." A similar conformation exists in a skull from the Roman burial-place at Felixstow, preserved in the Anatomical Museum at Cambridge, and in the cranium of a Bengalee.\* The law which regulates the repetition of similar characters in skulls of nations aboriginally distinct is termed by Professor J. Aitken Meigs,† of Philadelphia, "homiokephalic representation." Analogous congenital varieties or imperfections may be seen in almost every ethnic type. Professor Meigs applies this law to the distinctive marks of the Peruvian skulls in following manner:—"Two skulls of the same type may belong to very different races. This fact is involved in a curious law of homiokephalic representation which has been entirely overlooked by craniographers, and the neglect of which has, in several cases, led to very curious mistakes. The ancient Avarian skull found at Grafenegg, in Austria, by Count von Brauner, so closely resembled some of the elongated and cylindrically compressed Peruvian skulls, that Von Tschudi declared it to be of Peruvian origin, and supposed that it had been brought over from Peru to Austria with other collections. Professor Retzius, with greater diagnostic skill, pointed out certain differential characters which were overlooked or regarded as of no importance by Von Tschudi, and pronounced the skulls to be indigenous to Europe, and to have belonged to the Avarians. This opinion, which at first gained no support, was afterwards proven to be correct by the discovery of similar skulls at Atzgersdorf, near Vienna, in Savoy, and in the valley of the Doubs. Fitzinger, Troyon, Gosse, and Duvernoy, examined these crania, and confirmed the opinion of Retzius. The first-mentioned observer has shown that they resemble in every particular certain crania found in the Crimea, and described by Rathké and Meyer." This amusing anecdote shows the futility of attempting to found any general classification on the conformation of the skull in the various so-called "species" of mankind. As a test, however, of general ethnic conformity in pure and unmixed savage races, it is a valuable auxiliary, but certainly not a primary ground of classification. The admission of a law of "homiokephalic representation" is tantamount to a surrender of the doctrine of Polygeny upon cranial grounds alone. If we abandon other physical marks of distinction, the higher evidences of language, in the hands of so powerful a

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\* Davis and Thurnam, p. 29.

† Meigs, Description of a Fragmentary Human Skull from Jerusalem, Svo, Philadelphia, 1859, p. 279.

reasoner as the President of the Ethnological Society, may form a more solid base on which our classification may be grounded.

Evidence of the cranial capacity of the Peruvian races has been conflicting. The average of the specimens at Professor Morton's disposition amounted to 75.3 inches. Professor Owen, when describing the capacity of moderately depressed Titicacan crania, observes, "The brain was as large, but was differently placed. Notwithstanding the low character imparted artificially to this skull, the cranial cavity is as capacious as in other American races." Meigs has fixed this cranial capacity, as measured in 341 skulls (including the distorted Titicacans), to be but 80.3 cubic inches.\* The accuracy of Morton's measurements, however, are very doubtful.

I refrain intentionally from giving at present any table of measurements, for the reason that our knowledge is not sufficiently extended, *e. g.* respecting the skulls of the Chimú and Chango races, to enable us confidently to predict the average measurement of their skulls. I am, however, diligently collecting materials for such a comparison.

Dr. George Williamson, in his valuable observations on the crania in the Museum of the Army Medical Department, Fort Pitt, Chatham,† does not mention any crania from Peru, or indeed any part of South America, a fact the more to be regretted, as the ability and skill which he has exercised in the description of those skulls submitted to him, would have rendered his observations on Peruvian craniology peculiarly interesting.

I now proceed to give the characters of the various types of Peruvian skulls known to me.

1. *Titicacans.* Examples—Coll. Sur., Nos. 5,414, 5,415, 5,416, 5,417, 5,418, 5,419, 5,420, 5,421. Mortonian Collection; 28 skulls.‡

In the skulls of this race the annular constriction of the encephalon and mesencephalon is produced by fronto-occipital pressure, aided by parietolateral elongation. Such pressure on the frontal elevates the posterior periphery of this bone in front of the coronal suture.§

2. *Modern Aymarás.*—The Aymarás skulls found at Arica exhibit the normal configuration to a greater extent than in the Titicacans. I am not about to enter into the vexed question whether or not they are the ancestors of the modern Aymarás, which, according to D'Orbigny, have the same brachycephalic heads as the Quichuas.

\* Meigs in Maury, *Indigenous Races of the Earth*, p. 258.

† *Loc. citat.*

‡ Such evidences have been found from L. Titicaca, Arica, Corocoro.

§ *V. supra.*

The Aymará skull in the Museum of the Ethnological Society has the forehead strongly flattened, but the evidences of concentric ligature round the parietals are not so strong as in the Titiacans. It resembles in this character Morton's fourth plate, that of a Peruvian of the ancient race, from Arica. The re-entering notch above the nasal bone is very prominent in this specimen.

3. *Quichuas*. Examples—Coll. Surgeons, 5,422, 5,423. Mortonian collection. 104 crania from Pachacamac, 62 from Pisco, 8 from Santa, 7 from Lima, 1 from Upper Peru.

These skulls exhibit a vertically flattened occiput; a narrow and receding forehead, the glabella being slightly prominent. The acrocephalic or sugar-loaf form predominates. Owen, in his inestimable catalogue, remarks on the variation between the different sides of the skull, which are occipitally flattened. Such variation he suggests may have arisen from the different breasts at which the respective infants were habitually suckled. In one of the College of Surgeons' specimens, the right side, in one the left side, has been flattened. The range of skulls from Pachacamac varies from the globular or oval type, with a slightly depressed coronal suture, which Tschudi terms the "Chincha" skull, to the pyramidal brachycephalic cranium, with a high and vertical occiput, ordinarily termed the "Inca cranium." Morton considered these crania to have been produced naturally, but the peculiar flatness of the occipital region, coupled with the frequent asymmetrical development of the hemispheres, have led other observers to a more philosophical conclusion.

In Morton's most strongly marked Quichua skull the longitudinal diameter was 6.5 inches, the parietal 5.5 inches.

4. *Chinchas*. Examples—Coll. Surgeons, No. 5,424, Brit. Mus., y. Not having seen the Mortonian collection, I am unable to identify how many of the skulls from Pachacamac may possibly belong to the Chincha type.

The skulls of this type are with difficulty distinguished from those of the Quichuas, from which however the specimens I have myself seen differ in the more globular and evenly-rounded, and the less occipitally flattened shape. Those in the Mortonian collection from Pachacamac, however, have the occiput compressed by the use of a backboard in a much greater degree than those in the College of Surgeons or British Museum collections. The British Museum specimen before me is globular and rather brachycephalic, the left parietal projecting, the forehead is retrocedent, the lacrymal fossæ deeply excavated, the occiput globular, the squamosal and frontal touch on the left, but the alisphenoid joins the parietal on the right side, the supraorbitals are moderate. In the Chincha skull figured by Rivers and Tschudi a

slight depression is visible near the coronal suture, possibly due to the action of one constricting bandage passed round the head in a vertical direction.\* The inspection of a very large series of ascertained skulls will alone enable us to decide whether there is really any distinction between the Chincha and Quichua types of cranium. The Chinchas I have seen look like Quichua skulls which have scarcely been submitted to artificial pressure.

5. *Chimus*. Example—Mortonian collection, No. 11.

I am only cognizant of the ethnic character of this type by Morton's plate of the Chimuyan.† The even slope of the calvarium, the greater length of the cranium, the breadth being 5·4, and the length 6·5 inches, distinguish it obviously from any of the Quichua skulls. I am unable, however, to point out any mark of difference between it and the ascertained Chincha skulls I have seen.

6. *Changos*.—Of this low type of savages, which are found on the sea-coast of the Atacama desert, but one skull is known to me. It is that presented by Mr. Bollaert to the Ethnological Society.‡ Its close resemblance to the Quichua skulls from Pachacamac will be obvious to the most superficial observer. The pyramidal shape of the skull, the wide distance between the mastoid processes, preclude any ethnic distinction being drawn between the Chango skull and those of the other brachycephalic races of the sea-coast.

Castlenau, in his plate 1, describes skulls from Cañete, in Peru, which repeat the irregular conformation of the skulls from Sacrificios, Vera Cruz (Mexican). In these skulls the frontal region in front of the coronal suture is more elevated and produced—two wormian ossicles in the coronal suture; many wormian ossicles in the lambdoid, especially on the right side; *meatus auditorius externus* small; alisphenoid distinctly joins the parietal on both sides. In another of the Vera Cruz skulls, also in the British Museum, the posterior portion of the sagittal and part of the lambdoid suture is depressed; a wormian ossicle is in the centre of the lambdoid. Skull 1,314 in the Mortonian collection is that of an ancient Mexican chief, exhumed, together with various aboriginal arms and utensils, from the Cerro de Quesilas, near the City of Mexico; the occiput is of a peculiar form. It is broad, but has very little vertical diameter, owing

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\* A similar slight depression is a frequent character in European skulls. It is present in skulls of alleged high antiquity from Mewslade, in Glamorganshire, and from East Ham, in the Thames valley.

† *Crania Americana*, pl. 6.

‡ Vide Bollaert, *Ethno. Journal*, vol. iii, 1854, p. 156, for the most authentic information respecting the Changos, at the present time not amounting to more than 250 souls.

to the flatness of the crown. The whole head looks as if it had been compressed between two opposing forces, one applied at the top, and the other at the base of the cranium. The occiput of 1353 is singularly distorted and broad, a deep sulcus or fissure extends in the median line, from a little behind the coronal suture entirely back to the foramen magnum, dividing the whole calvaria into two lobes. It is most instructive to find that a similar distortion was practised by the ancient Bolivians and Mexicans. With the deformed skulls from Cañete were found skulls exhibiting the normal type. Castlenau's second plate exhibits skulls from Samson-Machay, on the summit of the Andes. In the same plate is a figure of "*Incas des tombeaux de Caracollo*," which exhibit anything but an Inca (= Quichua) type, as they are frontally depressed, and dolichocephalic. The third plate of an Aymar  from Bolivia shows well the arrangement of the constricting bands which have depressed the frontal and parietal bones.

Professor Zeune (*Ueber Schdelbildung*, etc., p. 19, 20) describes the Peruvian or Inca race as having long skulls, like those of the Soudan negroes. He apparently here refers to the Aymar s, as nothing can be more distinct than the Quichua and Ethiopian forms, although prognathic examples of the form of the former are frequent.

The late Mr. William Clift, in a manuscript note on the Titicacan skulls, alludes to the skeletons found at Pachacamac, "the chief\* in the centre, the head properly formed; a number of supposed immolated slaves, lying at full length, like rays, in a circle round him, having their heads depressed, like the Titicacans," and he adds the sagacious and pithy note, "But this only proves that these slaves might have been Titicacans, and not necessarily Peruvians.—W. C." He was thus the first cranioscopist to recognise the fact that a possible immigration of, *e. g.* Aymar s, may have taken place to Pachacamac during the long historical period during which the temple of Pachacamac was used as a spot to which individuals of many nations were religious pilgrims. It is not, therefore, a matter of surprise that we find skulls from Pachacamac representing many different nations. I have never, however, myself seen, and I believe there is not in the Mortonian collection, any skulls from Pachacamac of a dolichocephalic type.

There are many skulls, however, which have not been observed by scientific observers, *e. g.* of the Caras, the Scyris of Quito many of the Northern Peruvian and Equador tribes. It would be most interesting to know what is the configuration of their skulls.

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\* A Chinch  ? C.C.B.

Abrasion of the incisor teeth is common amongst the skulls of all the Peruvian races. The crowns of the incisors are worn away in such a manner as to functionally resemble molars. The cause of this is obvious. Mr. Bollaert has observed it in nearly all the tribes of the western side of the Andes. It is probably induced by the use of parched *maíz*, of hard *charqui* (jerked beef), of the lime which is chewed with the *coca*-leaf by the Indians. Such a structure has been observed in Egyptians, Guanches, English sailors, Scotch highlanders, skulls of the Stone period in Denmark, and in many other instances where food difficult of comminution, or corrosive in its nature, has been used. The soldiers who fell at Agincourt, who carried each man a bag of parched peas as provision, have their incisors attrited in this manner.

It is very trying to the patience of a cranioscopist to study the pages of Morton.\* Few of the skulls are placed in any uniform position, and the line which is most often† taken as the vertical, *i. e.* that from the junction of the sagittal and coronal sutures to the *meatus auditorius externus*, is more or less diagonal, and at different angles in his plates. But the Chimuyan skull is a glaring example how a type may be obscured by bad artistic illustration. It is neither a side nor a front view, but exhibits part of the orbit of the side opposite to the observer; this precludes any measurement being taken of the length of the skull from the drawing.‡

A plausible hypothesis has been mooted, that the Titicacan flatheads distorted their crania with a view to perpetuate the remembrance of the dolichocephalic character of their ancestors. Retzius has attempted to identify the cranial characters of the "Ancient Peruvians" of Morton (= Titicacans), and the so-called "Huancas" of Tschudi, with those of the eastern dolichocephalic races of South America. He by no means coincided with those authors who consider the brachycephalic mound-builders of the Mississippi valley as the remains of the typical American stock. He pointed out that in the eastern part of the American continent, from north to south, the dolichocephalic type predominated. The remains from the Brazilian bone-caves, described by Castlenau and Lund, with retrocedent and possibly flattened crania, are dolichocephalic; and, according to Retzius, represent the primæval population of Brazil. Whether the flattening of their skulls was artificial or natural may well be doubted. If natural, the succession of crania in Bolivia, Eastern Brazil, and Peru, would be as follows :—

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\* *Crania Americana* of Phil., 1839. † Busk, *Trans. Ethno. Soc.*, 1861.

‡ Pl. 6.

1. Natural Dolichocephali,  
Brazilian bone-caves.  
Oldest builders of Tia-huanaco (?).
2. Artificial Dolichocephali,  
Titicacans.  
Aymarás.
3. Artificial Brachycephali,  
Quichuas or Inca, Pachacamac, Chimús, Chin-  
chas, Atacamans.  
Changos.

After a careful consideration of the subject, the following conclusions are all that I can lay before the Society:—

1. The early nations who flattened their heads were in mental organization, so far as that can be inferred from cranial form, equal to the average American population of the present day.

2. All the deformations I have seen myself are artificial, and not due to any congenial transmission of an acquired peculiarity.

3. The alleged supraoccipital bone in the early Peruvians is not a retention of an embryonic character, but a structure represented in many races of men unconnected with each other.

4. The skulls of the highest antiquity in Peru indicate a race intellectually superior to the early European skulls of the so-called "Stone Period." In none is there any approach to the lower types of the races of mankind, *e. g.* the Australians or Negroes.

5. No peculiarities exist in the dentition.

6. The dolichocephalic flattening, produced by frontal compression, is confined to nations from the highlands of Bolivia; the brachycephalic flattening, produced by compression of the occipital, was practised by the ancient Incas, and the modern nations of Peru and Bolivia.

I have not attempted to give any table of measurements of Peruvian skulls. I regard any attempt at a uniform system of craniometry wholly inexecutable in the present state of science. From the time of Bernard Palissy to the present age various systems have been proposed, none of which, however, have succeeded in adequately rendering the natural curves of the skull to geometrical proportions. I transcribe Bernard Palissy's account of the state of craniotomy in his time.

"Quoy voyant, il me print envie de mesurer la teste d'un homme, pour sçavoir directement ses mesures, et me semble que la sauterelle, la reigle, et le compas me seroient fort propres pour ceste affaire, mais quoy qu'il en soit, ie n'y sceu jamais trouver une mesure assurée, parceque les folies qui estoient en la dite teste luy faisoient changer ses mesures. Adonc ie fus confus, parceque ie trouvais la dite teste tantost d'une sorte, et tantost

d'une autre, et combien qu'aucunes fois il y eust quelque apparence de lignes directes, ainsi que i'apprestais mes outils pour les figurer, soudain, et en un moment, ie trouvais que les lignes directes s'estoient rendues obliques, dont je fus fort estonné, voyant qu'il n'y avoit aucune ligne directe en la teste de l'homme, a cause que sa folie les faisait toutes fleschir, et les rendait obliques."

Dr. Knox has expressed (*Races of Man*) his opinion that peradventure the abnormal dolichocephalic prolongation of the skull of the ancient Aymarás may have been due to natural causes, independent of artificial compression. Any opinion coming from so eminent an anatomist should be received with the greatest deference; I only, therefore, give in this paper the results of my individual opinions, without the discussion of hypothetical topics.

In the masterly treatise of Crull (*Dissertatio de Cranio, etc.*, 12mo, Gröningen, 1810), especial attention is called to the frontally compressed Carib skull, as being one in which the geometrical lines depart from their ordinary proportions. The resemblance between such a Carib skull and the "old Aymará" skulls is manifest.

The brachycephalic skulls from Pachacamac appear to have the occipital foramen further back than most human skulls. This appearance, however, is deceptive; in truth, the position of the foramen to the basi-occipito-sphenoid line is unaltered by the occipital compression, however its position may bear to the glabella-occipital line.

In the erudite memoir by Joseph Barnard Davis, Esq., M.R.C.S., F.S.A., in the *Natural History Review*, July 1862, p. 290, reference is made to the various modes of cranial distortion practised by the early Britons, which are compared with the modes practised by the Peruvians. He states, speaking of the class of brachycephalism which is produced by occipital compression (*tête déprimée par derrière*. Gosse). "Some instances in my collection are very extreme; as that of an ancient Pakomame from Guatemala, that of an ancient Muysca from Facatativo in the plain of Bogotá, and that of an ancient Peruvian. But it is probable that in these tribes a counter-pressure was exercised upon the frontal bone. This was not the practice amongst the ancient Britons. \* \* \* \* In two prepared heads of Quichuas, or Chinchas (men), kindly presented to me by the learned Professor J. Y. Simpson, of Edinburgh, from the Chincha Islands, off the coast of Peru, the parieto-occipital flatness is strongly manifested in the same spot and the same place as in the Lenni-Lenape. It is deeply impressed, extensive, and has been produced without counter-pressure on the frontal bone, therefore no doubt by the cradleboard."

Mr. CULL asked whether the Aymara skulls of the modern period were considered to be those of the descendants of the ancient Peruvians? It was a distinction which ought to be always drawn, whether a people were a race ethnologically or only politically. The Peruvians were now only a political nation, just as the English were, composed of various elements. He regretted the paper had been read in abstract, because he had thus not been able to judge of its conclusion. As it was, he was not prepared to go to the length of those conclusions. He had in his museum specimens of Peruvian skulls; but he had looked in vain amongst the specimens on the table for any like those in his collection, which had been especially selected with regard, as far as possible, to their purity of ethnological features.

Mr. BOLLAERT made some observations on the skulls from Pachacamac, which were generally thought to present the prevailing Peruvian type; but his own impression was, that the people there presented a condition of great mixture, and was composed of elements from east, west, north, south—in-  
deed, from all parts of Peru. Thus the Changos of the coast come up to latitude 20° south; then follow the Aymarás, who extend far towards the east and the interior. The crania before the Society were pure Chango. We hardly know what the term "Chango" means; it is probably only a nickname for the Indians thereabouts, on account of their miserable condition.

Mr. BLAKE said that the Chango skulls on the table were very like the brachycephalic skulls from Pachacamac. There were, however, many allied forms; and a very fine example of the type which Rivers and Tschudi called Chinha was to be found in the British Museum. Some of the skulls alluded to from the island of Sacrificio (Vera Cruz) were closely similar to those from Western Brazil. The Coast races were generally brachycephalic or short headed; but we cannot trace their affinities northwards, as we are ignorant of the cranial forms in Ecuador. Southwards, the aborigines of Northern Chile were cranially dissimilar from the Chango and Atacaman types. There was no affiliation between them and the Brazilian forms. Many of the Titicacan skulls approached closely to the forms from Western Brazil, described by Castelnau. Perhaps they migrated from Brazil. Mr. Blake did not wish to theorize, but merely to lay objective facts before the Society. Evidences of the hitherto unknown conformation of the tribes of Ecuador had been recently found, but they were sculptured, not osteological evidence, but he had no doubt the resemblance was tolerably faithful; and they denoted a race which practised frontal compression, producing a dolichocephalic form of skull.

The PRESIDENT said he had never yet been able to find that the most able craniologist could properly determine the nation from an individual skull. Blumenbach, who had a church-yard full of skulls, was unable to do so. An able anatomist had mistaken a Highlander's skull for a Negro's; but a Scotchman was not a Negro.

Lord TALBOT DE MALAHIDE laughingly thanked the President for his argument for unity.

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