CHAPTER X

ARTIFICIAL CRANIAL DEFORMATION IN SOUTH AMERICA

JUST as the practice of cranial deformation flourished throughout Central America and the Antilles, so in certain parts of South America the custom was at one time widely distributed. Indeed Virchow has stated that in no part of the world has the practice had a more extended diffusion.[1] Although perhaps this cannot be justified, we can say that its distribution is extensive through certain limited, though well-defined areas, and as Karsten has pointed out, it has in many cases the same geographical distribution as the mummification of the dead and some other peculiar customs.[2]

Our present knowledge does not enable us to determine with accuracy the way in which South America was originally populated. There would seem to have been two or more waves of immigration, and a mixture of dolichocephaly and brachycephaly occurs in the early burials, but precisely who these people were and whence they came is not clear. On the arrival of the Spaniards a great part of the country was divided up into a number of different tribes, differentiated both by linguistic and cultural elements, the Empire of the Incas being the result of a skilful welding and absorption of different types. The movements of various parts of the population also from coast to highland and perhaps *vice-versa* add to the complexity of the situation. In discussing head deformation in the continent I cannot do better than follow Mr. T. A. Joyce's example in his admirable *South American Archæology* and consider briefly some of the evidence we possess as to the practice in various geographical areas. The literature is so vast, and my own knowledge of the earlier Spanish chroniclers

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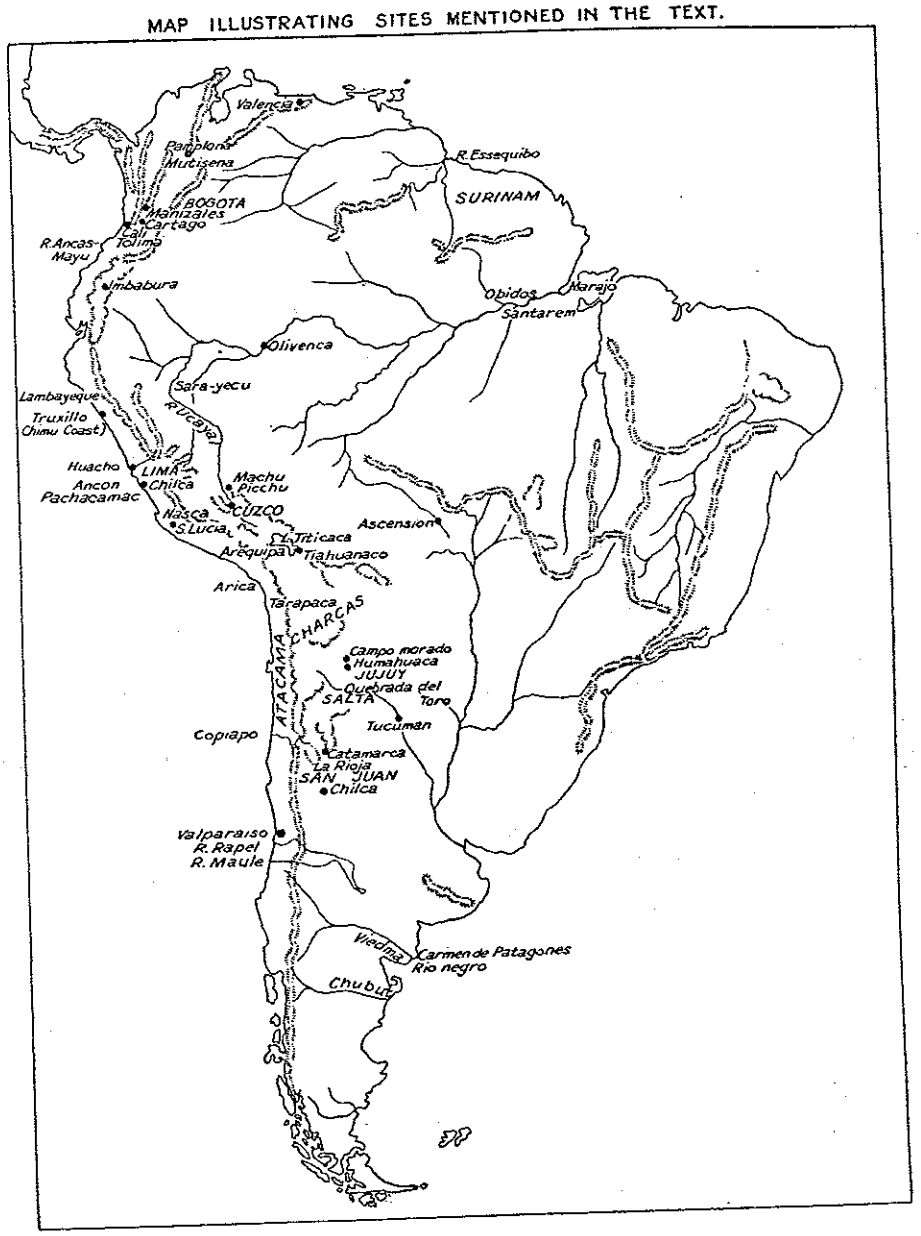
[1] Virchow, 18, p. 5 : for a description of many of the skulls illustrated in the *Crania Ethnica Americana* see Virchow, 13.

[2] See Karsten, p. 60.

Map V.

MAP ILLUSTRATING SITES MENTIONED IN THE TEXT.



so imperfect, that I shall attempt here merely to put together some of the notes that I have collected in the hope that someone more competent than myself may supplement the information and so enrich our knowledge.

It will, I think, be convenient to take the northern and part of the central sections of the country first and discuss what we know of tribes living in Colombia, Venezuela, Guiana and Brazil. Then we shall be in a position to discuss the more important sites from Peru before going southward into Patagonia and the Argentine. At the time of the European invasion the practice of the artificial deformation of the head was common in various parts of Colombia and Venezuela, and doubtless it must have been prevalent for some considerable time before the arrival of the newcomers. Cieza de León mentions in his chronicle that to the north of Cali lived the Chanca in the province of Anzerma in what is now Colombia. He describes their faces as long (*largos*) and broad (*anchos*) for he adds that, as in other parts of the Indies, children have their heads forced into any shape which pleases their parents. Some grow up without any hinder part to their heads (*sin colodrillo*), others have a high forehead and others still have very elongated skulls. These changes are brought about by means of small boards (*tabletas*) which are fastened together by means of ligatures, both sexes being treated similarly.[3]

Again, Fray Pedro Simon in his *Noticias Historiales*, which was published in 1627, is reported to have mentioned the horrible, ugly and ferocious countenances of the natives, with their flattened heads both in front and behind,[4] and Fernandez de Piedrahita, who was Bishop Elect of Santa Marta, describes how boards were used in the Coyaima and Natagaima districts of Colombia, Province of Tolima. As soon as children are born he says, it is the custom to place their heads between two boards (*entre dos tablillas*) so that the forehead is flattened, the people thinking that thereby ferocity of countenance is bestowed, and he adds that some of the Panche tribes imitated them,[5] these latter practising

[3] Cieza de León, p. 85.

[4] Simon, quoted by Salas, pp. 166-167. *Cf.* the words of Juan de Castellanos in Canto IV (vol. I, pp. 122 *ff.*), where he says "horribles gestos, frentes y colodrillos aplanadas."

[5] Piedrahita, Bk. I, cap. 2, p. 12 : *cf.* Restrepo Tirado, 2, pp. 91-92.

also, according to report, a kind of mummification of their dead.[6] Not only did the Panche tribes practise the custom, but also the Quimbaya who were noted for their technical skill in metal working. According to Joyce[7] the usual method adopted among these people was to apply a couple of boards to the forehead and occiput of the infant's head so that the parietals splayed outwards, and he illustrates the point by alluding to the square heads of the clay figurines found near Cartago and Manizales, and now in the British Museum.[8] Restrepo Tirado describes the custom in somewhat greater detail. The boards were arranged so that they formed an acute angle where they met, and occasionally pieces of wood were placed at the sides of the head and the inclination so arranged as to produce the desired form.[9] During excavations at Mutisena, some 20 km. south of Pamplona, sepulchral grottos were discovered. In this region were the famous gold mines found in 1551, which made the inhabitants so insensate that the town gained the nickname of Pamplona la Loca (Pamplona the Mad). Here in ancient times a considerable population must have dwelt, and the burials yield skeletons in which the skulls exhibit artificial deformation. Mummification was also apparently known since the Bogota Museum possesses two bodies reported as coming from this site, but I am not aware if, in these cases, the heads are artificially distorted. In this part of the country methods of deformation varied as is common in other parts of the world. Cases are reported from the banks of the Arauca and elsewhere (e.g. Lake Valencia) in Venezuela, where urn burials are known, and where skulls exhibit a frontal deformation only, the occiput not having apparently been compressed. In one case a cranium showed a formation akin to oxycephaly, although it is doubtful whether this condition was caused by the frontal flattening to which the skull had been submitted. In the valley of Aragua (Lake Valencia) forty skulls were found of which 50 per cent. were deformed, indicating that the custom was not universal among the population but was probably confined to certain classes.[10]

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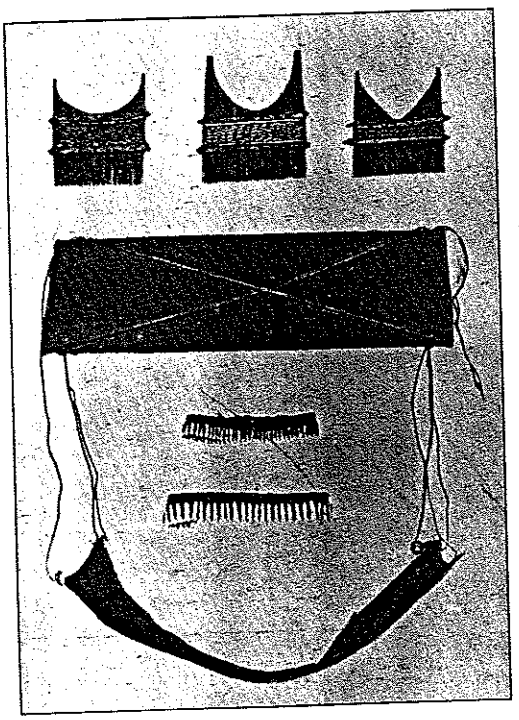
[6] Joyce, 1, p. 35.
[7] Joyce, 1, p. 35.
[8] Joyce, 1, p. 35.
[9] Restrepo Tirado, 1, p. 28.
[10] See Verneau, 4, pp. 354 *ff.*; Marcano, 1, pp. 225 *ff.*: Marcano, 2; Verneau, 2, p. 161.

After *Farabee.*

a

Sipibo Mother and Child.

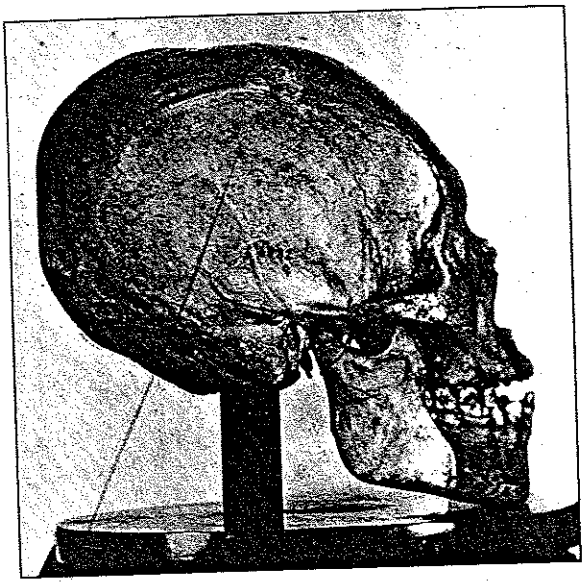


After *Farabee.*

b

Sipibo Head-flattening Board and Woven Arm-bands.

Plate XL.



University College *London.*

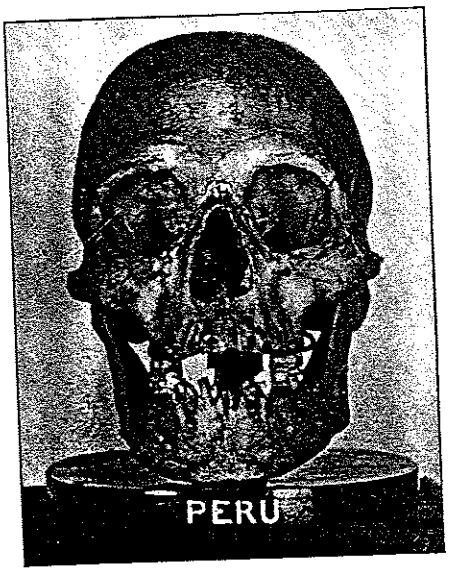
a

Deformed Peruvian Skull.

University College *London.*

b

Deformed Peruvian Skull.



University College *London.*

c

Deformed Peruvian Skull.

Plate XLI.

After *d'Orbigny.*

Peruvian Child Mummy.

In Ecuador, which in early times was very similar to Colombia as regards the culture of its inhabitants, the two systems of coast and highland become more marked. Here diversification begins and as we proceed we shall notice how important these two cultures become when considering artificial deformation of the head. In the northern part of Ecuador the Cara were the principal people, the Cañari and Palta living in the more southern region, although doubtless there was considerable intermixture between the groups. Cranial deformation was commonly distributed in both areas, the methods varying according to popular prejudice, or to factors now difficult or impossible to determine. In graves found at Urcuquí (Imbabura), skeletons were found with skulls showing occipital flattening and also female figurines which exhibited excessive breadth of head.[11] Among some of the people near Manta on the coast Cieza de León ascertained that as soon as the child was born its head was pressed and then placed between two boards (*tablas*) and secured in such a way that when the child attained the age of four or five years, its head was either broad or long, and without any occipital projection. Not content with the heads God had given them, continues the old chronicler, they shape them as seems most agreeable to themselves and some have them broad and some long. This they do because they think that this new shape to their heads will make them healthier and better able to work.[12]

In the south, the Cañari and the Palta also deformed their heads. On the coast, boards were applied to the front and back of the head, allowing compensatory growth both laterally and upwards; and in order to add to the appearance thus created the hair was brushed up so as to add breadth to the head.[13] The fact that such reasons as that understood by Cieza de León are adduced to account for the deformation, and also that the growth of the hair was adjusted so as to increase the effect, have led some authors, notably Karsten, to suppose that the custom has its basis in the idea that evil spirits cannot attack heads thus formed, or at least that they are warded off by their appearance. The wearing of high pointed hats also in order to increase the elongation has been advanced as a further fact which supports this hypothesis. I

[11] Jijón y Caamaño, pp. 221 *ff.*: *cf.* especially Lám. XLVII-LIII & IX.
[12] Cieza de León, p. 177. [13] Joyce, p. 61.

do not think that this theory can be sustained, since it appears to me more probable that the inhabitants have lost the original reasons for these customs and facile rationalizations have taken their place. However, the very similar reasons given to Father Bobadilla in Central America (see page 155) that deformed heads permitted greater ease in carrying burdens might be accepted, as Mr. T. A. Joyce[14] has pointed out to me, since it is obvious that flattened temples are favourable for the purpose of bearing a head band. Nevertheless, we must not be too apt to accept reasons given by natives to inquiring persons who have no means of checking the accuracy of the replies, and who are often too inclined to fit the answer into a mosaic of previously constructed theory. Unless answers to queries are wildly invented on the spot, it is clear that if based on native tradition the reply has some definite meaning. If similar replies to questions bearing on the same topic are given independently by other natives, then the material has undoubted value and needs only knowledge of the facts to interpret its various elements.

The coastal method of deformation is important as it is continued southward into Peru where again it can be sharply distinguished from the highland or so-called Aymara method. The same practice of artificial cranial deformation is also found in modern times amongst the Colorado Indians (Barbarcoa) of Ecuador. Amongst these people the newborn infant is laid upon a plank of the same length and breadth as its body during the first three months after its birth. It is secured tightly to the board by means of a bandage, and under its head are some pieces of cotton and cloth. A rolled up handkerchief passes over its forehead and is secured behind the board. Every day the handkerchief is untied and re-tied more tightly; the result of the practice being that occipital deformation results. Gradually the custom is being given up, and an interesting side-light is thrown upon apparently meaningless customs when we consider the fact that to-day mothers are merely tying the handkerchief loosely over the forehead without using the board at all.[15]

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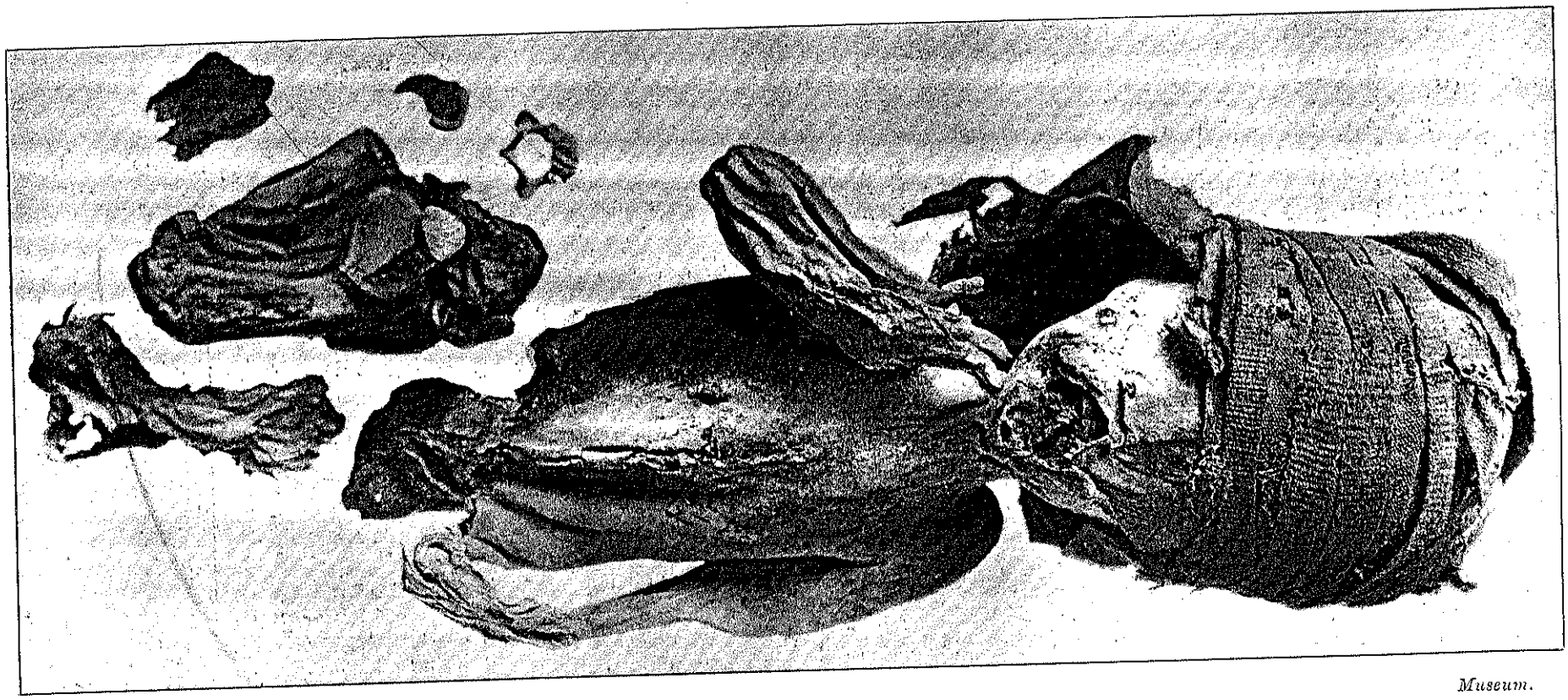
[14] Joyce, 5. I take this opportunity of thanking Mr. Joyce for much valuable criticism and advice.

[15] Rivet, 189.

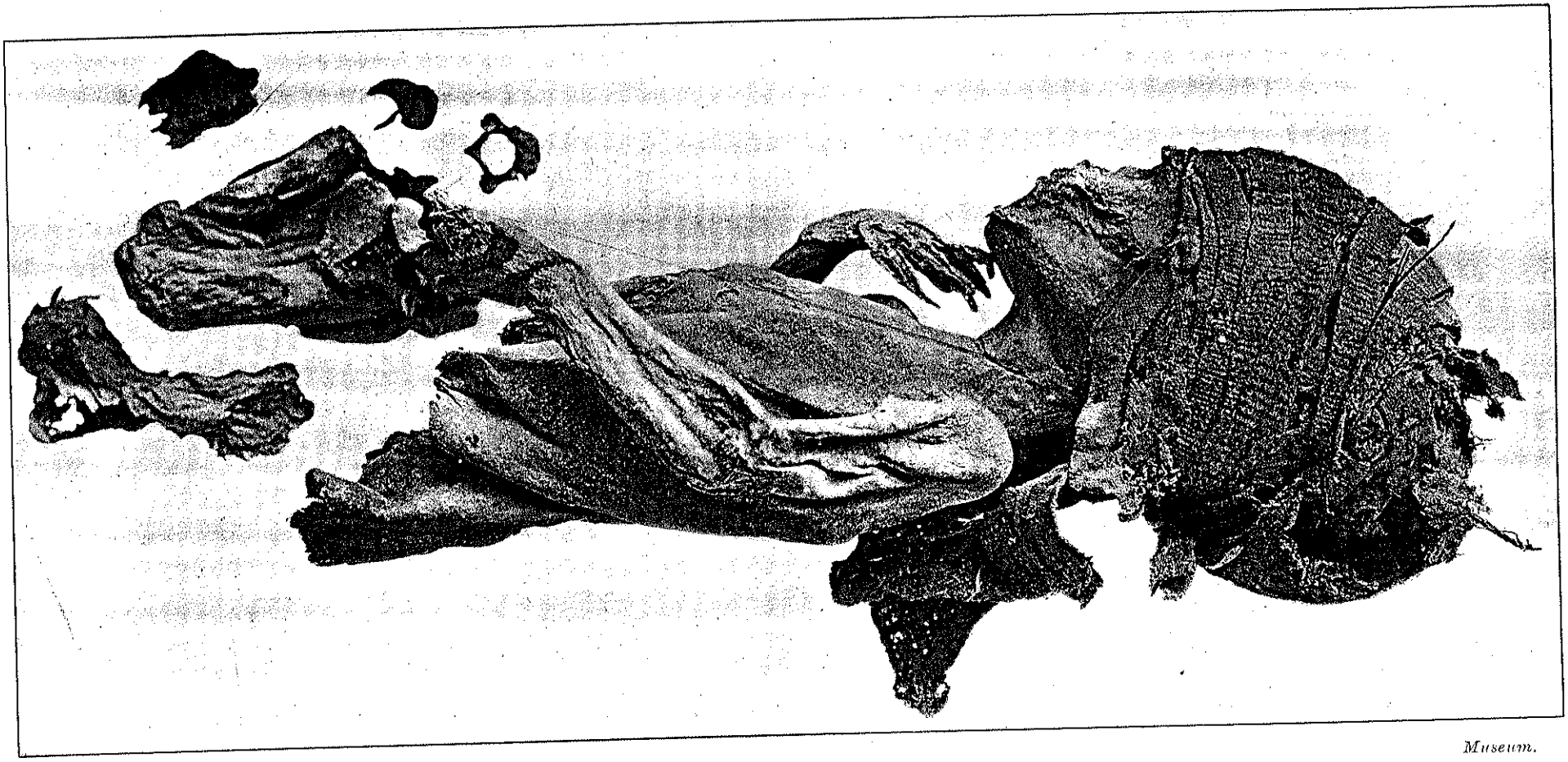
PLATE XLII.



U.S. National Museum.

Peruvian Child Mummy, showing Head Wrappings.

PLATE XLIII.



U.S. National Museum.

Peruvian Child Mummy showing Head Wrappings.

Before we turn to Peru and consider the custom there it will be convenient briefly to discuss the other areas where artificial cranial deformation has been observed up to comparatively modern times. In Dutch Guiana the Carib were noted as deforming their children's heads by J. G. Stedman, who served with the Dutch army at Surinam. He reports that most of these people esteemed a flat forehead as a mark of beauty, and therefore they compressed the heads of their children immediately after their birth.[16] Similarly La Borde declares that the Carib artificially flatten the heads and noses of their children, the mother compressing them at birth and during the time that they are suckled, thinking the result beautiful.[17] Later inquiries suggest that the Maopityan of British Guiana deform their heads, and from what C. B. Brown has written there would seem some reason to suppose that this is correct. He relates how some Taruma Indians approached his party and with them was a Maopityan Indian. His head, the writer reports, "was exceedingly long, narrow and high and had a most extraordinary appearance. This form of head is a manufactured one being produced by the application of two flat pieces of wood to the sides of the head of the infant Maopityan immediately after its birth." The wooden boards are firmly bound together until the head becomes laterally flattened and consequently elongated upwards.[18] Although the Taruma Indians exhibit some lateral flattening this is not considered to be due to artificial distortion;[19] but Im Thurn reports a similar case to that related by Brown. He states that in a remote part of British Guiana or perhaps beyond the frontier near the sources of the Essequibo, there lives a little-known people which was in the habit of tying boards to the heads of its children in such a way as to flatten them. Early writers record the fact that the custom formerly prevailed among all the Carib of this region but it has now fallen into disuse.[20] Similar practices have long been known to exist among the Omagua, a name which means "flat heads," the Tupi term for such being Cambeba, which has

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[16] Stedman, vol. I, p. 398.
[17] La Borde, p. 246.
[18] Brown, C.B, pp. 246 *ff.*
[19] Schomburgk, vol. II, pp. 470-471.
[20] Im Thurn, p. 191: *cf.* Roth, W. E., p. 412.

the same significance in English. Their territory may be said roughly to be along the banks of the Marañón for a considerable number of miles, and they are a people of which we hear a good deal during the earlier days of European occupation. The early expeditions into their country were inspired by the fever for gold and wealth, and it is said that it was from these people that the Portuguese first obtained india-rubber. The Spanish Jesuit Acuña states that when a child is born its head is placed in a press (*en prensa*), a small board (*tabla*) being fastened to the forehead and another against the occiput.

These boards appear to have been much larger than is usually the case. The larger board which was tied against the occiput is described as one on which the child lay, the top board being fastened over it in a manner which must have been almost identical with that adopted by the Chinook of the North West Pacific Coast. The result of this treatment was that the front and back of the head became flat and the general form resembled, according to the old ecclesiastic, an ill-shaped bishop's mitre instead of a human head.[21] Laureano de la Cruz, whose activities took place in the middle of the seventeenth century, describes also a somewhat different method, and states that a few days after birth a bandage of broad cotton is bound round the head of the child. On the forehead is secured a small board by means of strong bandages, and in this way, the writer remarks, the head becomes rounded, elongated upwards, flat in front and much disproportioned.[22] This account is of especial interest since it appears that the Omagua had two different forms of deformation, one, the simple fronto-occipital (boards) method and the other, the method of circular constriction (bandages) which they employed together with a frontal board secured by fresh bandages, a method which is rare and seems to be a confused combination of two methods.

Rodriguez, who published a book in 1684, apparently follows Acuña in his description of the cranial deformation,[23] whilst the Ouvidor F. X. Ribeiro de Sampaio, who visited Olivença in 1774 on an official tour, describes how formerly children used to have their heads compressed between two

[21] Acuña, 1, p. 24. Acuña, 2, p. 96.
[22] Cruz, p. 99.
[23] Rodriguez, Liv. II, Cap. X, p. 124.

boards, the effect of a bishop's mitre being produced. He himself compares these head forms to those of the Macrocephali mentioned by Hippocrates, but adds that at the time of his visit those natives whom he observed had abandoned the custom.[24] Four years after his tour La Condamine published his book in a new edition at Maestricht and, apparently making no change from the earlier edition, asserted that the Omagua squeezed the foreheads of their newborn children between two boards in order, according to their own account, to make them resemble full moons.[25] I am not aware that other authors have reported a similar statement and possibly the explanation may be found in the fact that breadth of face was merely what was admired. Cazal many years later says nothing of this theory although he mentions the custom,[26] and Spix and Martius in 1822 simply mention the canoe-shaped cradles in which children are placed and secured whilst their heads are compressed between boards to give them a mitre-shape[27] or, as Meyen expresses it, the form of a sugar-loaf.[28]

The same custom has been reported of the Conibo of the Pampa del Sacramento and the Ucayali river. Skinner in 1805 says of the Conibo what La Condamine had said of the Omagua, namely, that they flattened their foreheads and occiputs with the view of resembling the full moon and of becoming the strongest and most valiant people in the world. The forehead of the child, he says, is first of all wrapped in cotton, and then a small square board is laid on it, another being applied to the occiput and the two adjusted with cords.

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[24] Ribeiro, p. 72. Chantre y Herrera describes the effect as like that produced by a wig. See p. 64, and *cf.* Métraux, p. 197.

[25] See Veigl, p. 78. La Condamine, 2, p. 70: *cf.* La Condamine, 1, p. 36 and Diderot and Alembert, vol. IV (1754), p. 431 *b*. A diabolic origin has also been reported. See Jiménez de la Espada, p. 194.

[26] Cazal, vol. I, p. 326. [27] Spix and Martius, vol. III, p. 1187.

[28] Meyen, p. 35. Jorge Juan and Antonio de Ulloa describing the monstrous appearance of the Omagua head state that in proportion as the forehead is compressed it rises upwards to such a height that the space between the bridge of the nose and the beginning of the hair is greater than that between the bridge of the nose and the tip of the beard. They add that the practice is of some antiquity, nevertheless, they rigidly conform to it and deride other tribes amongst whom it is not met, calling them contemptuously "calabash heads" (see Juan y Santacilla and Ulloa, Liv. VI, Cap. V, vol. II, 919, pp. 533 *ff.*).

Skinner remarks that this practice cannot fail to alter the functions of the brain, and states that the reproach of stupidity has been levelled against certain Japanese priests whose heads are compressed into the form of sugar-loaves, a statement for which I have not seen any reliable evidence elsewhere.[29]

The Conibo constitute, together with the Sipibo and other tribes, the so-called Tschama peoples who have long been known to practise head deformation. Generally speaking it appears that the newborn infant is forced to wear the head-presser (*vuitá-nete*) continuously for three months, except when the child is being washed. They say that if the head is not treated thus it becomes ugly and thus care is taken to see that the head is properly flattened when the bones are still plastic.[30] Similarly Herndon reported upon the same custom amongst the Conibo in 1854, but states that the heads of adults showed no trace of deformation,[31] although seven years later Grandidier stated that they were still practising the custom.

After describing the apparatus he states that it is only removed when the child has attained the age of six months, and there would appear to be no doubt that the practice was carried out in some districts until recent times.[32] Thus in the Mission at Sarayaco, Raimondi had the opportunity of inspecting the case of a child who was undergoing the process about 1860. He says that the child had been brought to the Mission to be baptized, and had its head elongated behind, with a rounded projection on the frontal bone, the remainder of this region being much depressed apart from this protuberance. Upon being questioned, the mother replied that there was a hole of considerable size in the board, a statement which can be paralleled as we have previously seen in the case of the North American Indians.[33] Marcoy, however, in 1869 states that the Conibo had abandoned the practice, although traces could still be seen amongst the older people.[34] Fray Gabriel Sala on the other hand, gives a good description of the methods

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[29] Skinner, p. 269.

[30] See Tessmann, 1, pp. 211 *ff.* and *cf.* Abb. 5, p. 212 and Taf, 52-53.

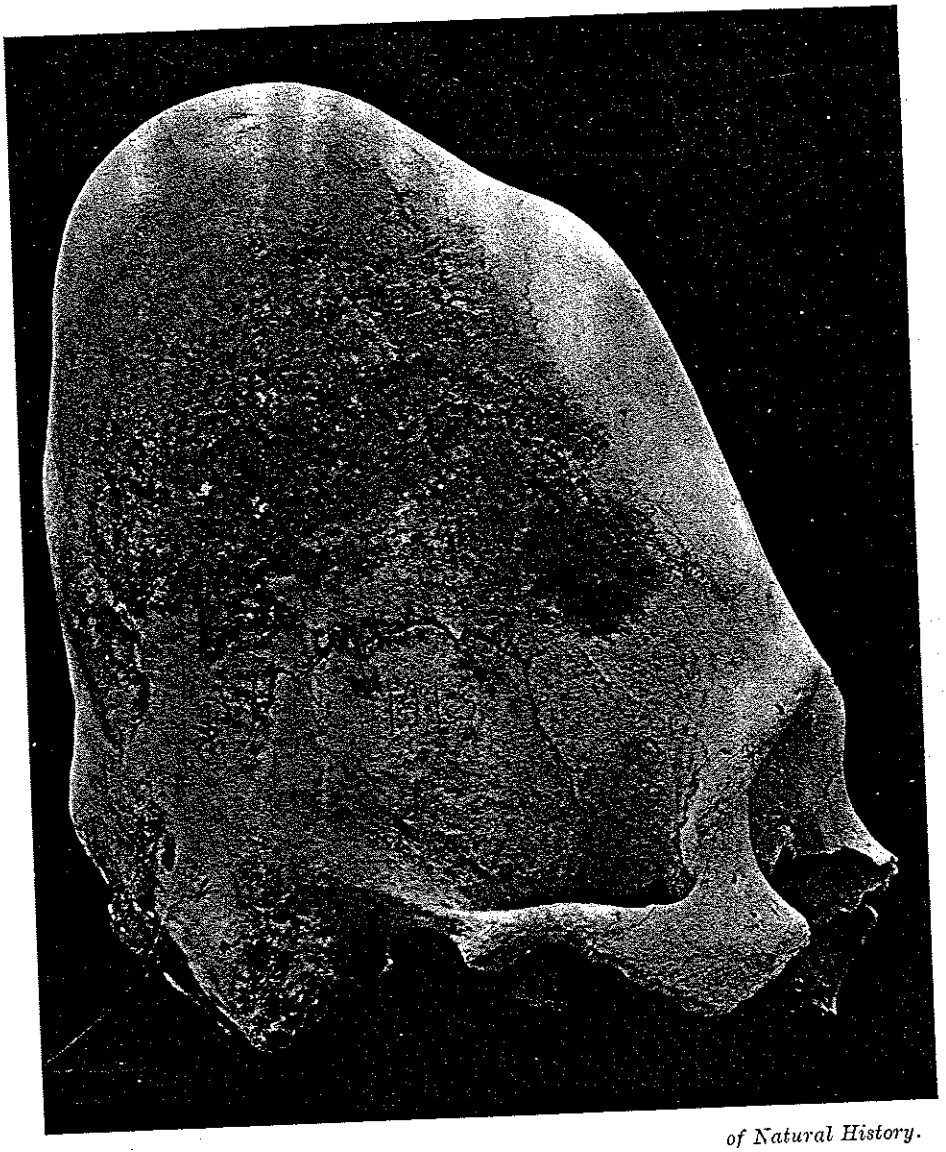
[31] Herndon, p. 203.

[32] Grandidier, E., pp. 128-129.

[33] Raimondi, p. 20. For the Sarayaco Mission see Smyth and Lowe, pp. 203 *ff.* and *cf.* Hutchinson, T. J., 2, vol. II, p. 83.

[34] Marcoy, 1, vol. I, p. 666 : Marcoy, 2, vol. II, p. 40 and *cf.* vol. I, pp. 67 ; 68 ; 476 ; 515.

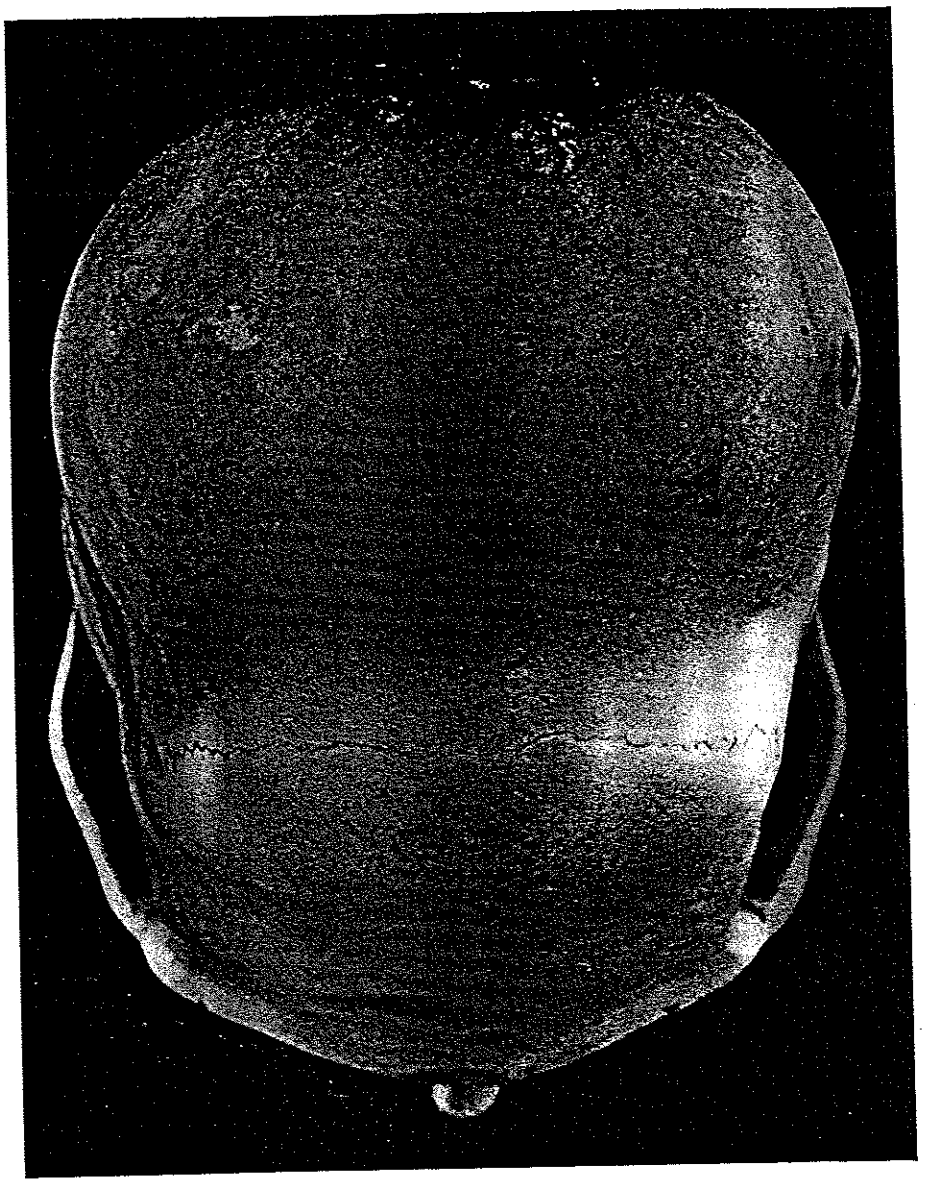
PLATE XLIV.



Field Museum *of Natural History.*

Deformed Peruvian Skull.

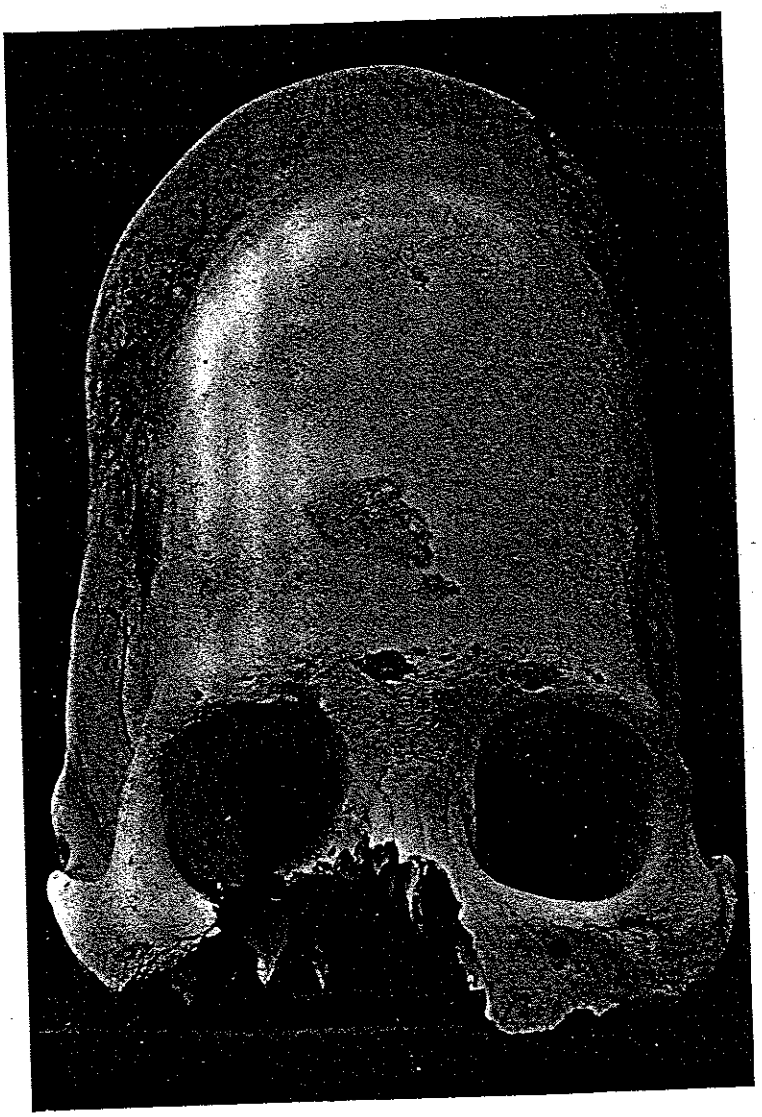
PLATE XLV.



Field Museum *of Natural History.*

Deformed Peruvian Skull.

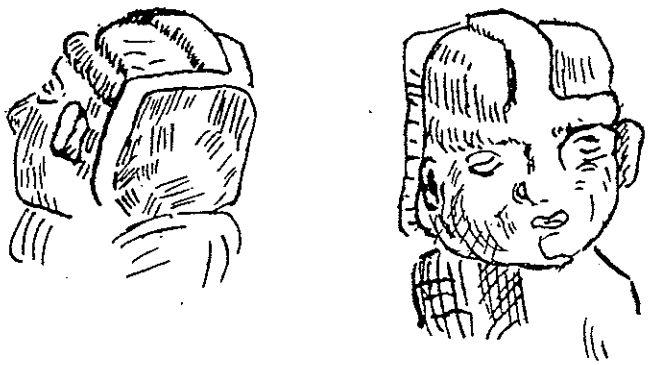
PLATE XLVI.



Field Museum *of Natural History.*

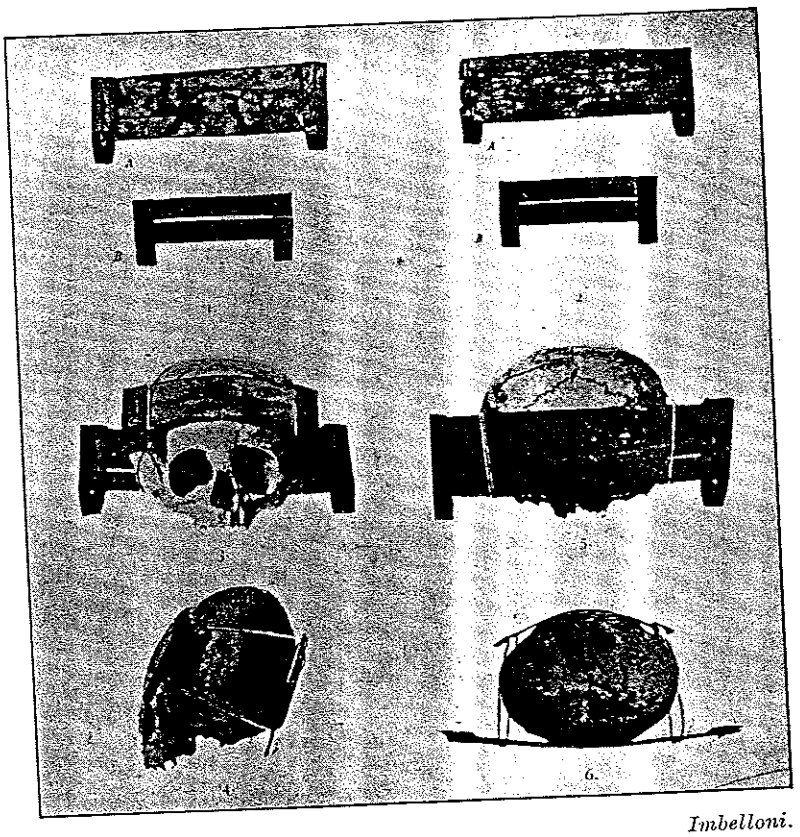
Deformed Peruvian Skull.

PLATE XLVII.



a

Peruvian Apparatus for Head Deformation. From a Vase. (After Cachot.)



After Imbelloni.

b

Apparatus for Head Deformation from Campo Morado.

which he himself had the opportunity of observing. The first part of the operation consisted in the construction of a sort of straw comb-like arrangement made out of a bunch of reeds and fastened with two lumps of metal. This device measured seven inches in length and two and a half inches broad. Under it was placed a small cotton pad or cushion shaped rather like a money roll, and this was fastened firmly behind the occiput by a bandage or thong. As the child was forced to become used to the device just after birth, the head was flattened without much suffering on its part, and the child developed a wedge-shaped head and remained thus deformed during the rest of its life. The reason, Sala adds, that this barbarity was practised on both sexes was that the people did not wish their hair to impede their vision and so they desired a high forehead, which feature was lacking in other tribes.[35] From this description it does not seem clear whether pads were used both in front and behind, but it is possible that the device at the back was fastened against the occiput by a bandage passing over the forehead. The explanation given by Sala must either be a misunderstanding on his part, or have been given by those who had little knowledge of the custom. With regard to the apparatus itself Church says that two boards were used and children who were still being suckled were to be seen wearing these attachments, the people thinking the result "very pretty."[36] Reich, on the other hand declares that a board and a pad are used, adding that the compression lasted eight days which probably means eight days at a time.[37] Farabee reports, if I understand him rightly, that the Conibo still practise cranial deformation.

Soon after birth, he says, the head of the infant is fitted with a board bound upon the forehead, and a pad of cotton upon the occiput, and these are left in place for five or six months.[38] A similar method is followed by the Sipibo, another tribe of the Ucayali, and the high C.I. found amongst them is probably due to the distortion arising from the board method of deformation (see Pl. XXXIX).[39] Similarly the Amahuaca, who live in the high country near the head waters of the Sepauha and Piedras rivers, artificially flatten the heads of their children by tying boards to their foreheads, and in

[35] Sala, p. 80. [36] Church, p. 185. [37] Reich, p. 134.
[38] Farabee, 3, p. 81. [39] Farabee, 3, pp. 96 *ff.*

addition they try to compress their noses by tying bands across them.[40]

A rather different result is achieved by the Macheyenga, a tribe related to the Campa who live along the middle course of the Urubamba river. Here heads are deformed by binding a board upon the occiput and a roll of cotton over the forehead, so that a groove is formed on the frontal bone, which, it is said, can be felt distinctly.[41]

Tessmann[42] has recently summarized the facts which relate to the practice of artificial cranial deformation among certain of the modern tribes, such as the Cashibo, Nokamán, &c. The Omagua are no longer addicted to the practice, and similarly the custom is not reported among the Kokama, Panobo, Ssensse, Koto, Pioché, Lamisto, Aguano, Kandoschi, Kichos, Bora, Ssabela, Uitoto, Muinane, Mayoruna, Tschamikuro, Chebero, &c. Amongst the Cashibo, who dwell between the Pachitea and the Cushabatay, the customs both of cranial deformation and of nose perforation have been reported. The head press is called *wuömídi*, and consists of a wooden tablet with woven band (*nyumbi*) which is secured upon the forehead of infants shortly after birth. Again the Nokamán (Pano), who are now settled near the source of the Inuya, a tributary of the lower Urubamba, use a piece of apparatus which they call *yewuitsígage*, and the Auischiri (Pano-Tukano) try to produce long heads by means of bandages, a custom also practised by the mixed Kahuarano. Similarly the Zaparo, who live north of the River Tigre, mould and press the heads of their infants to produce long faces, whereas the Ikito and the Pioché try to produce broad faces by the same means.

Again, further south some of the Guaycuru may have had the same custom at one time since Hutchinson describes some natives whom he thought to belong to this tribe as having an almost total absence of frontal development,[43] Mazzoleni stating that they have a ferocious, imposing and terrifying look.[44] Such customs are connected, as we have seen, with similar ideas as to the efficacy of moulding infants' heads by the hands in order to give them forms more in keeping with local ideas of beauty, and South America is no exception to

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[40] Farabee, 3, p. 107.
[41] Farabee, 3, p. 20.
[42] Tessmann, 2, pp. 50, 130, 173, &c.
[43] Hutchinson, 1, p. 24.
[44] Mazzoleni, p. 540.

the rule. For example, when a child was born at Ascension in north-east Bolivia, Nordenskiöld reports that it had an unnaturally long head.

The old woman who was assisting the mother during the confinement explained to her that this was of no consequence as the child's head could easily be made rounder,[45] and among certain of the tribes in south-east Paraguay much attention is paid to the infant's head. The child, when it is being washed, is thoroughly massaged with the finger tips, no part of the body being neglected. Each finger and toe is pulled and pressed and then the head is manipulated. Mayntzhusen reports that the majority of the children are born with very long heads, but he was not able to take any measurements in order to confirm this. This dolichocephaly is considered very ugly by the natives, and for this reason trouble is taken to make heads broader. This is carried out by means of a somewhat vigorous pressing of the head between the hands. Pressure is maintained by one hand on the back of the child's head and the other forced against the chin in the opposite direction, the under jaw being prevented from projecting through repeated pressure and the face being as it were, bent in at the root of the nose by this pressure and counter-pressure. Mayntzhusen did not notice that the children suffered under these manipulations which lasted until it was thought that the bones had hardened. The form of forehead resulting from the treatment is said to give those who have submitted to it a pleasing and intelligent expression, although the shortened nose is not beautiful according to Western standards.[46]

Passing northwards rapidly we find a possibility of the same customs of deformation in Marago Island on the southern banks of the Amazon and along the same shore as far as Obidos where figurines have been discovered with heads so formed as to suggest fronto-occipital deformation.[47]

We can now turn to inquire very briefly into the custom of cranial deformation as it was carried out in Ancient Peru.[48] The archæology of Peru is so complicated and so little known that I cannot attempt here any discussion of the evidence. The number of scientific excavations are so few, and our

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[45] Nordenskiöld, p. 153.
[46] Mayntzhusen, p. 409.
[47] Joyce, 1, pp. 261, 265; Netto, pp. 318, 319, 326 and *cf.* Est. XIII.
[48] See Pl. XL for a common type of the Highland variety.

general knowledge of archæological sites so imperfect that any theory as to the distribution of such practices as cranial deformation would seem to me to be hazardous. Hence I have essayed merely to select those portions of the evidence which seem to me to be relevant in the hope that future investigators will help to weave together the threads of our knowledge into a consistent fabric. Apart from Tello's theory as to a Highland origin of Peruvian culture[49] the excavations of Uhle[50] have shown broadly that the Coast periods can be arranged roughly into five groups: Pre-Tiahuanaco (Early Chimu and Early Nasca); Tiahuanaco; Post-Tiahuanaco; Pre-Inca and Inca. The Pachacamac coast culture contains elements combining at least four phases, namely Tiahuanaco, related Tiahuanaco, local or post-Tiahuanaco and late Inca, [51]Tiahuanaco culture of the Bolivian Highlands, 13,000 ft. above sea level and the Cuzco (Inca) centre may be taken as typical of the two periods of Highland culture.

In spite of the accounts of the early chroniclers the question of the reality of cranial deformation in South America was debated by scholars as late as the first quarter of the nineteenth century. It is true that Tiedemann noticed the peculiar confirmation of a Peruvian cranium found by G. J. R. Pentland, and published his remarks in 1833,[52] Morton in his *Crania Americana* published six years later, fully recognizing the fact of deformation.[53] Bellamy, however, in commenting upon the two Peruvian child mummies which were brought to England about 1840 and which were once in the Museum of the Devon and Cornwall Natural History Society, thought that artificial deformation was not responsible for the form of the skulls in spite of the flattened frontal regions and irregularly flattened occiputs; an opinion not shared by Owen who regarded their form as due to constriction by bandages.[54] Retzius[55] on the

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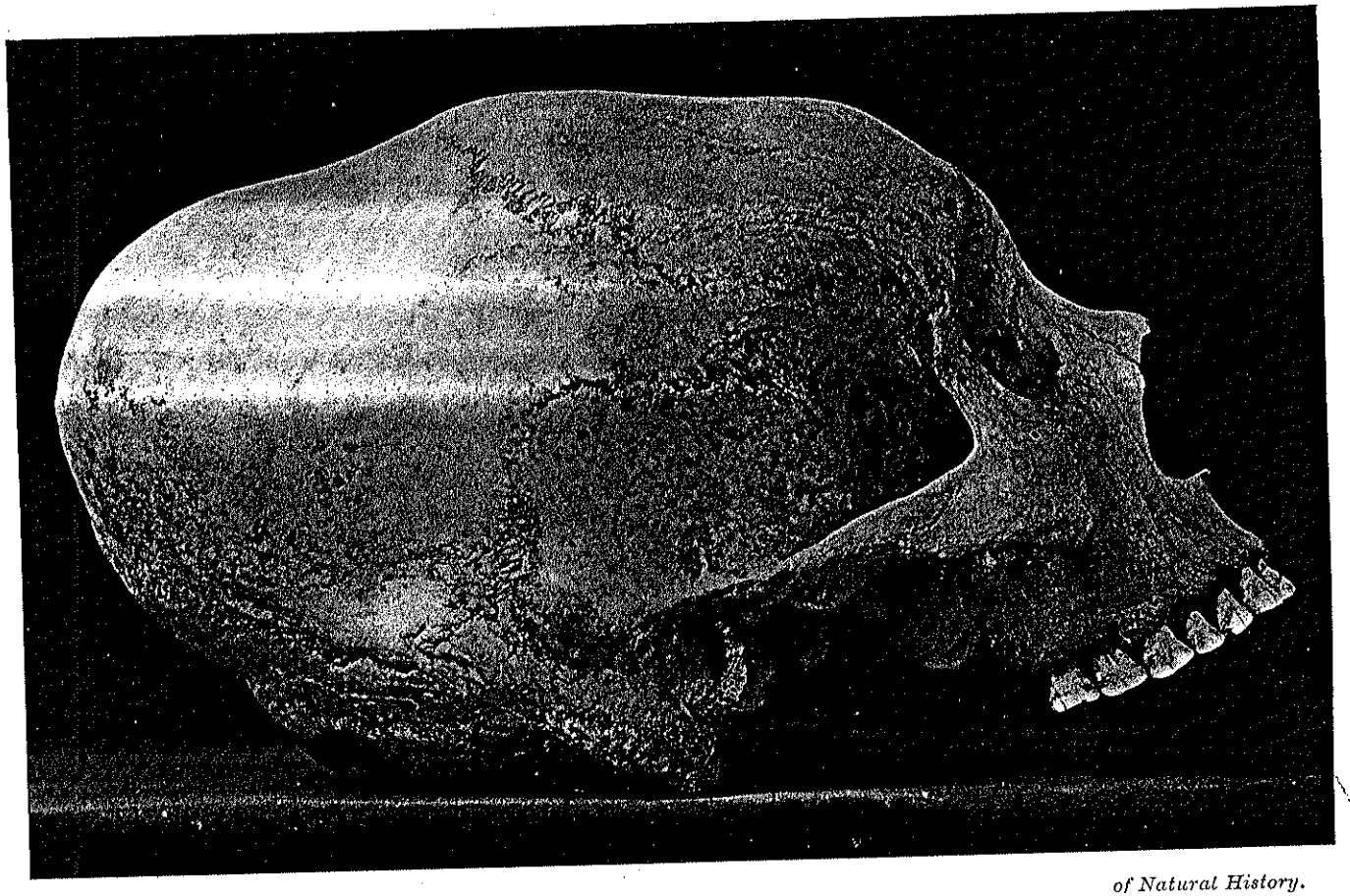
[49] Tello, 2. [50] Uhle, 2. [51] *Cf.* Uhle, 2; Kroeber, 3, pp. 625-626.

[52] Tiedemann. In 1874 some letters appeared in *Nature* concerning the so-called long Peruvian skull in which J. B. Davis and J. Wyman debated certain points regarding Peruvian artificial deformation with Daniel Wilson. See J. B. Davis, 6; Wilson, 3; and Wyman, J.

[53] Morton, 1. For a general discussion of normal and deformed skulls from Peru and Bolivia see Hoyos Sainz.

[54] Bellamy, p. 100. [55] Retzius, A., 1.



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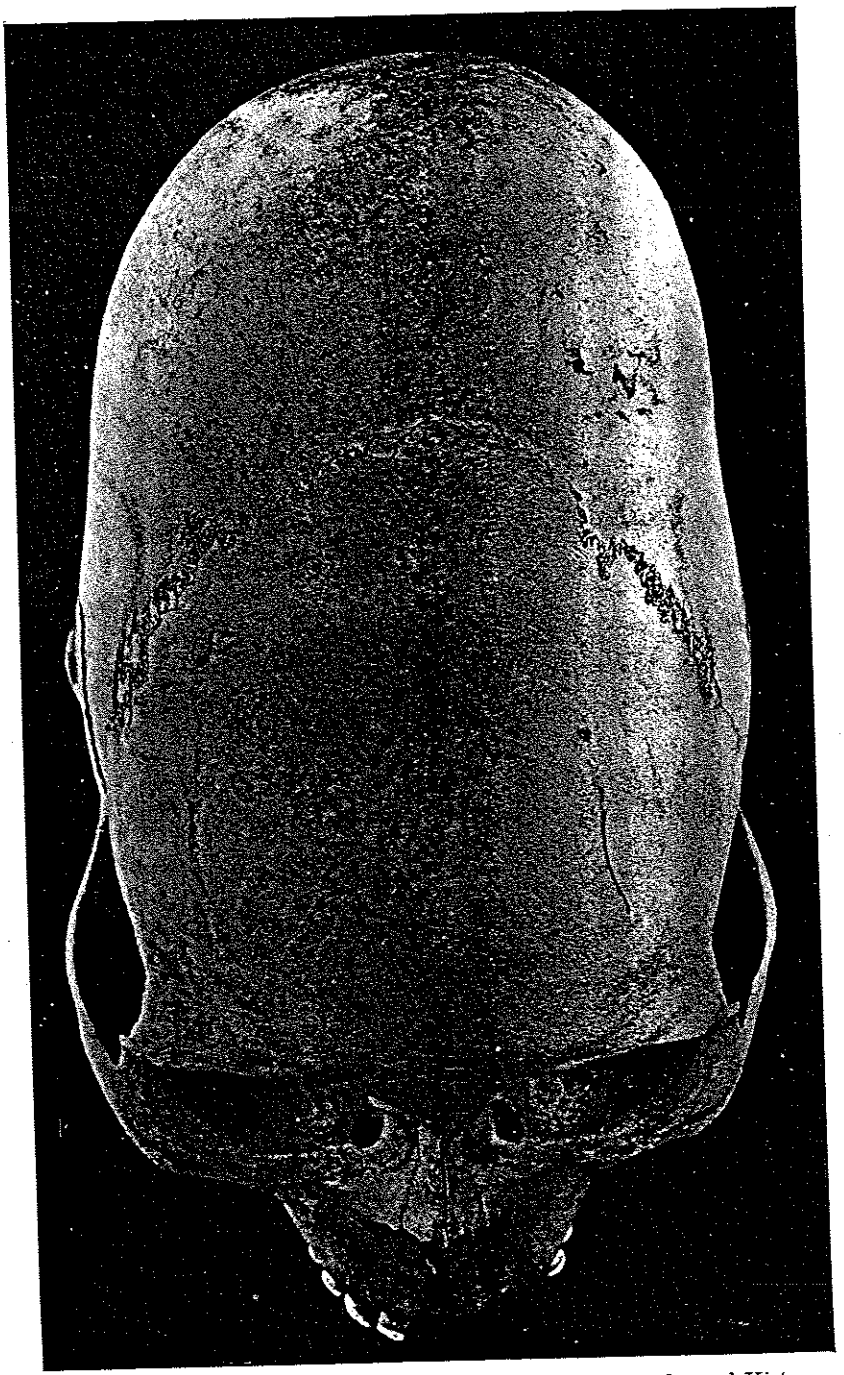
Deformed Peruvian Skull.

PLATE XLIX.



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Deformed Peruvian Skull.

other hand, who discussed Peruvian skulls in 1849, does not appear to stress the importance of the South American deformations which had already been recognized for over ten years and which Morton had divided into four types three years previously.[56] In 1853 Rivero and Tschudi issued their joint work on Peruvian antiquities and discussed the question of artificial deformation. The odd character of many of the Peruvian crania is admitted, but these authors believed it was an error to suppose that the cranial irregularities presented by the Peruvian material were exclusively artificial. A case is discussed where the mummy of a pregnant woman was found in a cave near Tarma. The head of the seven months' child was said to resemble certain of the deformed specimens, but Rivero and Tschudi do not produce any evidence showing that the skull was normal and not distorted through pathological or other causes.[57] Such a case cannot possibly lend support to the assumption that the distorted Peruvian crania are normal. Even if we had no evidence from historical sources such reports as these would be of no value in assisting to solve the problem. The idea of the Peruvian skull as being naturally "flat head" (*i.e.* with fronto-occipital flattening) was discussed in the report of the Council of the American Antiquarian Association in 1855, and mention was made of A. d'Orbigny's work where he showed that this deformation was a mark of distinction and the most ill-shaped heads were found in the largest and finest tombs, traces of bandages being clearly discernible.[58] D'Orbigny had shown as early as 1839 that in the same graves abnormally shaped crania were to be found side by side with normal, a fact which led him to suppose that the difference was due to "une opération mécanique."[59]

In 1863 C. C. Blake published a paper upon the cranial characters of the Peruvian races in which he discussed the crania from Titicaca (Highland) with their retreating foreheads and excessive elongation. Moreover he recognized the variety found on the coast with its increased brachycephaly, and he

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[56] Morton, 3, p. 17.

[57] Rivero and Tschudi, pp. 32-36: *cf.* Gosse, L. A., 2, p. 550; Uhle, 1, p. 408.

[58] See Report (The) of the Council, &c., p. 22; *cf.* Morton, 2, pp. 191, &c.

[59] D'Orbigny, 1, vol. IV, p. 144.

also mentioned the sugar-loaf form found at Atacama.[60] With the exception of a rather poor general summary by Bastian in 1878[61] the paper by Macedo[62] read before the second Pan-American Scientific Congress in Washington constitutes the only fairly full general account of the artificial deformation of the skull in Ancient Peru. It is not difficult to understand why the earlier inquirers failed to grasp the fact of Peruvian artificial deformation. The custom was so widespread, and the sites which attracted early attention provided such a mass of specimens, that the theory that such conformations were natural was easy of acceptance. Of 500 skulls in Paris, Quatrefages and Hamy report that 60 only are free from deformation[63] and a similar small percentage is to be found in the University Museum at Rome.[64] Mummies of children exhibit the same extraordinary forms, and Manouvrier, in 1889, had the curiosity to remove a portion of the scalp in order to observe the state of the sutures in the case of a mummy of a child of only a few months old,[65] whilst Tello, in 1918, discussed and illustrated a remarkable specimen of extreme ovoid form.[66]

We are now in a position to discuss more in detail the chief centres in Peru where deformation formerly flourished. We will begin with a consideration of the coastal area, where a peculiar form of deformation (see Pls. XLIV-XLVI) was prevalent and from where a considerable number of specimens have been obtained. The Inca Empire at its greatest expansion extended from about the river Ancas-mayu in the north, or

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[60] Blake, p. 219. The two types of Coast and Highland are now generally recognized: *cf.* Joyce, 1, Pl. X, p. 128; Vram, 2, p. 54. Bräss (p. 167), however, distinguishes three distinct types, which Blake had already suggested.

[61] Bastian, vol. I, p. 146.

[62] Macedo, 1: *cf.* summary under Macedo, 2, p. 869.

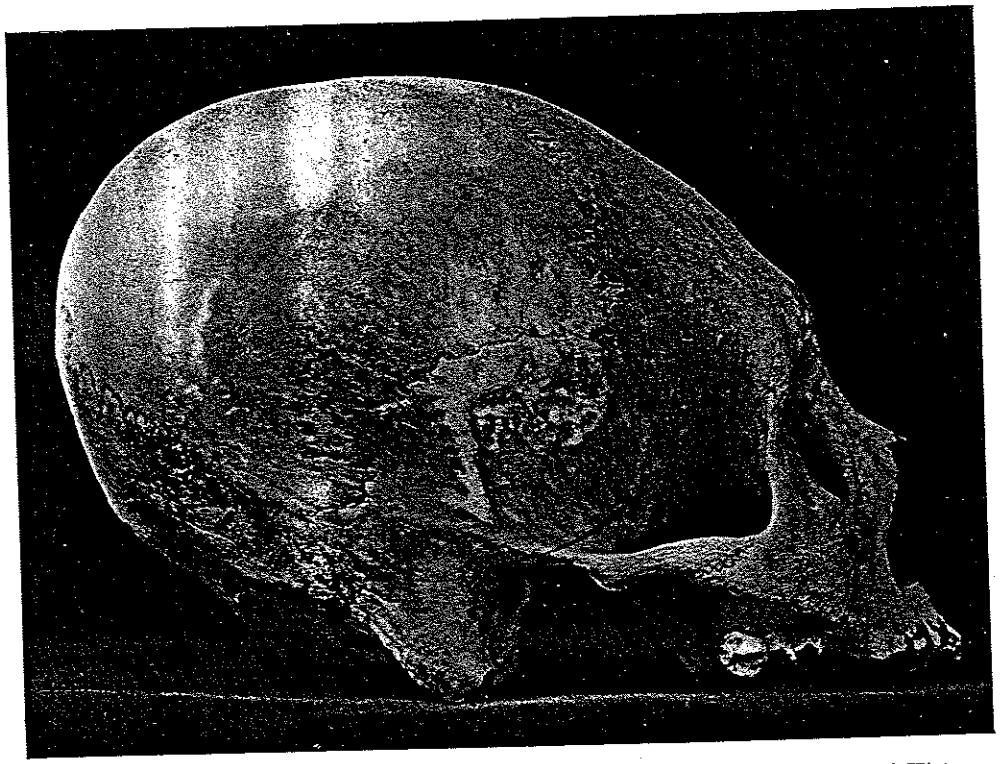
[63] Quatrefages and Hamy, vol. I (Text), p. 474.

[64] Sergi, G. and Moschen, L., p. 5. Again, Stolyhwo, in discussing 92 Peruvian skulls, found just over 6 per cent. normal specimens. In some sites practically all examples are found to be deformed indicating that the custom was widely distributed amongst the population. In 91 skulls he found 3·3 per cent. were trephined, but I do not think that there is any relation between the two practices. See Stolyhwo, pp. 110; 122 and *cf.* RMEA, 1906, pp. 442-443.

[65] Manouvrier, 1, pp. 567; 569.

[66] Tello, 1, *cf.* Est. VII; *cf.* also Pl. XLI showing an early specimen from D'Orbigny, and Pls. XLII and XLIII showing the beautiful specimen collected by Dr. Hrdlička near Arica.

PLATE L.



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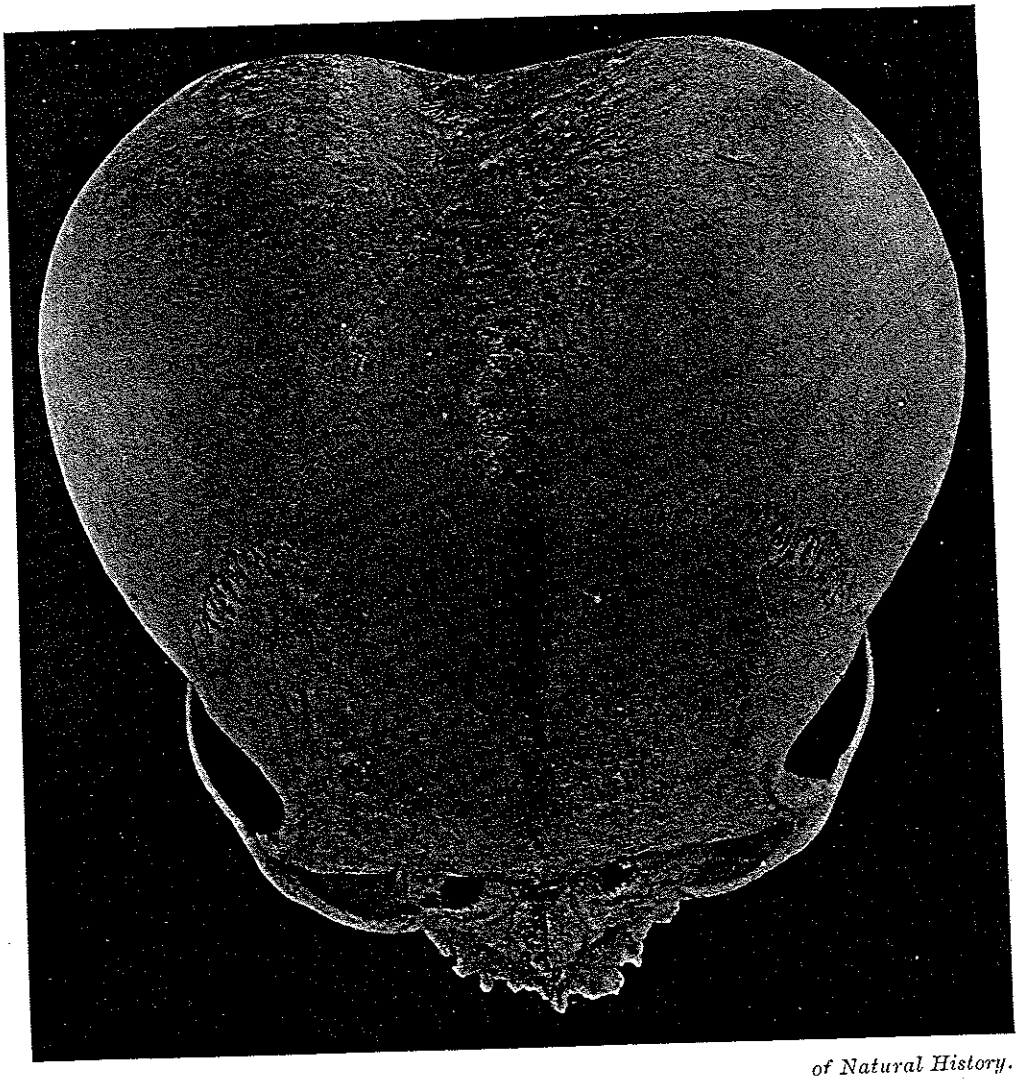
Deformed Peruvian "Bi-lobed" Skull.

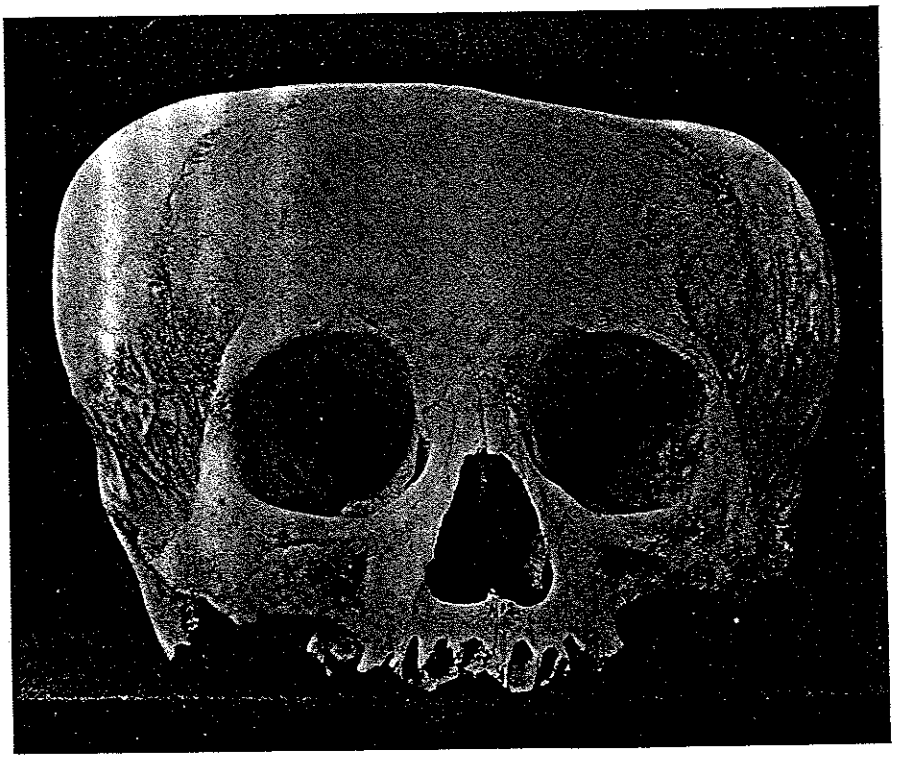
PLATE LI.



Field Museum *of Natural History.*

Deformed Peruvian "Bi-lobed" Skull.

PLATE LII.



Field Museum *of Natural History.*

Deformed Peruvian "Bi-lobed" Skull.

roughly at the frontiers of modern Ecuador and Peru, to the river Maule in the south near to the modern Constitución. We will begin with the more northerly sites and then work southwards touching upon some of the more important points on the coast as we proceed. The coastal peoples were largely brachycephalic although dolichocephals are found in some of the graves. In the earlier burials deformed crania are much less common and dental mutilations almost absent. In the later graves crania show marked occipital flattening (cradle-board ?) and also fronto-occipital deformation, this being the characteristic form of the coastal distortion. In the Truxillo district (Chimu coast) where brachycephaly predominates, both forms are found,[67] and further south in the Huacho valley a certain percentage showed little traces of deformation, whereas some had pronounced fronto-occipital flattening and at least seven crania exhibited the Highland or Aymara type, thus suggesting influence from the mountains.

At the great necropolis at Ancon, which is of various dates, the earliest burials present the best examples of deformation. In the more recent graves, deformation is either absent or is only represented by slight fronto-occipital flattening.[68] Even where the marks of clear intentional deformation are absent the Ancon specimens show slight modifications from the normal[69] which may be due to the influence of the cradle-board,[70] and when plagiocephaly is present it is usually on the left side.[71] Among these deformed skulls pathological and other changes are common. Wormian bones are frequently observed, and when found are often of an intricate and complicated character. Exostoses, mainly of the external auditory meatus have also been remarked, and this feature has led some authorities to regard such bony excrescences as due to the distortion, although Dorsey points out that among two undeformed specimens from Ancon which came under his own observation, both showed such osseous growths.[72] In a collection of crania brought from Ancon by

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[67] Hrdlička, 9, p. 6: Hrdlička, 10, p. 18.

[68] Hrdlička, 10, p. 14: Dorsey, 1, p. 358. Some are so much flattened that the C.I. has risen to over 103: see Topinard, 1.

[69] Reiss and Stübel, vol. III, pp. 131 *ff.*: *cf.* Pls. 108-116.

[70] *Loc. cit.*

[71] Ranke, 2, p. 724.

[72] Dorsey, 1, p. 358. *Cf.* Regalia: Virchow, 21: Sergi, S., 3.

Agassiz towards 1870, eight crania showed similar exostoses of various sizes, some very small but others almost completely filling the meatus.[73] Schreiber noticed the same point regarding skulls from this site[74] and in this connection it is interesting to note that MacCurdy, when examining skulls from the Highlands, found little evidence of abnormal changes in the external auditory meatus, although among the deformed skulls from Oregon, which were deformed like those from Ancon, the size of the meatus was reduced and in some cases almost closed.[75]

At Pachacamac, again, eighteen miles south of Lima, where two most important pre-Columbian Peruvian temples were found,[76] the crania are largely brachycephalic and present no examples of the Highland type of deformation. The distortion is again typical of the Coast being simple occipital or fronto-occipital or marked frontal and moderate occipital flattening, although some are found to be apparently free from deformation especially those which may be thought to have come from the more mountainous region.[77] At Chilca, about 70 miles south-east of Lima, in a cemetery of which the age is uncertain, those graves, which seem the earlier, contain undeformed crania, whilst others showed the usual fronto-occipital flattening. In the Nasca valley, where archæological finds are of the first importance, but which unfortunately do not appear to have been fully correlated with the somatological material, the brachycephalic Coast type is again prevalent, deformation not being extremely common, and when present of the fronto-occipital type. Hrdlička, during his investigations, found no specimen of the Highland variety, although these have been reported at no great distance.[78] At S. Lucia, north-east of the Acari river, the Highland type is found together with the coastal variety, suggesting intrusion from the east,[79] while at Lomas,[80] some 85 miles south-west of Nasca, a small proportion only exhibited deformation and no Highland types were found. From Chaviña extreme forms of fronto-

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[73] See Crania, pp. 8 *ff.* [74] Schreiber. [75] MacCurdy, 3, p. 231.
[76] Uhle, 2. [77] Hrdlička, 10, p. 21: Hrdlička, 9, p. 3: McVicar, p. 56.
[78] Hrdlička, 10, p. 42.
[79] Hrdlička, 10, pp. 33-37: *cf.* also the finds at Machu Picchu (see Eaton, pp. 82-83).
[80] Hrdlička, 10, pp. 24-25.

occipital compression have been recovered, and similar examples have been discovered in the valley of the Rio Grande de Nasca and elsewhere.[81] Another example of apparent intrusion from the mountains is found at Huarato, about three miles from Otopara, where all the crania found by Hrdlička exhibited the Highland type of deformation,[82] a fact which shows that intercourse between the two cultures was probably present, a supposition supported by the evidence of the pottery styles.

When we consider the custom of cranial deformation in the southern provinces of the Ancient Peruvian Empire (and it will be convenient to discuss this before examining the practice in the highlands) the same phenomenon we have previously observed in other parts of the world immediately becomes apparent. The practice begins to fade away as we travel in a southerly direction, and towards the extremity of the continent it disappears altogether. As far as Copiapo, south of which the influence of Araucanian speaking peoples may be said to begin, the country was, apart from the Atacama culture in the Punas of Jujuy and Atacama, mainly dominated by the Calchaqui culture, although traces of a ruder civilization are still discernible on the coast and in the highlands. Inca influence extended at least as far as the Maule and the fact that artificially deformed skulls are found throughout this area is what we should expect. Thus in the province of Tarapaca, the Charca, if we can judge from the burials, practised the Highland or Aymara form of deformation.[83] Among the Atacama, whose dead were buried in a squatting and contracted position, both brachycephaly and dolichocephaly have been found. Frontal, fronto-occipital, and even deformations due to circular bandages have here been discovered; and in the neighbourhood of the Quebrada del Toro, where urn burials are found and where Diaguite influence can be observed, the deformations are often particularly well marked.[84] At the Quebrada de Humahuaca (Jujuy) during excavations in 1918 a child's grave was discovered 200 metres to the south of the hill of Campo Morado. Above it was a circle of stones, and at a depth of 60 cm. the funerary objects were found. The

[81] Hrdlička, 10, p. 26.

[82] Hrdlička, 10, pp. 32-33.

[83] Joyce, 1, p. 219: *cf.* Virchow, 24.

[84] See Schörtter: Créqui-Montfort, p. 561: Boman, vol. I, pp. 151 *ff.*: Latcham, pp. 306; 308, &c.: Montell.

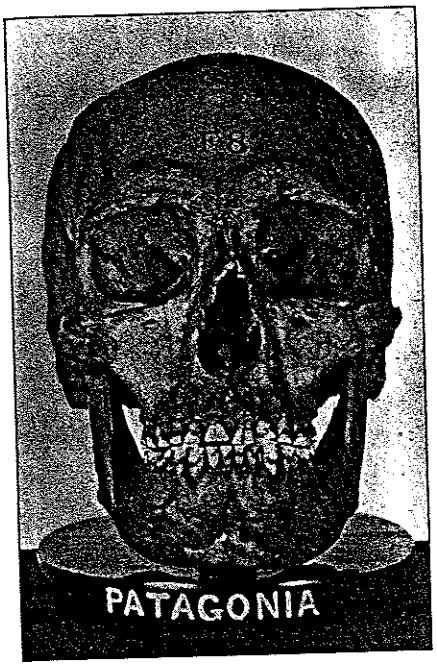
grave goods were unfortunately in great disorder and the skeleton itself too fragmentary to preserve intact. Among the finds were some fragments of tissue, half a calabash and a piece of horn, but the most important find was the apparatus used for deforming the child's skull. Unfortunately the attachments for tying the two sections together were missing but it is clear how the apparatus was employed. Pieces of hairy scalp and wisps of hair were adhering to each piece of wood. The age of the child is uncertain, the full set of milk teeth being present. It was not found possible to remove the skull intact, and Imbelloni's reproduction of the apparatus in position was made up by means of a museum specimen of an infant's skull of three or four years coming from the same valley and the same cemetery. The apparatus consists of two parts, or rather two little boards made of very hard wood which is probably carob. These strips are both thin and flexible and eminently adapted for their purpose. The piece destined to compress the frontal bone is composed of two strips of wood, one beneath the other with a slight space between each and joined at either end by two shorter pieces. The thickness of these two vertical strips does not exceed 1·5 mm. whilst the horizontal strips scarcely attain a thickness of 1 mm. The measurements of the frontal piece are as follows:—

	Length	Breadth
Upper horizontal strip ...	151 mm. ...	19 mm.
Lower ,, ,, ...	150 mm. ...	20 mm.
Vertical strip, 1	62 mm. ...	19·5-18 mm.
,, ,, 2	61 mm. ...	18-17 mm.

The second piece, adapted for occipital compression is composed of three horizontal strips which are longer than the frontal pieces, the vertical strips being both longer and broader. The strips of wood are also thicker, the horizontal pieces measuring 2-2·5 mm. and the vertical pieces from 2 to 3 mm. The measurements of the occipital pieces are as follows:—

	Length	Breadth
Upper horizontal strip ...	227 mm. ...	23 mm.
Centre ,, ,, ...	222 mm. ...	22 mm.
Lower ,, ,, ...	224 mm. ...	22 mm.
Vertical strip, 1	86 mm. ...	24-16 mm.
,, ,, 2	84 mm. ...	24-19 mm.

The apparatus was fastened together by means of a little cord which passed through several holes pierced both in the



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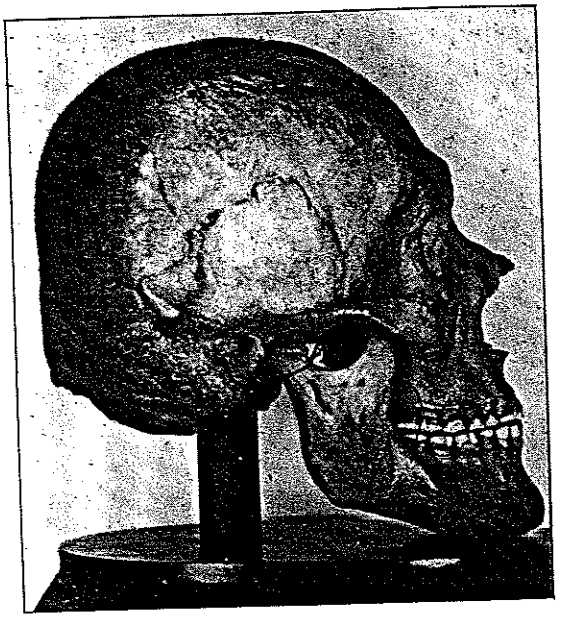
a

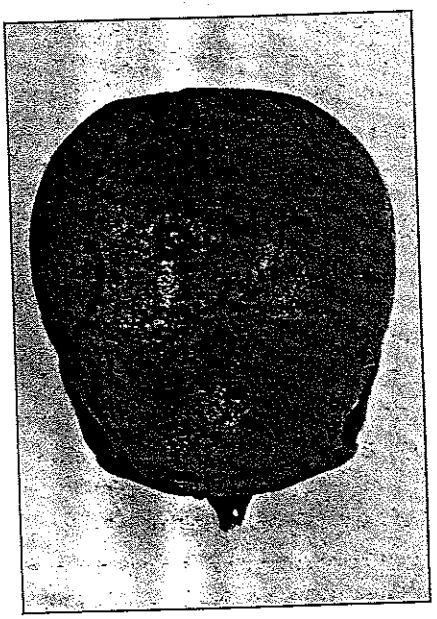
Deformed Patagonian Skull.



Univ. Coll., *London.*

b

Deformed Patagonian Skull.



Univ. Coll., *London.*

c

Deformed Patagonian Skull.

vertical and horizontal strips. A bit of this cord remained and it consisted of what is probably the wool of the llama, being one millimetre thick. The holes are well drilled and are regular in form, some suggesting that the point of a knife has been used to which a rotatory action was given. In the frontal piece there are eight holes on each side so arranged as to form two little squares; whilst on the occipital piece there are also eight holes on each side but arranged approximately in two vertical lines. The photograph of the apparatus (see Pl. XLVII, *b*) clearly shows its method of application, and gives a vivid picture of how fronto-occipital deformation was effected.[85] During the Swedish Chaco-Cordillera Expedition of 1901 to 1902 a number of cases of skulls showing extreme forms of deformation were observed[86] although asymmetry was often apparent. Some were found in the neighbourhood of Casabindo of which Pl. LIV, *b*, gives a specimen. The Calchaqui culture seems to have extended over a wide area comprising the more southern portions of Jujuy, Salta, Catamarca, Western Tucuman, Rioja and San Juan.[87] Peruvian influence cannot be doubted in this area. It is true that the methods of burial are varied, but certain of the grave goods indicate clearly a connexion with the Empire to the north. Thus in certain of the graves gold and silver strips are found bound round the deformed crania, one specimen found in the province of Jujuy being 48 cm. long and 2 cm. broad. Similar examples are found in Peru, and Silva reports that a silver specimen, 35 cm. long and 3·3 cm. broad was found in a certain burial ground near Lima.[88] In his excellent summary of the anthropology of the Diaguite region, ten Kate reports that amongst the adult crania 60 per cent. exhibit artificial deformation, which here is extremely varied,[89] although an increased brachycephaly nearly always results, cephalic indices of over 100 being registered. The commonest form is undoubtedly flattening by boards or pads in front and behind, but children's skulls often exhibit an extreme occipital flattening due doubtless to the cradle-board

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[85] Imbelloni, 2, pp. 607 *ff.*: Debenedetti gives some account of the excavations at Campo Morado.

[86] Rosen, pp. 2, &c. [87] Joyce, 1, p. 224. [88] Silva, pp. 306-307.

[89] *Cf.* Moreno, 3, p. 577 and Vram, 3, p. 209, who states that three main forms can be clearly distinguished.

and suggesting that infants were bound down when lying on the back. It would seem possible that deformation of the frontal region was effected when the child was lying in its cradle so that the occipital flattening may not have been intentional and therefore only of secondary importance.[90] Although amongst the Calchaqui a mixture of cranial types can be discerned (dolichocephaly is not unknown),[91] there can be no doubt that the prevailing type is brachycephalic. Basing her views on the condition of the parietal bones Dillenius towards 1910 propounded the theory that the Calchaqui skull is mainly dolichocephalic, fronto-occipital deformation being responsible for the brachycephaly. She compared the parietal bone of a skull deformed in the fronto-occipital style with those of normal brachycephalic and dolichocephalic skulls, and came to the conclusion that, when considered point by point, in spite of the brachycephalic nature of the deformed parietal, it had more features in common with the normal dolichocephalic. She discusses in detail the reduction of the sagittal and lambdoid sutures together with the corresponding transverse extension of the parietal, pointing out that the sagittal angle although smaller has preserved its dolichocephalic characteristics.[92] With regard to the theory of Dillenius it does not seem probable that ultra-brachycephalic skulls can be produced from an original dolichocephaly by antero-posterior pressure in infancy. It would, I think, seem more probable that mixture has affected the Calchaqui skull to the extent that mesaticephaly may perhaps be the normal condition of the original skull before deformation. This being so, the conversion to brachycephaly would not be difficult to imagine and certainly is more probable than a change from an original dolichocephaly to an ultra-brachycephaly.

Even in modern times fronto-occipital deformation is still practised in parts of the Calchaqui district, and Outes remarks upon an excellent example which he secured in Quilmes (Tucuman), and which exhibits in the living the appearance of the ancient inhabitants of this region.[93]

The next form of deformation to be considered is the High-

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[90] Kate, 1, pp. 31 *ff.*

[91] Kunike, 1, p. 217.

[92] See Dillenius, 3, especially pp. 138 *ff.* and *cf.* Dillenius, 1 and 2.

[93] Outes and Bruch, pp. 51, &c.

land or Aymara type (see Pls. XLVIII and XLIX and *cf.* the amazing "bi-lobed" specimen in Pls. L-LII). This is produced by the application of bandages to the skull and has been called in consequence circumferential or circular type. The most usual method was probably to surround the head with a circular bandage which passed over the frontal bone, across the lower parietal region and behind the occiput where it was secured. The chief result of this constriction was naturally a flattening of the frontal and occipital bones and consequent diminution of the fronto-occipital diameter. Convexity of the parietals is usually increased and a depression is often noticeable anterior to the coronal suture, whilst another appears behind bregma and a third upon the occipital bone indicating the passage of the bandage or bandages. The frontal bone is pushed back causing the coronal and lambdoid sutures to become more oblique, and the general effect is very similar to the macrocephalic specimens we have already discussed as occurring in the Crimea, Congo, New Hebrides and Vancouver Island.[94]

In 1878 Paul Broca discussed the deformed skulls from Tiahuanaco, remarking upon their elongated appearance[95] and since then a number of authorities have discussed the site, some of them noting the deformed crania which were discovered.[96] In discussing the human skeletal remains and especially the skulls of mixed cephalic indices found in the highlands north west of Cuzco, MacCurdy in 1923 stated that of 341 crania 147 had the so-called Highland deformation, females predominating. 133 male skulls gave 43 per cent. as deformed and of 107 female skulls 60 per cent. Certain of the female crania exhibited excessive forms of bandage constriction and in these distorted specimens the foramen magnum seemed smaller than in the undeformed. In the deformed series the average length of the foramen magnum was 3·3 cm. and the average breadth 2·9 cm. The average cranial capacity of the deformed group was 1213 c.c. and the undeformed 1288 c.c. thus suggesting that this form of deformation has some

[94] See Posnansky, 3, pp. 163 *ff.*: Malý, 1, p. 334. A doll found in a child's grave, and now in the Pitt Rivers Museum, Oxford, shows an extreme form of elongated head which well illustrates the ideal.

[95] Broca, 8, p. 230.

[96] *Cf.* Stübel & Uhle: Posnansky, 1 and 2, especially figs. 49-50, and Romero.

influence on cranial capacity. As regards osseous growths no apparent effect was observable in this series upon the external auditory meatus.[97] It is probable that the practice of deformation is dying out to-day throughout the whole of this area. Chervin [98] stated in 1912 that in the Bolivian highlands the custom was no longer found, but Bandelier reported two years earlier that certain of the Indians on Lake Titicaca were still practising the artificial elongation of the head,[99] and doubtless in isolated districts the custom persisted for a longer period than in those regions which were more exposed to the influences of civilization.

We are now in a position to review very briefly the historical evidence we possess, concerning the practice of cranial deformation in the Empire of the Inca both before and after the Spanish invasion. The Inca Garcilasso, whose mother was of Peruvian royal blood, when describing the method of fronto-occipital compression, states that as soon as the children were born their heads were deformed by placing a board upon the forehead and another against the occiput. These are tightened daily until the child is four or five years old with the object of making the head broad from one side to the other and narrow from the forehead to the occiput. Not content with the breadth thus produced they shear off the hair from the crown, top and back of the head leaving it growing at the sides; and these locks were neither combed nor neatly dressed but were curled and frizzed in order to increase their monstrous appearance.[100] Father Bernabe Cobo also in his *Historia del Nuevo Mundo* says that the Colla (Aymara) were accustomed to mould the heads of their children into different shapes with many superstitions and with so much vigour that he knew of one child who died from the pain caused by the operation and doubtless there were others also who suffered a similar fate.[101] Again López de Gómara, who wrote from hearsay, for he was never in the country, states, in describing the dress of some of the people, that they have broad and pointed heads,[102] a feature which we know was often accentuated by the wearing of tall pointed hats.

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[97] MacCurdy, 3, pp. 230 *ff.* [98] Chervin, p. 72. [99] Bandelier, p. 67.
[100] Garcilasso de la Vega, Lib. IX, Cap. VIII, pp. 233-234.
[101] Cobo, vol. IV, pp. 175 *ff.*
[102] López de Gómara, 1552 ed., Fo. LXVIII, 1922 ed., vol. II, p. 37.

The fact that the Spanish authorities had often attempted to suppress the practice was pointed out by Forbes[103] in 1870 and also by Topinard[104] in 1886. Charencey[105] briefly discussed the same question in his pamphlet published in Amiens in 1894, but as his account is incomplete and as, apparently, the dates have been confused by the other authorities, it may be of interest if we look over some of the more important documents in the order in which they were issued. One of the earliest, if not the earliest, of the decrees was that issued by the Provincial Court at Lima in 1567. In that year a Resolution[106] was adopted which was concerned with the practice of head deformation by the natives. It condemned the superstition which underlay the practice of moulding the heads of children into certain shapes which are called *çaytu* heads and *palta* heads by the Indians. The word *palta* means flattened and for *çayttu* Torres Rubio gives *Cosa larga y angosta*[107] and so probably these two terms are meant to describe the deformation by boards and that by bandages. The next important ordinance was that of November 6, 1573, made by the Viceroy D. Francisco de Toledo and was one of a set framed between 1572 and 1575.[108] This forbids any Indian man or woman to compress the heads of newborn children as they are wont to do in order to make them broad, because from having done such

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[103] Forbes, D., p. 205, who gives the incorrect date.

[104] Topinard, 5, in BSAP, 1886, 3e Sér., IX, p. 122.

[105] Charencey.

[106] Que la supersticion de amoldar la cabeças de los mochachos de ciertas formas que los Indios llaman çaytu uma, o palta uma del todo se quiten. Y a los Sacerdotes se manda que traba jen en corregir semejante abuso, tã pernicioso y a los juezes seglares se encarga; y pide que hagan exemplar castigo en los hechizeros que tel hazen. (See Lima, *Sumario*, &c., Pt. 2, 101, p. 64.)

[107] Torres Rubio, p. 156: *cf.* Baumgarten, Pt. II, p. 329 and *Enciclopedia Universal*, &c., Tom. XVII, p. 1318. *Cf.* Bertonio, 2, who in his Aymara glossary published in Chucuito in 1612 gives "sayttu" for "*cabeça ahusada*" and the same word for "*cosa ahusada mas que lo ordinario*" (Pt. I, p. 314).

[108] The ordinance reads thus:—"Iten, mando, que ningun Indio, ni India apriete las cabezas de las criaturas recien nacidas, como le suelen hazar para hazerlas mas largas, porque de averlo hecho se lesà recrecido y recrece daño, y vienen amorir dello; y desto tengan gran cuyado las Justicias Sacerdotes, y Alcades y Caziques en que no le haga" (see *Ordenanzas*. Tomo primero, &c., Lib. II., tit. IX, ord. VIII, p. 146).

things harm has accrued and is accruing, death even sometimes resulting; and the authorities are bidden to take care to prevent such proceedings. The next notice was that issued by the Third Diocesan Synod at the sitting of July 17, 1585.[109] In this document which set out with the earnest and pious wish that both abuses and superstitions shall be extirpated, the fact of the Indians compressing the heads of their children is again insisted upon, and also the fact that the hair of some of the natives was arranged in different styles, various unguents being also used as depilatories. Punishment varied according as to whether the sinner was of high rank or was merely a commoner, whilst women had special scales of milder punishments all to themselves. As a last resort the individual who remained obstinate in his sin in spite of the commands of Holy Church was referred to a higher authority, although with what result we do not know. Again in one of the topographical reports which were drawn up by certain of the local officials and which were issued between 1570 and 1590 occurs a statement[110] by the Corregidor of the department of the Collaguas

[109] This document reads thus:—"Cupientes penitus exstirpare abusum, et superstitionem, quibus Indi passim infantium capita formis imprimunt, quos ipsi vocant *caito, oma, opalta*, et certos modos componendi crines, eosque ex una in alteram formam abradendi, seu unctionibus evellendi, quae sunt superstitiones dignae remedio proinde statuimus, et praecipimus, quod Indus, qui talia fecerit, si fuerit saprapa, vulgo *caicque*, seu primarius, pro prima vice serviat per decem dies Ecclesiae suo Oppido viciniori; pro secunda per viginti; et pro tertia vice, instituatur informatio, et remittatur ad Vicarium Provinciae. Quod si plebejus fuerit, pro prima vice sustinebit plagas viginti, pro secunda duplicatas, et pro tertia fiat informatio, et remittatur eidem Vicario. Et si fuerit mulier frequentabit doctrinam per continuos decem dies mane. et vesperi pro prima culpa, pro secunda vero per viginti, et pro tertia fiat informatio, et remittatur, ut dictum est." (See Saenz de Aguirre, *Collectio Maxima Conciliorum*, &c., Cap. LXXIV, vol. VI, p. 204 and *cf. Lima limata*, &c., Cap. LXXIV, p. 246. *Cf.* also Blasio quoted by R. Virchow in VBG, 1901, p. 408.)

[110] The statement reads:—"Estos *Collaguas*, antes de la visita general que se hizo por mandado del excelentísimo virrey don Francisco de Toledo, traian en la cabeza unos que llamaban en su lengua *chucos*, á manera de sombreros muy altos sin falda ninguna, y para que se pudiesen tener en la cabeza, se la apretaban á los niños recien nacidos tan reciamente, que se la ahusaban y adelgazaban alta y prolongada lo más que podían, para memoria que habian las cabezas de tener la forma alta del volcan de donde salieron. Esto les está y prohebido por ordenanza." (See *Relación de la Provincia de los Collaguas*, &c. in *Rel. geog. de Indias*, &c. vol. II (1885), p. 40.)

(Arequipa), Joan de Ulloa Mogollon, who, writing apparently in January 1586, mentions the very high brimless hats worn by the people and also the custom they had of compressing the heads of newborn children by means of tight fitting caps in order to make them tapering, narrow, high and elongated, a custom, which, he says, is due to the fact that they wish them to resemble the volcano from which tradition said that they sprang. Of the Quichua Indians he declares that their form of deformation differs from the preceding, inasmuch as they prefer heads to be flat and broad, a shape they bring about by means of encircling bandages,[111] a statement not easy to understand.

From these reports it will be remarked that the Quichua are said to practise a form of deformation producing broad, flat heads, and the Collagua another form which resulted in elongation.

The story by Salcamayhua that Manco Ccapac, one of the Children of the Sun, first ordered the heads of newborn children to be compressed is curious. Salcamayhua was a pure-blooded Indian and his works give us a mass of Inca traditions which were handed down from generation to generation. The reason given according to the story, is that the Inca wished heads to be deformed in order that those that submitted to it might be weak and without energy. This explanation does not sound convincing and suggests that tradition held that the custom was first imposed upon either rebellious subjects or those who might become troublesome. This latter explanation is perhaps suggested by Salcamayhua's further statement that Lloque Yupanqui Inca continued the practice and ordered his people to flatten the heads of their children so that their foreheads might be retreating in order that they might, through this process, be made obedient.[112] Similarly the Franciscan Torquemada

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[111] "Estos son muy diferentes en la cabeza á los *Collaguas*, porque, recien nacidos los niños é niñas, se le atan muy recio y la hacen chata y ancha, muy fea y desproporcionada; la cual se atan con unas cuerdas blancas á manera de mechas, y dando muchas vueltas alrededor, quedan las cabezas ensanchadas. Estáles prohibido ya esto por ordenanza. Conócense bien en la hechura de las cabezas el ques natural de *Cavana* y el ques *Collagua*, que, como está dicho, los *Collaguas* se ahusan la cabeza larga y estos *Cavanas* ancha y chata." (*Op. cit.*, p. 41.)

[112] See Santa Cruz Pachacuti Yamqui Salcamayhua, pp. 246; 253.

in his *Monarquia Indiana* describes the various forms of head deformation both in Mexico and Peru, and states that certain Peruvian nobles granted some of their lords permission to shape the heads of their children in the same way as those of themselves and their families, which suggests that at one time at least the custom was a privilege of the Peruvian aristocracy, a supposition still further supported by the fact of the gold and silver fillets which we have seen have been discovered encircling certain of the deformed crania.[113]

From the above remarks the reader will, I hope, obtain a fairly clear idea of the custom of artificial cranial deformation in Ancient and Modern Peru. Just as we saw in Central America that the art of the potter supported the reality of the custom, so in Ancient South America the practice is portrayed in the same way. In the Lambayeque district, north of Truxillo, a black anthropomorphic vase has been discovered which illustrates the custom in a striking manner. The piece represents a squatting female figure, her legs pushed forward and her head slightly tipped upwards and turned towards the left. Upon her lap she is holding a small child. Fixed in position on the child's head is the apparatus for the purpose of deformation. The device is well modelled and its details are clearly shown. It consists of a rectangular plate or board, represented apparently as made of wood and provided with a thong or bandage designed to hold it on to the head of the infant. This board probably had a groove or buckle on its middle portion and to this the ends of the band were fastened. The board, as placed in position over the occiput, is much larger than the back of the head. By means of bands, one going round the head and the other over the head in the direction of the sagittal suture, the board is fixed to the head.[114] From this vase it would appear that simple occipital flattening was sometimes practised with the intention of deforming the head, although we do not know whether occipital flattering was all that was intended. As we have seen from the vase the occipital board is apparently kept in position by means of a band encircling the head. We have unfortunately no evidence as to the tightness of this band. If it were so tight as to cause the board at the back to press

[113] Torquemada, Lib. XIV, Cap. 25, Pt. ii, pp. 582 *ff.* *Cf.* Haven, p. 100.
[114] Cachot, pp. 348-349, see Pl. XLVII, *a*.

against the occiput with considerable force, then we might expect not only that occipital flattening would result but also an elongation upwards to compensate for the circular constriction. If on the other hand the band were merely loose and just fitted the head, then occipital flattening would result not from the actual apparatus together with its bands but from the weight of the child's head when lying on its back.

The theories advanced to explain or adequately to describe the custom in South America have been many, and some of them are ingenious, if not convincing. The fact that, generally speaking, the practice seems to have been a privilege of a class suggests, as Wiener has pointed out, that some advantage was supposed to accrue from it, although he is wrong in stating that the heads of men only were deformed.[115] The reasons given by Salcamayhua cannot, I think, be considered seriously in their literal interpretation; and similarly Angrand's[116] idea that the custom had taken root in the belief of a serpent ancestor cannot be admitted. Neither can we accept McMillin's theory that the forehead was considered the seat of individuality and initiative and that anything done to hinder its growth encouraged devotion to the public welfare, an idea that he may have derived from Salcamayhua.[117] From the existing evidence it would not be reasonable, I think, to attempt to evolve a separate explanation for the custom of artificial cranial deformation as seen in the South American Continent. It is linked up with the same customs throughout the whole of Central America and the West Indian Islands; and from there the distance to Florida and the region of the Natchez is not great. We have in South America not only the same class distinctions as those elsewhere, but even similar methods of constructing the apparatus for the purpose of the deformation. Whatever theory we may accept to describe the practice in South America, the same theory must, I think, be applied elsewhere.

Before summing up the information we have concerning the Peruvian custom we must touch upon one more point which we have already had occasion to mention in another place. The supposition that cranial deformation has serious effects upon the health has been made, as we have seen,

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[115] Wiener, p. 81. [116] Wiener, p. 82. [117] McMillin, p. 256.

by various writers,[118] but any specific effects, with the exception of apoplexy, have been passed over whilst making generalizations. In Europe we noted that Lagneau and Lunier had suggested that erotomania had been induced by deformation as practised in Deux-Sèvres, and the same effects have been suggested by Posnansky[119] as occurring amongst certain of the Peruvians. This writer has suggested that it is possible that extreme occipital flattening has a serious effect, and that perversions of the sexual instinct can be more easily produced in persons so distorted. He examines the erotic pottery of the Chimu coast which illustrates not only a number of the ordinary perversions but also other subjects not usually represented.[120]

It would seem to me unlikely that the effects supposed by Posnansky to be due to deformation are in fact the results of any such distortion, since similar reports should have been received concerning other peoples, whereas I do not think that this has occurred to any great extent. The fact of the prevalence of homosexual practices in the Manabi district in ancient times, however, is of some interest. Cieza de Leôn has a chapter upon the practice in his chronicle,[121] and we know from him that it was found mainly at Puerto Viejo. The acts were said to be performed in public; male

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[118] *Cf.* Giachetti, p. 203.

[119] Posnansky 4: *cf.* Krauss and Reitzenstein.

[120] A fine collection of these objects exists in Berlin, but since the existence of two factories for the production of fakes has been reported, caution is suggested. In this connection it may be of interest to note that certain of the questions in an old confessional book published in Lima in 1644, which was used amongst the native population, indicates a lax morality amongst both sexes. Thus penitents are questioned as to their relations with dogs, goats and mares, and thus the evidence from the ceramic art is fortified by the literary material. (See Carrera, pp. 168 *ff.* The edition of 1880 is not an exact reprint of the earlier edition. *Cf.* Brüning, pp. 358 *ff.*, and also question 32, p. 89 of L. Bertonio's confessional book published in Chucuyto in 1612. Brüning has also dealt with this matter in ANTH, 1909, VI, 101-112: 1910, VII, 206-211: 1911, VIII, 199-209). It is not generally known, I think, that similar erotic scenes to those portrayed upon the Chimu pottery are found amongst the wooden carvings of the Nootka Salish, although I am not aware whether they are of great rarity or whether a number have been recovered and hidden away in the corners of ethnological museums. Those that I have myself inspected are in Berlin.

[121] Cieza de León, Cap. XLIX, pp. 172-174: *cf.* Saville, vol. I, p.15.

prostitutes attended, and the temples together with the rites held therein had obviously a religious significance and were not merely unbridled outbursts of popular lubricity. Montesinos gives an account of the laws which were later passed against these practices,[122] and there is little doubt that at one time these customs had in Peru an importance which can be paralleled in many other parts of the world, and are of great social and psychological interest.

Summing up then the evidence from Ancient Peru we have seen that two main forms of deformation can be distinguished, that found on the coast and that found in the highlands.[123] At certain points intermixture seems to have taken place and from what we know of certain of the graves it would appear that class distinctions were undoubtedly present. Finally the methods used to achieve the results as seen upon the crania are made quite clear to us by the anthropomorphic vase of Lambayeque and the actual piece of apparatus found in the child's grave at Campo Morado.

We now proceed southwards beyond the confines of the old Empire of Peru and enter the vast expanse of country constituted by the southern provinces of the Argentine, south Chile, Patagonia and Tierra del Fuego. Archæological and skeletal material indicates that two types of man in this part of South America can be distinguished, one brachycephalic and the other dolichocephalic.[124] Cranial deformation seems to disappear gradually as we proceed southwards, and I cannot find any reliable evidence that the Fuegians ever practised it.[125] The craniology has not been investigated

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[122] Montesinos, Ch. XVIII, pp. 143-148. Such customs were formerly known amongst the Huaxtec of the Vera Cruz district. Diaz del Castillo, who assisted Cortés, records very similar facts to Cieza de León and states that on the coast boys dressed as women used to gain a living through prostitution. Not only were homosexual tendencies common, but the perverse imaginations of the upper classes equalled those of the Romans in their most luxurious days. Among other ingenious conceits was the practice of imbibing wine *per tubum in ano*, an idea for which cranial deformation can hardly be held responsible (see Diaz del Castillo, Cap. CLVIII, vol. IV, p. 218).

[123] L. A. Gosse, 3 (pp. 160 *ff.*) distinguishes three forms from the ancient records, not realizing that *oma* means "head": *cf.* Domingo, de S. Thomas, p. 23, "*Cabeça de qualquiera cosa = hóma.*"

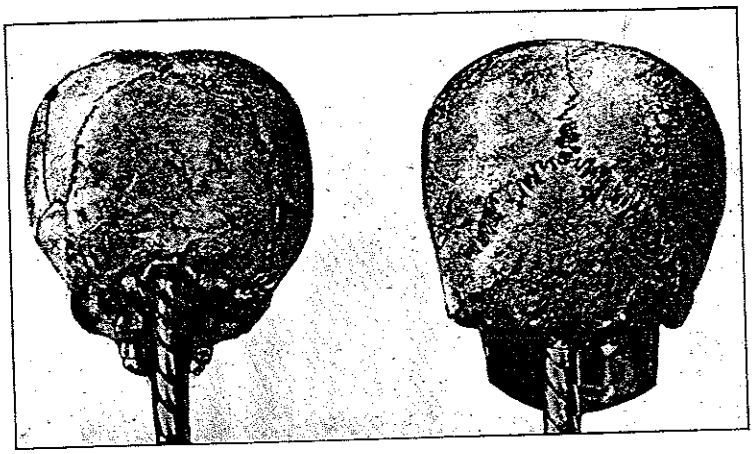
[124] Joyce, 1 p. 237: Outes, 1, p. 267.

[125] *Cf.* Hyades and Deniker.

fully[126] and a good deal of mixture has taken place at various times.

Nevertheless, Verneau has been able to recognize four Patagonian types where cranial deformation has been observed. These he calls (*a*) Tehuelche, (*b*) the Platy-brachycephals, (*c*) the sus-brachycephals, and (*d*) the Araucanians. The forms of deformation also are well marked. There is first of all the simple occipital flattening, which is still frequent and which is the result of the position in which newborn children lie for long periods of time (*cf.* Pl. LIII). In modern times infants are placed upon the convex surface of a sort of cradle which can be fastened either on the back of a horse, to which it is applied like a saddle or on the back of a human carrier. In this arrangement the child is tightly secured and the compression exerted on the back of its head causes occipital flattening. Since the ancient inhabitants of Patagonia apparently did not possess the horse, such cradles as are made to fit the animal to-day could not have been employed, but there is no reason to doubt that the position of dorsal decubitus was as common then as it is now. This flattening, however, is not universal. Among the Tehuelche specimens 60·87 per cent. were deformed, whilst amongst the ancient Araucanians 57·14 per cent. show deformation. Generally speaking the skulls flattened occipitally (*cf.* Pl. LIV, *c.*) are perfectly symmetrical, and plagiocephaly is not common, a fact which suggests that when bound in its cradle the infant was not able to move its head to any great extent; on the other hand some examples are found which are so slightly flattened that it might seem that the restraining influences were but weak. The modifications never effect exclusively the occipital region: parts of the parietals are also influenced. The whole of the posterior part of the parietal region falls perpendicularly and inion is not raised. The external occipital protuberance is pushed downwards, which does not prevent it from presenting occasionally considerable development. The occipital flattening naturally results in a reduction of the maximum antero-posterior diameter, the other diameters not being affected to any great extent. This form of deformation, according to Verneau is most common in the Rio

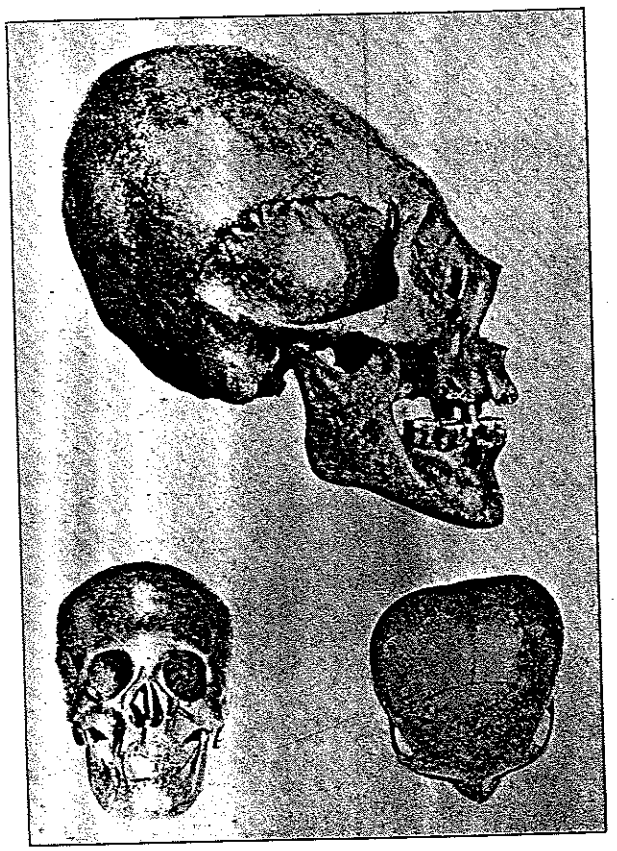
[126] For the craniology see Marelli, 1, and for a synopsis of Patagonian craniology see Marelli, 4.



After *Imbelloni.*

a

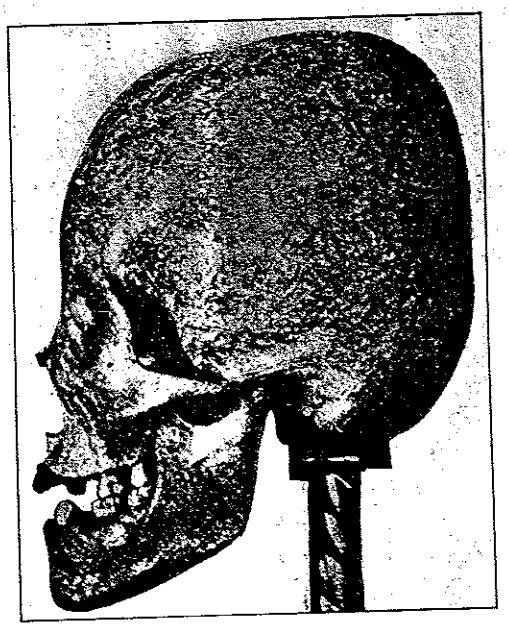
Relative Position of Lambda in two types of Deformed Skulls.



After *von Rosen.*

b

Deformed Skull from Casabindo, Puna de Jujuy.



After *Imbelloni.*

c

Deformed Calchaqui Skull.

Negro district where 32 per cent. were found deformed as against only 24 per cent. in the Chubut district, whilst at Santa Cruz out of 10 specimens none showed any deformation.[127] The next form of deformation is a simple frontal flattening which is not common, but according to Verneau is certainly present in a number of cases. Two good examples were found in the district near Viedma at the mouth of the Rio Negro. They are reported as having foreheads which retreat to such an extent that intentional deformation is indicated. In one specimen the median part of the frontal bone has been almost completely flattened, which suggests the use of a deforming board or plate. The rarity of this form of deformation had led Verneau to suspect that external influences can be detected and we shall see that other forms of deformation found in this area support the same supposition.[128] Similar frontal flattening has been noted by Lehmann-Nitsche,[129] Burmeister[130] and Martin[131] who says that in a number of crania found on the north bank of the Rio Negro, 50 km. up-stream from El Carmen de Patagones, clear cases of parieto-occipital flattening were seen and also some of fronto-occipital deformation, although the age and geological horizon could not be accurately determined. In certain of these cases Martin concluded that circular bandages had been used, a conclusion to which Virchow also was led by his observations,[132] but which does not seem to me to be very probable. Another type which Verneau[133] notes and also Moreno,[134] is that described by them as "Aymara," by which they mean the deformation through circular bandages. The latter writer claims to have discovered over 100 skulls of this type, but Verneau has seen only four specimens and can say but little about the origin of any of them. It would appear that certain skulls from this region approach the type of skull deformed by the circular bandage, although I do not know whether the numbers discovered reach Moreno's estimate. Fronto-occipital and fronto-parietal flattening have also been

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[127] Verneau, 3, pp. 122-125: *cf.* Fitzroy, King, &c., vol. II, p. 154: Huxley, pp. 268-269: Verneau & Vaulx, p. 119.
[128] Verneau, 3, pp. 125-126.
[129] Lehmann-Nitsche, 1.
[130] Burmeister, p. 342.
[131] Martin, R., pp. 497, *ff.*
[132] Virchow, 5, p. 52: *cf.* Prichard, p. 92.
[133] Verneau, 3, pp. 126-127: Verneau, 1, p. 430.
[134] Moreno, 2, p. 491.

observed,[135] both forms in the district north of the Rio Negro, and the appearance of the skulls suggests that either boards were responsible or else the cradle-board[136] used in conjunction with a frontal flattening pad. In the most exaggerated cases the occipital region is compressed backwards from above downwards and from behind forwards. Verneau discovered, even in the small series that he was able to collect, all degrees of this form of distortion. In some the forehead is retreating whilst the occiput is only slightly flattened, whilst in others the reverse is the case.[137] Pl. LV. gives four specimens of deformations from this region. In the upper row starting from the left we have a case of simple occipital flattening and to the right of this an example of the deformation produced by circular constriction. In the lower row we have on the left a good example of fronto-occipital flattening and on the right a specimen of the rarer simple frontal deformation which we have already discussed. It will thus be seen that even in those parts of ancient South America where Peruvian influence is very slight, we still find the two important varieties of Coast and Highland deformation, although they are rarer and are confused with other methods.[138]

We have now seen the practice of artificial cranial deformation in South America extending from Guiana around the northern and western coasts as far as the frontiers of the ancient Empire of Peru. We have even seen traces at the mouth of the Amazon, and we have followed it fading away as we go southwards through the Argentine Republic, southern Chile and northern Patagonia. We have discussed the two predominating forms of deformation and we have seen the widespread influence of the cradle-board together with the sporadic appearance of other methods of cranial distortion.

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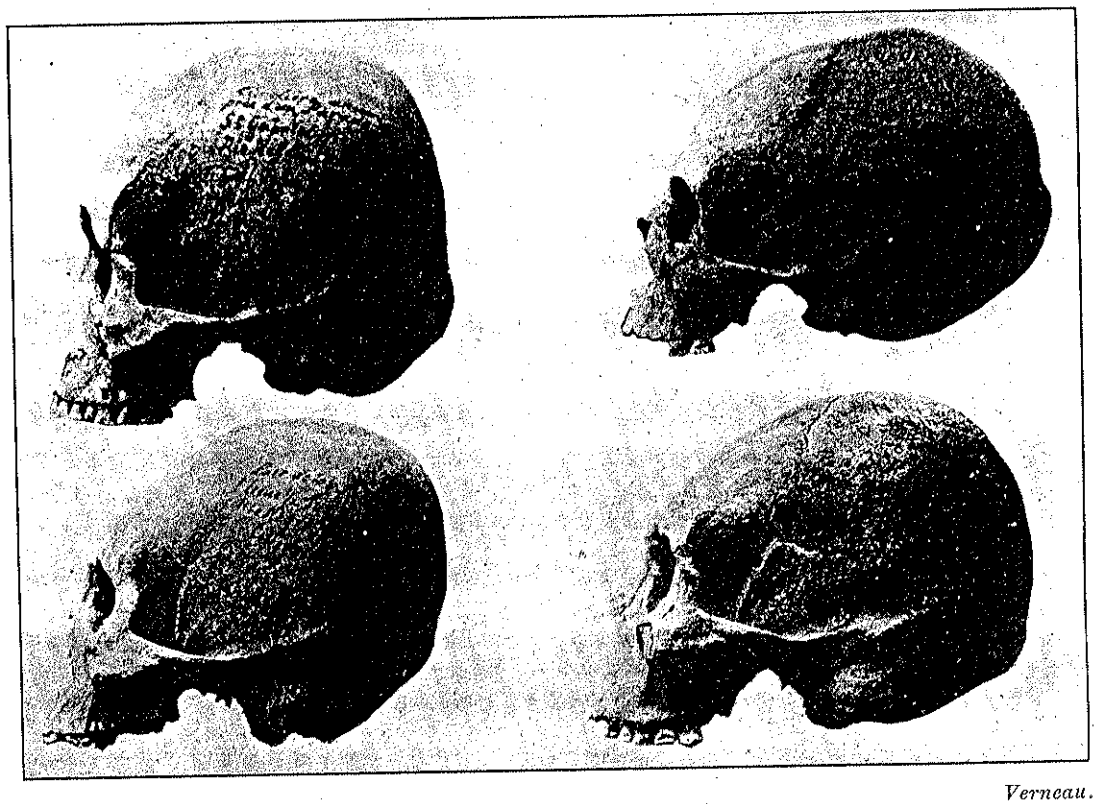
[135] Moreno, 1: Puccioni, 3: Verneau, 3, p. 129.

[136] *Cf.* Virchow, 7, p. 200. Simple occipital flattening is common throughout the region and elsewhere. *Cf.* a skull found near the mouth of the river Rapel south of Valparaiso and described by Philippi.

[137] Verneau, 3, p. 129.

[138] Seen in norma lateralis the two varieties of Coast (boards) and Highland (bandages) show decided differences, and seen in norma occipitalis the difference will be immediately perceived. Here the position of lambda is the important point to be noticed. In the coastal variety the position of lambda is central while in that of the Highlands it is pushed upwards (see Pl. LIV, *a*: left, Highland; right, Coast).



After *Verneau.*

Deformed Skulls from Patagonia.

We can hardly doubt, I think, that the custom was spread southwards through the influence of the north, and that the difference between the coast and highland types as seen in the north and the same types when seen in the south, where intermixture and confusion have been noted, is what would be expected if the custom spread from the north to the south. Until the chronology and sequence of the various movements of peoples have been worked out, it would be idle to attempt to hazard any guesses as to the precise manner in which the practice spread. The fact that it can be observed fading as we approach the confines of at least one important centre is significant, and suggests that it would probably be wiser to seek a starting point in the north rather than in the south. However that may be, future archæological investigation will doubtless be of service if it be closely correlated with observation of the skeletal material.