

CHAPTER I

ARTIFICIAL CRANIAL DEFORMATION IN EUROPE

IT is proposed in the following pages to give a general survey of the practice of cranial deformation in divers parts of the world. A short account will be given of the various instances printed in the existing literature; a criticism will be offered of certain of the conclusions to which inquirers have hitherto been led; and an attempt will be made to draw a rough line between the distribution of intentional and unintentional factors.

We will commence the study with an examination of cases occurring in the Old World, and Europe will be as good a starting place as anywhere else. Indeed, perhaps it would be proper to begin with Europe, since those few ancient authors who have mentioned the practice do not seem to have recorded any certain examples of peoples practising cranial deformation beyond a small group in the south-east of the Continent spreading partially into Asia. It may be as well, also, to divide our study into two sections. We will begin by a consideration of artificial deformation as occurring in skulls which have been discovered prior to about the nineteenth century, and then we will proceed to discuss the later instances and the possible influence that popular obstetric practice may be said to have had upon them. Let us commence, therefore, by an examination of those sites where skulls have been discovered illustrating early cranial deformation in Europe.

If we glance at Map I, which shows a certain number of the older stations where deformed crania have been found, we shall notice at once a few facts deserving consideration. It must be remembered, however, that these places are merely the ones in which actual excavations have resulted in successful discoveries. We have no means of telling if further

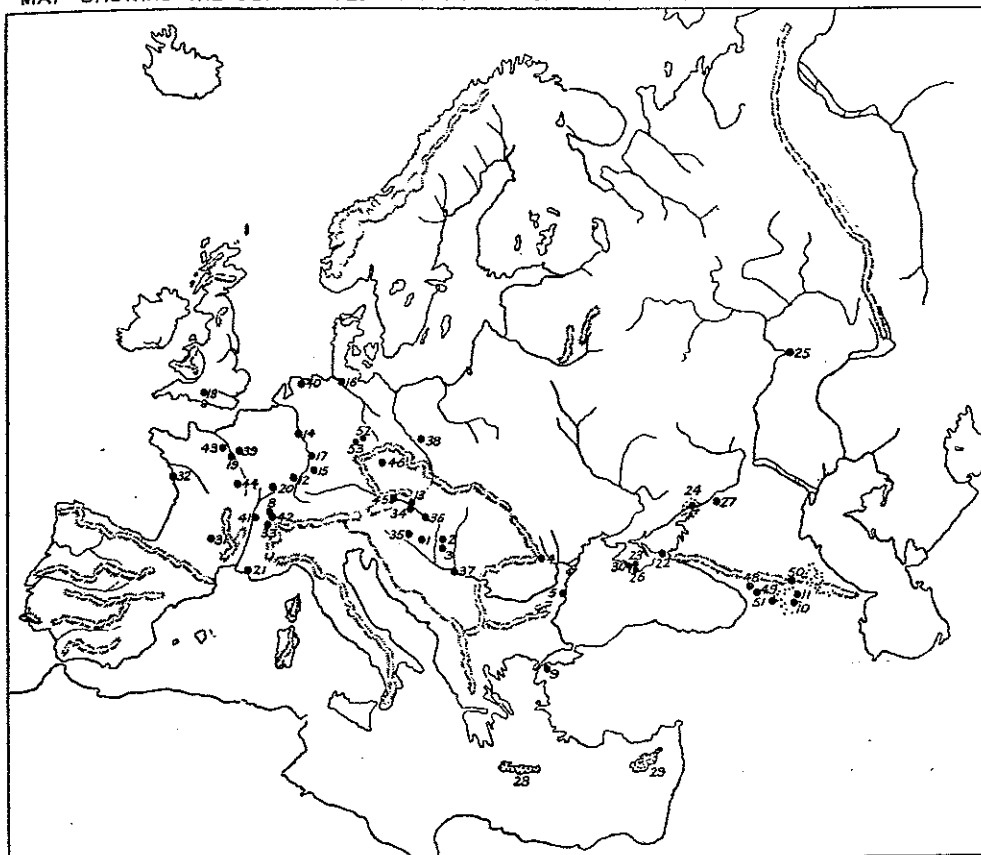
MAP



- 1 Len
- 2 Czo
- 3 Szeg
- 4 Odo
- 5 Con
- 6 Trie
- 7 Bol
- 8 Bel
- 9 Eren
- 10 Tifi
- 11 Sam
- 12 Stra
- 13 Vien
- 14 Bon

Note.

Map 1
MAP SHOWING THE OLDER SITES WHERE ARTIFICIALLY DEFORMED CRANIA HAVE BEEN FOUND



KEY TO NUMBERS.

1 Lengyel.	15 Heilbronn.	28 Crete.	41 Corveissiat.
2 Csongrad.	16 Hamburg.	29 Cyprus.	42 Saint-Prex.
3 Szeged.	17 Niederolm.	30 Sevastopol.	43 <i>Guiry.</i>
4 Odorhei.	18 <i>Salisbury.</i>	31 <i>Martiel.</i>	44 <i>Saint-Genest.</i>
5 Constanta.	19 Paris.	32 <i>Chaumes.</i>	45 Grafenegg.
6 Trieste.	20 Voiteur.	33 Villy.	46 Podbaba.
7 Bologna.	21 Marseilles.	34 Atzgersdorf.	47 Padua.
8 Belair.	22 Kertch.	35 Velem.	48 Urusbii.
9 Erenkeui.	23 Inkerman.	36 O-Szöny.	49 Otluk-Kala.
10 Tiflis.	24 Rostov.	37 Pancsova.	50 Kazbek.
11 Samthawro.	25 Samara.	38 Budyne.	51 Digor.
12 Strasbourg.	26 Bia-Sala.	39 <i>Vendrest.</i>	52 Lützen.
13 Vienna.	27 Ihinka.	40 <i>Schaphalsterzjhl.</i>	53 Obermöllern.
14 Bonn.			

Note.—Those sites where skulls have been found of which the artificial character of the deformation is in doubt have been italicised.

excavations upon an extended scale might not reveal many more examples and enlarge their distribution to a very considerable degree. All we can do is to examine the distribution in the light of our present knowledge and note any salient characteristics which appear to be worthy of attention. Now the first thing that must strike even the most casual observer is the proximity of the stations to river valleys. Thus the Seine, Rhine, Rhône and Elbe are each noteworthy, as are also the Danube, Don and Volga, where Samara may be only a type station, to which may be compared the Kura or the Tiflis region. There is some reason also to suppose that signs of a coastal distribution may be detected, which suggests the plausible assumption that the practice may have originated on the coast and then spread up the rivers, or possibly was brought to the coast from without and from there diffused along the valleys and inland. However this may be (and a great deal of further excavation would be necessary before arriving at a decision) the facts of an apparent river and coastal distribution are all that can be justifiably insisted upon from a consideration of the plan of those stations hitherto discovered.

We will then begin with a study of the finds in Western Europe. In the British Isles it has not yet been proved, I think, that any skulls have been discovered which have been affected without any doubt by the process of artificial deformation. Distortions undoubtedly occur, both posthumous and otherwise, but it must be always remembered that pathological conditions, premature closing of the sutures and similar factors are often responsible for abnormally shaped crania. Again it is thought by some that ante-natal moulding, especially that produced by occipito-posterior and brow presentations, causes some permanent effect upon the skull, although normally demoulding rapidly proceeds after birth, becoming decreasingly slow as life continues.¹ Among ancient

¹ See Greenwood. Professor Francis J. Browne (in a private communication, dated July 3, 1928) points out that the general idea amongst obstetricians is that moulding at birth leaves no clinical trace in after life. It must be remembered that if a skull deformity was existent before labour then it might be the cause of a face presentation. Greig, however, is of opinion that plagiocephalic conditions may be produced during parturition and is inclined to regard as of slight importance such influences as decubitus, which formerly was (and still at present is) held to be an important factor. *Cf. Lobstein, vol. i, p. 100.*

British skulls a certain occipital flatness has been pointed out by J. B. Davis who was of the opinion that some examples were artificially deformed² and show the influence of the cradle-board,³ an opinion partially supported by Sir Daniel Wilson who held the view that the Ballard Down skull⁴ showed marks of an artificial flattening of the occiput.⁵ But the most famous of all the British skulls which has been believed to exhibit signs of artificial distortion was that discovered in the Harnham Hill excavations, Lowfield, near Salisbury, and which were reported by Akerman in 1853.⁶ The age appears to have been of late pagan date, the settlement possibly belonging to the West Saxons or Jutes. With the skeleton were found glass beads, and a broad iron buckle at the waist, together with a bronze ring and a flat, circular bronze fibula. The skeleton was that of an adult some 5 ft. 7 ins. in length. In an area of about 140 ft. long by 20 ft. broad, sixty graves were excavated, but it does not appear that anything abnormal was discovered apart from the skull.⁷ Akerman himself did not seem to be decided in his view as to whether the deformation of the skull was artificial or not. Davis, however, was strongly in favour of its artificial character believing that in the inclination of the wings of the sphenoid was conclusive evidence against posthumous deformation. He says that their position seems to be altered, pushed upwards and backwards, and the positions and forms of the adjacent frontal, parietal, and temporal bones are modified.⁸ There does not seem to me, however, sufficient evidence to prove an artificial factor. The skull is certainly abnormal in shape, but what appears to me to be lacking, if artificial deformation be assumed, is any convincing sign of the application of apparatus.⁹ In order that a skull may assume the shape of the Harnham Hill specimen

² Davis, J. B., 1, p. 291.

³ Davis, J. B., 1, p. 294.

⁴ Davis and Thurnam. Pl. 45. Cf. Rolleston's opinion of the Rudstone skull in W. Greenwell's *British Barrows* (London, 1877), p. 593.

⁵ Wilson, 1, p. 30.

⁶ Akerman. Cf. Davis, J. B., 3, p. 2.

⁷ Now in the Museum of the Royal College of Surgeons, London, No. 4, 2505. See also Davis, J. B., 5, No. 260, pp. 29-32.

⁸ Davis, J. B., 5, p. 30.

⁹ I take this opportunity of thanking my friend, Mr. E. P. Stibbe, F.R.C.S., for his assistance in an examination of the skull which we undertook in June, 1928. We are, I think, in substantial agreement regarding the doubtful nature of the alleged artificial deformation.

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through artificial means some very definite apparatus, probably of the bandage variety, would have had to be applied. Now there are none of those transverse grooves or depressions which are usually so common in skulls affected by a bandage deformation. The frontal bone is rounded and comparatively smooth. The occiput is similarly free from marked depressions and the inclination of the wings of the sphenoid is not a certain indication of the artificial character of the deformation.

Few deformed crania appear to have been discovered in the Netherlands. A distorted skull of a shape recalling the Caucasian macrocephals which we shall discuss later, was found at Schaphalsterzijl, near Winsum, about 13 km. north of Groningen and with it a coin of 1583. Whether the skull can be approximately dated by the coin is uncertain, but Folmer¹⁰ inclines to the view that it can be dated as somewhere about the middle of the sixteenth century, and considers it undoubtedly artificially deformed, an opinion not shared by Delisle,¹¹ who regards the distortion as pathological. Similarly in the south Netherlands few skulls showing certain artificial cranial deformations have been dug up, although Vesalius in his book on the human body said that: "*Belgis oblongiora caeteris propemodum reservantur permanentve capita, quod matres suos puerulos fasciis involutos, in latere et temporibus potissimum dormire sinant*",¹² a statement which is important when we recognize the characteristic form of head often given by decubitus.

In France, the classic European country for modern artificial cranial deformation, a number of skulls have been discovered dating from the earlier epochs. Indeed, it has been claimed that skulls dating from neolithic times and deformed artificially have been found. Of this theory Marcel Baudouin is the chief exponent, and it may be convenient to consider his evidence in this place before dealing with those cases where the deformation is more precise. In 1909 Baudouin¹³ published an account of some skulls found at

¹⁰ Folmer, 1, 2.

¹¹ Delisle, 5.

¹² Vesalius, Lib. 1, 5. Cf. the statement by Spigelius, the Flemish anatomist. "*Alta capita, et acuminata habent Genuenses ferè et Belgae, a fasciis similiter, quibus infantes nimium stringunt. Germani ferè breve caput obtinent, quòd dorso semper in cunis incumbant*" (Lib. 1, c. 8, p. 18), and that of Sömmerring, 1, 62.

¹³ Baudouin, 1. Cf. Baudouin, 2.

Martiel, in the Grotto de Jammes (Aveyron), about 10 km. north-west of Villefranche de Rouergue. A skull showed what Baudouin described as the Toulouse form of deformation, but this was not strictly the case. The feature which struck Baudouin as apparently due to artificial causes was a transverse sulcus, posterior to the coronal suture, and which seems as if it might have been caused by the tight band of some head-dress. A similar appearance was noted in the skulls found in the alleged neolithic cemetery of Belleville at Vendrest (Seine et Marne)¹⁴ on the southern slope of the Montagne de Belleville, Rademont, and about 3 km. from Lizy-sur-Ourck, north-east of Meaux. Forty skulls were derived from this burial place, together with polished stone axes and other tools. All presented a circular depression behind the coronal suture which was said to be continued below theinion.¹⁵ A similar find was reported to have been discovered by Ferton in 1899 at the neolithic site of Bonifacio,¹⁶ although it is not clear if the post-coronal sulcus was in the same position as that found upon the Vendrest skulls. The existence of this transverse sulcus is compared by Baudouin himself to that seen upon the Syrian type skull from Cemetery 5 described by Professor Elliot Smith in his anatomical report¹⁷ published in the Bulletin of the Archæological Survey of Nubia. According to the latter, this post-coronal sulcus does not imply deformation of the Nubian specimen, and there is no reason to suppose that the examples cited by Baudouin are of a different type¹⁸. Such sulci are by no means rare,¹⁹ especially in female subjects. They are possibly caused, it is thought, by the persistence of an exceptionally powerful epicranial aponeurotic band, and are prevalent among, for example, West Scottish types.²⁰ Without an attentive examination it would be difficult to say if the alleged deformation reported by Baudouin²¹ as occurring among skulls taken from the cemetery of Chaumes (Vendée), some 3 km. north-west of Saint Gilles-sur-Vie, is justified or not. Bracelets and pottery dating as from the third century A.D. were found, and nine entire skulls were discovered. According to Baudouin the burials appear to have been of the Gallo-

¹⁴ Baudouin, 5. Cf. Baudouin, 4.

¹⁵ Baudouin, 4, p. 228.

¹⁶ Baudouin, 4, p. 229.

¹⁷ Archæological Survey of Nubia: Bull. 2 (Cairo, 1908), Pl. XLV.

¹⁸ Verbal communication of January 19, 1928.

¹⁹ Blair.

²⁰ Young.

²¹ Baudouin, 6. Cf. Baudouin, 3.

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Roman period, and it is probable from the account given that the annular deformation was similar in type to that found on the skulls from Belleville. Moreover, without a good deal more evidence, it would, I think, be hazardous to assume that any skulls dating from neolithic times in France have unmistakable marks of cranial deformation.²²

Passing now from the more doubtful examples we may proceed to those specimens where the artificial character of the deformation is practically certain. In Paris itself skulls have been discovered in which the deformation is marked and clearly due to compression by bandages or tight head-dresses. Thus in an old burial place in the Rue des Innocents, which is considered certainly anterior to the seventeenth century, excavations took place in 1866.²³ Broca,²⁴ however, in commenting upon one of the skulls from the same cemetery describes it as hypsicephalic with a flattening behind the ears and the frontal bone almost vertical, dating the find as probably not before the twelfth century A.D. In conclusion he remarks that the evidence for artificial deformation is not entirely satisfactory since it is possible that the shape of the skull may be due to pathological causes. Again during excavations in the Gallo-Roman cemetery at Strasbourg eighty skulls were discovered of which only one was alleged to be affected by artificial distortion. This specimen was similar to those found in the Crimea, which we shall discuss later, and according to Straub²⁵ may have been of Hunnish or Avar origin. The forehead is retreating, and the whole skull exhibits a remarkable elongation produced probably by the application of bandages. But the most important of the French artificially deformed crania is undoubtedly that discovered in Jura when building a house at Voiteur, about 10 km. north-east of

²² The same objection applies to the alleged deformation found in the skulls from the graves at Guiry, some 40 km. north-west of Versailles. These were considered to be certainly neolithic, and the deformation consists "en une compression lambdo-occipitale qui a refoulé le crâne en arrière et a laissé sur le sommet et dans la région occipitale un sillon bien visible." Eleven skulls were found, and in some the post-coronal sulcus was most marked. See Lagotala, p. 784.

²³ Hamy, 1.

²⁴ Broca, 1.

²⁵ Straub, p. 118; Pls. XIV and XV. Cf. Waldeyer of Strasbourg who mentioned a mediæval macrocephalic skull from Strasbourg in 1879. This is possibly the same specimen. See *Corresp. d. deutsch. Ges. f. Anthropol., Ethnol. und Urges.*, 1879, p. 71.

Lons-le-Saunier. Situated at the foot of a hill covered with the vineyards of Château-Chalon and Ménétru, Voiteur is noted for its ancient earthworks and the remains of an old priory. Here, in the middle of the nineteenth century, some stone-slabbed graves were discovered²⁶ dating possibly from the fourth or fifth century A.D. Twenty skulls were recovered and some miscellaneous objects in iron almost eaten away by rust were found. The human remains were unearthed about 1 metre below the surface; the feet were towards the east, and amongst the débris a plaque was discovered which was thought to date probably from the fourth century of the Christian era. Of the skulls one only showed marks of deformation, and it has been said that this is the most remarkable specimen found in France.²⁷ The facial region is unfortunately lacking, but the skull itself is clearly of the sugar-loaf or conical form. The deformation has evidently been effected by bandages encircling the head, the marks of their compression being still discernible in the frontal and occipital regions. The antero-posterior diameter was above all reduced, which produced a remarkable development of the cranium in a vertical direction, where growth alone was possible, and where compensation for the circular compression would occur. It is clear, as Broca has pointed out, that in this case bandages were undoubtedly used and not boards, deformation produced by the latter being of another type.²⁸ There would appear, I think, to be little doubt that the Voiteur skull is artificially deformed by means of compressing bandages, but whether boards can be said to be responsible for the alleged frontal depression observed in certain skulls from the lower levels in the excavations at Saint Genest by Artigaud²⁹ is extremely doubtful. I have not seen a detailed description of these discoveries and it may perhaps be more profitable to turn our attention to the more precise form of deformation seen on some other skulls found in the Jura region. The most important are those discovered near the little village of Corveissiat, about 17 km. south-east of Treffort and famous in the district for its beautiful cascades. Two crania were found here³⁰ in a tumulus

²⁶ See Gindre et Morétin; Lagneau, 1.

²⁷ Lagneau, 5, p. 91.

²⁸ Broca, 3.

²⁹ Artigaud.

³⁰ See Chantre, 1, pp. 29 ff.; Album, Pls. 46-48. These skulls are (or were) in the Museum of Natural History at Lyons.

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dating possibly from the Early Iron Age and disturbed while a church was being built. Both are, unfortunately, much damaged, but enough remains to indicate the form of deformation they had suffered. In each a form of distortion is noticeable similar to that occurring in the Voiteur skull. The height of one skull has been increased by a circular compress or bandage and in addition apparently the frontal bone has been flattened. The second example does not seem to have been deformed in quite the same way. It is more elongated and deformation may have been effected by a bandage passing just anterior to bregma and then proceeding over inion or below it. Of the two the first is the more distinctive. Artificial deformation seems to be indubitable, although we cannot say if the encircling bandage was intended to distort the skull, or whether it was merely part of a tight head-dress worn in infancy.

Passing southward, we have only the Marseilles skull to note before leaving France. It was discovered by Fallot³¹ towards 1881; the skull is attributed to the second or third century³² of our era, and the deformation is similar to that of the first from Corveissiat described above. M. Chantre records the fact that a similar skull is to be seen in the Museum of the Château Borély in Marseilles.

We will now pass further eastwards and, commencing in the north, proceed until the waters of the Mediterranean are reached. Firstly, then, I am not aware that any ancient deformed skulls have been discovered in Scandinavia. According to Worsaae³³ cranial deformation was not found there, and Professor H. M. Chadwick³⁴ records the fact that he does not know of any evidence for it in Norse or Anglo-Saxon literature or indeed anywhere in Scandinavia. Similarly, Düben,³⁵ in his examination of skulls from Lapland, does not mention the existence of deformation in this brachycephalic people, whereas posthumously deformed skulls are not uncommon.³⁶

In Switzerland, a certain number of skulls deformed similarly to those found in the Jura region, have been reported. In 1855, H. J. Gosse³⁷ drew attention to certain old burial-grounds both in Savoy and Geneva, which contained skulls with retreating foreheads, and later³⁸ he described a series of

³¹ Fallot.

³² Fallot, p. 808, *cf.* Chantre, 4.

³³ Worsaae.

³⁴ In a private communication dated May 21, 1928.

³⁵ Düben.

³⁶ Fürst, p. 373.

³⁷ H. J. Gosse, 1.

³⁸ H. J. Gosse, 2.

skulls dating from the Charlemagne period (eighth century), found at Villy, near Regnier, in Savoy. Some of these were said to be of the macrocephalic type, and another curious specimen was also described by Troyon,³⁹ which came from his excavations on his estate at Bel-Air, near Lausanne. These tombs, in a horizon of three successive underground layers, appear to be of varying dates, but the latest is not considered to be later than the end of the eighth century A.D. The Bel-Air skull, if we can judge from the contour drawing, would seem to have been deformed by boards, the frontal bone and occiput being much flattened. In the Villy example, which is probably male, the forehead is also flattened, but unfortunately the skull is imperfect, although the frontal bone, occipital bone and part of the parietals are intact. In the case of the skull from Bel-Air (also male), which is dolichocephalic and orthognathous, it is said that it was found in the deepest stratum⁴⁰ and may be of considerable antiquity. A similarly deformed skull was found at Saint-Prex,⁴¹ on the northern shore of the Lake of Geneva, west of Lausanne. This cranium, which is attributed to the fifth or sixth century A.D., does not seem to have been described in detail, and I do not know where it has found a final resting-place. Again, no detailed information appears to be available on the skull of a child found at Meilin, about 14 km. south-east of Zürich, where numerous remains of lake villages have been discovered. Figuier,⁴² who mentions this specimen, remarks upon its extreme dolichocephaly, but it is imperfect, and although the occipital region shows a considerable degree of development, it is, I think, uncertain whether artificial deformation has been practised.

In Germany, Austria, Hungary and adjacent regions cranial deformation appears to be well represented in a number of interesting discoveries. The fact that the women of Hamburg were accustomed to bind up children's heads for the purpose of elongating them is recorded in the following lines from the anatomist Laurenberg,⁴³ who wrote in the first half of the seventeenth century:—

"Macrocephalae fere etiam sunt Hamburgenses foeminae, quae ipsae ligationibus . . . , capita in longum assuefaciunt, quod et turpe est et minime salubre."

³⁹ Troyon, 1. Cf. Troyon, 2.

⁴⁰ Rutimeyer, p. 55.

⁴² Figuier, p. 359. Figs. 229, 230.

⁴¹ Hervé.

⁴³ Laurenberg, Cap. VIII, 6, p. 63.

Similarly Sömmerring,⁴⁴ in writing of women of the same city, says:—

"Hamburgenses feminae caput fasciis involvendo et comprimendo oblongae calvariae formae quam maxime olim studuisse dicuntur,"

and Krause,⁴⁵ at a Congress in 1878, exhibited a deformed skull of macrocephalic type which was found at a depth of 3 metres in Hamburg itself. As early as 1830 Rasoumovsky⁴⁶ had reported upon a skull discovered in a cave near Baden which may have been deformed, and another said to be similar to the Crimean type was reported⁴⁷ as having been found near Bonn (Meckenheim), but is now apparently lost. In 1862, however, during some excavations at Niederolm, north-east of Saulheim, and about 11 miles from Mayence a skull was discovered which, I think, can still be seen in the Schloss Museum of that city. The grave from which it was derived was said to be part of a Frankish cemetery and may date from the fifth century. Iron and bronze grave goods were found with the remains, together with some dark blue glass beads. The skull itself is probably that of a young female, has a C.I. of 73.1 and its artificial deformation would seem to be undoubted. The whole frontal region from nasion to bregma is flattened and retreating; a slight depression anterior to the coronal suture occurs and another posterior to the same suture is very apparent. The whole skull is elongated upwards and backwards, the deformity being due, probably, to two or more bandages, although the flattened frontal region might suggest the application of a board.⁴⁸ A similarly deformed skull, although with a less pronounced frontal flattening, was found in one of the Alamannic cemeteries near Heilbronn. Again the skull was that of a female, and the skeleton lay extended with the head looking towards the east, the remains being accompanied by a knife and a small piece of pottery. This skull, with a C.I. of 78.8 as opposed to two other normal skulls of a C.I. of 70.1 and 70.3 each respectively, had two pronounced transverse depressions similar to those found on the Niederolm skull, but the

⁴⁴ Sömmerring, 1, 62.

⁴⁵ Krause [W ?].

⁴⁶ Rasoumovsky, p. 157.

⁴⁷ By H. Schaffhausen. See Schliz, 2, p. 204.

⁴⁸ Ecker, 1; Topinard, 4.

occipital region was less flattened.⁴⁹ A similar slight occipital flattening is seen in the Stauffersbach⁵⁰ skull, which is plagiocephalic, of doubtful sex, and may well be not artificially deformed.

We pass now to discoveries further to the east, and will commence with the specimen found at Budyně,⁵¹ some 10 km. north of Prague. This skull was found amongst others on the same site, and its general form and increased height suggest a deformation through the use of a bandage. Further to the south we come to the little village of Grafenegg, which lies near the railway from Krems to Absdorf. Here in 1820 was discovered a remarkable skull which at the time was thought to be proof of Avar influence.⁵²

This specimen was described by Tschudi⁵³ some twenty-five years later, who noted the similarity of its deformation to that form found in Peru. It is of uncertain sex, but possibly female, and is dolichocephalic, plagiocephalic and klinocephalic.⁵⁴ The frontal bone is flattened from nasion to a point anterior to bregma, where it suddenly rises to the coronal suture only to descend again into a depression and then to rise slightly before descending to the occiput. Part of the occipital bone is also flattened, and the whole skull inclines backward being proportionately elongated. Possibly a couple of bandages were employed: one broad band passing over the frontal bone and being secured at the nape, and the other passing over the crown of the head, being secured perhaps under the chin.⁵⁵ A rather similar female skull, and again the only one to be found on the site, was discovered in Vienna and reported by Much⁵⁶ in 1898. Acrocephalic in type with a C.I. of 74.4 it was more compressed than the skull from Grafenegg and the two transverse depressions were as strongly marked. A similar method of deformation appears to have been employed also in the case of the so-called Atzgersdorf skull found near Liesing, which is probably female,

⁴⁹ Schliz, 2, p. 194.

⁵⁰ North-west of Ratisbon, near Parsberg. See Virchow, 17, p. 362.

⁵¹ Matiegka, 2. Cf. Matiegka, 1.

⁵² *Künstlich* . . . , p. 388. Cf. Fitzinger, 1, 2.

⁵³ Tschudi, 1.

⁵⁴ See Baer, 2, Taf. 2³.

⁵⁵ Cf. Schliz, 2, p. 207: Ujfalvy, p. 64.

⁵⁶ Much, 2. Cf. Schliz, 2, p. 198.

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has a C.I. of 76.6 and a somewhat flattened frontal region.⁵⁷ Passing due south from Atzgersdorf we come to the family burial vault at Velem St. Veit (between Graz and Eisenburg), where similar specimens have been discovered. One is male and one female, the male being more compressed and heightened by the fronto-occipital pressure. The same depressions showing marks of bandages are apparent in both skulls, almost a condition of klinocephaly being produced.⁵⁸

Proceeding eastwards the next station which claims our attention is that of Ó-Szöny, on the railway from Vienna to Budapest, via Bruck and Neu-Szöny (Komorn), where a skeleton buried in a half sitting posture together with bronze ornaments were found.⁵⁹ Roman coins dating from A.D. 41 to A.D. 375 were also discovered, thus rendering the date of the burial uncertain. The skull was deformed in the same manner as those described above, although the crown of the head is flatter and the occiput more rounded. (See Pl. I, *a*, *b*.)

Similarly at Czongrad⁶⁰ on the Tisza and at Szekely-Udvarhely (Odorhei) where Attila is said to have held his court, macrocephalic skulls have been discovered. The Czongrad skull was found in 1876, in a tomb of apparently Tartar origin where seven skeletons were discovered including those of some children. Tartar burials were usually in caves, and this proved no exception to the general rule. No objects were found in association with the skeletons and the deformation of the skull in at least one case was well marked, such distorted crania being called "Kutyafejű" (Dog's head tartar) in Hungary.⁶¹ The skull, of uncertain sex, is not a large one. Towards the middle of the frontal bone there is a transverse depression due probably to the action of a bandage. Another depression is seen just posterior to the coronal suture, and the occipital squama does not rise in a perpendicular direction but is slightly depressed. In general form the skull is reminiscent of a truncated pyramid, and Lenhossék believes that it is possible that the flattened appearance of the frontal region is due to pressure from a resistant plate which was doubtless

⁵⁷ Schliz, 2, p. 207. This is probably the same as that sometimes called the Inzersdorf skull. Cf. Baer, 2, Taf. 2³.

⁵⁸ See Török, 1, 2, Schliz, 2, p. 206.

⁵⁹ Lenhossék, 3.

⁶⁰ Lenhossék, 1, 2.

⁶¹ Lenhossék, 2, p. 51. Cf. Steinburg.

secured by a bandage (see Pl. I, *d*).⁶² Similarly the skulls discovered at Podbaba, at the mouth of the Scharcka valley, not far from Prague, show flattened foreheads produced perhaps by broad bandages which went transversely across the forehead and were then brought obliquely behind the occiput near the inion. The height index of one of these skulls compared with the others is 81.39 to 70.27, 70.22 and 71.40. All are dated as from about the eighth century A.D.⁶³

A skull, together with two other undeformed specimens were found also at Pancsova, which we can include in our survey of Central Europe⁶⁴ and then we will complete our brief study by a consideration of the skull found at Lengyel, in Tolna, about 16 km. north-east of Dombóvár. Here was formerly a late neolithic settlement, where objects were discovered showing a spiral pattern which apparently indicated Aegean influence. Tall dolichocephalic skeletons of Nordic type⁶⁵ have also been found at Lengyel, but whether the deformed skull belonged to one of these or to an earlier settlement is not clear. Virchow, who reported it in 1890⁶⁶ attributed it to the late Bronze Age and from the published description it would appear that the forehead was much flattened and very retreating, in many respects the skull having a marked resemblance to that found at Csongrad.

In Italy few artificially deformed skulls have apparently been recorded. In 1878, Canestrini⁶⁷ and Moschen reported the discovery of a female cranium, of possibly Roman period, at a depth of 3.26 m. below the surface in the Piazza Capitaniato in Padua. Fronto-occipital flattening was present, the sutures were not fused, and it is probable that deformation had been effected by two bandages as in the Central European specimens. Similarly under a Roman stratum in the Tominz grotto, near Trieste, a skeleton was found,⁶⁸ of which the head, which lacked the facial region and was incomplete elsewhere, showed again fronto-occipital flattening of the well-known type, and which Virchow compared to that found in the

⁶² Lenhossék, 2, p. 56.

⁶⁴ Lenhossék, 3, p. 241.

⁶⁵ Childe, 2, p. 150.

⁶⁷ Canestrini and Moschen, 1. An abstract was published. See Canestrini and Moschen, 2.

⁶⁸ Vram, 1.

⁶³ Niederle.

⁶⁶ Virchow, 14.

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Philippine Islands.⁶⁹ Again, at Casalecchio, about 6 miles south of Bologna, a skull was discovered which Sergi⁷⁰ reports as being similar to those found in Central Europe and the Caucasus. According to him all these skulls belong to different periods, from the Early Iron Age to the fourth or fifth century of the Christian era. The Bologna example is attributed to the later period if we can judge from the method of burial adopted. Sergi believes that Caucasian peoples, uniting with other advancing nomadic populations, carried the custom into Southern and Western Europe, and according to him the Casalecchio skull shows marked Caucasian affinities. It has been suggested that similar examples of deformed skulls have been found in the ossuary of S. Pietro at Zuglio,⁷¹ but it is probable that these and also those from S. Martino⁷² and elsewhere⁷³ are not artificially deformed.

Before passing on to the finds in Eastern Europe it may be as well if we glance at the evidence which has been presented for the districts with which we have already dealt. We have seen how deformed crania, mostly of the type produced by bandages, have been found in a vast area of which the most important centres may be said to be the Jura region, the valley of the Rhine and that of the upper Danube. When we consider the chequered history of these regions during the years when nomadic hordes were sweeping over Europe, it is obvious that without full and detailed archaeological evidence we cannot hope to obtain any true idea of the racial units to which these remains originally belonged. Moreover, archaeological evidence of the requisite type is almost wholly lacking. Generally speaking, the condition of the graves implies, I think, that they belonged for the most part to mediæval times, and only a few can be traced back to the earlier epochs, even if that be possible with certainty. Tartars, Avars, Huns, Franks—all have been suggested and rejected. With our present knowledge it is impossible to decide, and all that we can do is to draw those conclusions which seem to be strictly compatible with the evidence. Now the condition of certain of the graves, and the care which is still apparent in the disposal of the bodies, suggest that in certain cases at least the persons belonged to distinguished, and possibly aristocratic

⁶⁹ Virchow, 22.

⁷¹ Tedeschi.

⁷⁰ Sergi, G.

⁷² Canestrini and Moschen, 3.

⁷³ Frasseti.

families. Where more than one skeleton has been found, it has been remarked that one or two only of the skulls are deformed, thus implying perhaps that it was by no means a common custom but the privilege of the few. The large incidence of women among the deformed, on the other hand, may suggest that the deformation is due to bandages used in some tight head-dress worn from infancy, thus somewhat resembling the custom found in modern France, as we shall see later. Since it is often said that the Central European deformed skulls are those of Huns, and that the Huns deformed their heads, it may be as well to examine briefly this statement before proceeding to consider the Crimean and Caucasian specimens. The terror that the Huns inspired as they swept across Europe was probably responsible for the tales of horror which grew up about them. Their swarthy countenances and barbarous customs excited disgust, and the older authors did not hesitate to describe them in exaggerated terms. Thus, the Roman historian, Ammianus Marcellinus,⁷⁴ remarked on their custom of branding infants' cheeks, and we are reminded of the passage in Jornandes,⁷⁵ where, apparently quoting Priscus, he describes the Huns and the fear inspired by the horror of their features. Their faces are so made that people flee in terror from them, the old chronicler reports, with their fearful, gloomy aspect, and a head like a sort of shapeless mass (*deformis ossa*) and pin-holes (*puncta*) for eyes. Similarly, the poet Apollinaris Sidonius,⁷⁶ whose *Carmina* contains a good deal of historical information, and who flourished in the middle of the fifth century, speaks of a horde coming from the Scythian plains to the Danube and

consurgit in arcum
 Massa rotunda caput, geminis sub fronte cavernis
 Visus adest oculis absentibus.

A similar account which throws a sidelight on the appearance of the Huns is that furnished by a description of the Avar ambassadors to Justinian I. They appeared to resemble the Huns and therefore inspired terror, but there does not seem to be any mention of the shape of their heads.⁷⁷ Thierry,

⁷⁴ Marcellinus, XXXI, 2, p. 347.

⁷⁵ Jornandes, XXIV, p. 69.

⁷⁶ Sidonius: *Carmina*; *Panegyricus Anth.*, II, 245-248.

⁷⁷ Guignes; I, Pt. II, Liv. IV, p. 353. Cf. Theophanes, p. 378.

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however, relying apparently mainly on Marcellinus, openly declares that the Huns had deformed heads. He says: "The Huns produced upon the heads of their new-born children two distinct kinds of deformation. The first concerned the facial region. By means of tight linen compresses they caused the nose to be flattened and the cheek bones to protrude. The second was produced on the skull itself which was moulded in such a way as to elongate it causing it to attain a shape like a sugar-loaf."⁷⁸ It has been stated that coins of the period portray Attila with a pointed skull and diabolic features. Genuine coins, however, bearing Attila's portrait, are not known to exist, the medallions showing his head being mediæval. These represent Attila with sloping forehead and horns, it being a Gothic tradition that the Huns were demons with all those characteristics which we are accustomed to associate with the denizens of the nether regions.⁷⁹

We can now pass to Eastern Europe and before considering the macrocephalic skulls of the Crimea and Caucasus glance at possible examples of artificial deformation in Greece and the Balkans. Both G. della Porta⁸⁰ and Vesalius⁸¹ hint at the possibility of this in Turkey and Greece at the period (sixteenth century) in which they lived, but I know of little valid evidence for the custom in ancient times. Indeed the Greek idea of beauty disdained any artificial bodily deformities and some light is thrown upon the question of a deformed head by Homer's⁸² description of the head of Thersites, the insolent talker of Troy. "His head was warped," the poet wrote, "and scanty hairs grew thereon." Similarly, Pericles is said to have suffered from a slight cranial deformity, namely, an elongated head, and this was a subject for great ridicule among the comic poets. In Plutarch, Pericles' head is compared to a squill and therefore may be thought to have been dome-shaped rather than elongated backwards. Apart from ancient Greek

⁷⁸ Thierry, p. 241. ⁷⁹ Cf. Schönwiesner: Taf. 1, figs. 3, 4; Babelon.

⁸⁰ G. B. della Porta, Lib. II, 77.

⁸¹ Vesalius, I, 5. "Genuensium namque, et magis adhuc Græcorum et Turcarum capita globi fere imaginem exprimunt, ad hanc quoque (quam illorum non pauci elegantem, et capitis quibus varie utuntur tegumentis accomodum censent) obstetricibus nonnunquam magna matrum solitudine opem ferentibus."

⁸² Homer, II, p. 218; Cf. Regnault, 8.

skulls,⁸³ however, certain discoveries have been made in this region of Europe. In Constanta, Pittard⁸⁴ reported in 1900 the finding among sixty normal skulls of two macrocephalic deformed crania of uncertain date of the same type as those of the Danube valley and elsewhere. Of the two skulls only one was complete, with the exception of the lower jaw. The other had only part of the face and the frontal bone, the condition of the latter clearly revealing the fact that it had been subjected to deformation. The deformation had apparently been effected as usual by one or more constricting bandages, which passing over the frontal region joined near theinion.⁸⁵ Indeed it would seem certain that two bandages have been used, an inio-frontal and an inio-bregmatic bandage. The perfect specimen shows a pronounced depression posterior to the coronal suture which causes the skull to assume a shape similar to that seen in cases of klinocephaly. The forehead appears flattened and thrust backwards, whilst the lower part of the frontal bone is curved outwards to a slight extent, but there is no metopic suture. The bandages have evidently been unequally applied for plagiocephaly is very apparent and the skull originally seems to have been dolichocephalic, the C.I. being 73.82. In the case of the second skull the existence of only a small part, lacking as it does the entire occipital region, does not help us to gain any clear idea of its original shape.⁸⁶ Similarly another skull with fronto-occipital compression of an almost extreme type was discovered at Erenkeui, south-west of Bigha, near the Dardanelles, and although in Asia Minor is included here for comparative purposes. The date is very uncertain, possibly Byzantine, and the skull is thought by Weisbach⁸⁷ to have belonged to an Armenian. But perhaps the most remarkable of all the South Eastern European skulls are those found by Mr. Dudley Buxton in Crete which he dates as probably not earlier than Late Minoan III. At the time of writing Mr. Buxton has not reported on these, and I owe my being allowed to inspect them in April, 1928, to his courtesy. Two distinct forms of deformation are apparent; one a simple,

⁸³ See Plutarch, Pericles 3; III, p. 81. "σχῖνοκέφαλος." The phrase also used, κεφαληγέρτης (head-collector), probably indicates size. Cf. Cratinus, *Χείρων*, III and Girard, 96-97, and also Deonna 1, who says that the Greeks ridiculed sugar-loaf heads (II, 410). Cf. also I, 215; II, 122, &c.

⁸⁴ Pittard, 1.

⁸⁵ Pittard, 1, p. 620.

⁸⁶ Istrati.

⁸⁷ Weisbach, 2.

but very pronounced occipital flattening as if the result of pressure from a cradle-board; and the other a very curious flattening of the top of the head as if produced by the inner surface of the top end of the cradle pressing tightly against the crown of the head. Mr. Buxton's report will be awaited with interest, and I shall not add here any details of these skulls.

We can now pass to the most important centre in Europe where these artificially-deformed skulls have been found. If we glance at a map of Russia we notice that towards the south-east, flanking the eastern shore of the Black Sea and the western shore of the Caspian, is the region of the mountainous Caucasus with its rich mineral deposits. To the west the Crimea juts out into the Black Sea, whilst in the Caucasus, after rising into a series of belts or mountainous chains which stretch across the country, the land shades off into flat territory extending northwards across Astrakhan and the basin of the Volga. Roughly speaking, the district bounded on the south by the river Aras, on the west by the lower reaches of the Dniester, on the north by the plains south of Samara and on the east perhaps by a stretch of land a few hundred miles east of the Volga, is that region where the richest finds of artificially-deformed skulls have been unearthed. Certain districts, as we shall see later, are richer than others, perhaps owing to more systematic and industrious local excavation. But as far as our knowledge exists at present, the sites around Kertch (the ancient Panticapæum), Tiflis and Rostov are the most important areas to be discussed. The early history of south-east Russia is not easy to determine with any degree of accuracy. Let us glance again at the map. It will at once be observed that this region lies just where it would be assailed by influences from all points of the compass. Oriental influence poured into European lands across the Steppes; Greek influence and sea-going traffic passed northward to the Greek colonies and Taurica Chersonesus; the great Danube trade routes on the west let wanderers off the beaten track pass to the eastward, and the nomadic hordes found here a temporary place of sojourn, only to be displaced later by other and more active peoples. The Caucasus absorbed foreign influence from all quarters and acted as a diffusion centre from which customs spread, possibly to a far greater distance than has hitherto been supposed.

Little is known of prehistoric southern Russia prior to the advent of the Scythians. Polished stone celts and axe hammers have been recovered, it is true, from certain regions, and in alleged neolithic sites pottery and spindle whorls have been found, contact with other parts of Europe being clear from the productions of some of these cultures. The Kurgans, which seem in some way to be connected with the occurrence of microliths, do not appear to be of the same date, and some of the finds show strong Mesopotamian affinities. The burials contain dolichocephalic skeletons, and the remains of animals often interred with them suggest that the former are those of pastoral nomads.⁸⁸

It is thought that from about the eighth to the third century B.C. the country was ruled by the Scythians, who may previously have conquered the obscure Cimmerians who had settled around Kertch and the adjacent regions. The latter seemed to have moved into Asia Minor about 708 B.C., and the Scythians appear in Assyrian records about 738 B.C.⁸⁹ From the third century onwards for perhaps two hundred years the Sarmatians came westward, and when settled continued, to a certain extent at least, a Scythian mode of living, and retained some forms of Scythian art, which itself had been considerably influenced by Iranian motives. The most brilliant period in the early history of south Russia seems to have been between the fourth and third centuries B.C.⁹⁰ The Scythians were a great trading people: commerce by road and sea flourished and with it a spread of goods, customs and ideas. South Russia became a mart for East and West, just as Warsaw remains to-day an outpost of European and Oriental trade. With the decline of the Sarmatian period Gothic influence began to be felt. Huns displaced the Goths and a medley of peoples—Gothic, Iranian and East Asiatic—met and mingled. Finally the brachycephalic eastern Alpo-Carpathians or Slavs settled and remained after a great deal of admixture had doubtless taken place. To-day the Caucasus presents a population of numerous peoples which it is hopeless to try to disentangle completely. Only certain broad divisions can be recognized, and among these we shall see as we proceed

⁸⁸ See Rostovtzeff: Ebert: Childe, 1: Anutschin, 3. Tallgren, p. 30.

⁸⁹ See Minns, 2, p. 188.

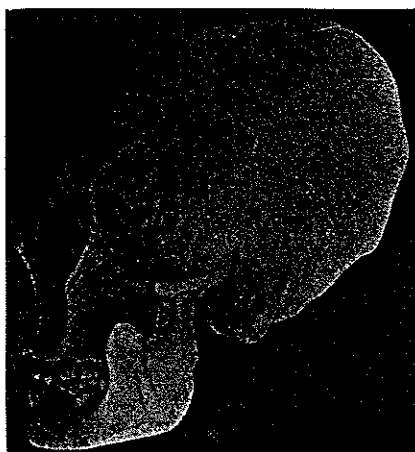
⁹⁰ Rostovtzeff, p. 213.



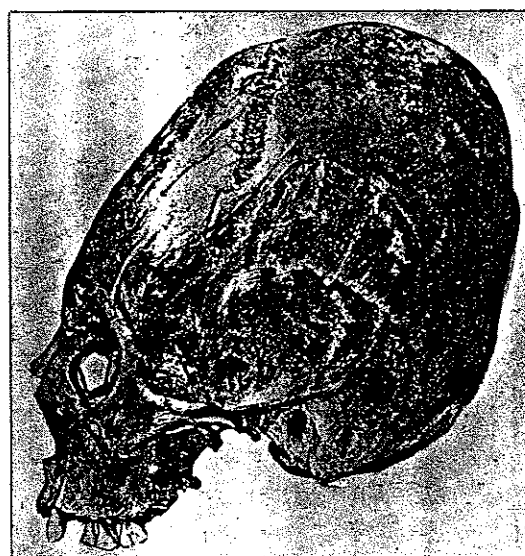
After *a* Lenhossék.
The Ó-Szőny Skull.



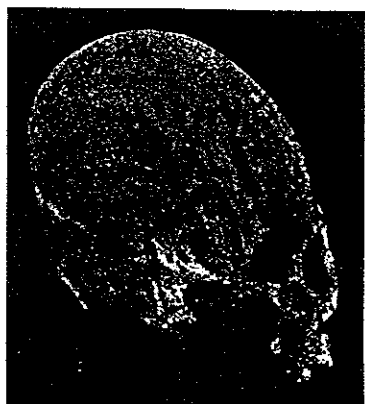
After *b* Lenhossék.
The Ó-Szőny Skull.



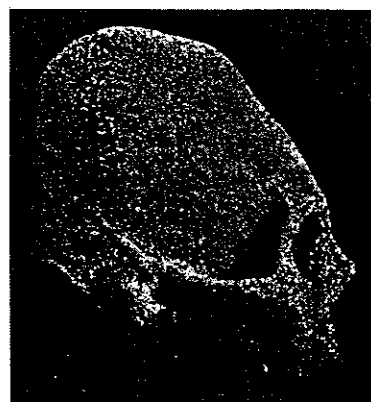
After *c* McCurdy.
"Aymara" Deformation.



After *d* Lenhossék.
The Czongrad Skull.



After *e* Anutschin.
A Baksan Skull.



After *f* Anutschin.
A Kertch Skull.

that the practice of artificial cranial deformation has by no means entirely died out. Before examining the evidence for the more ancient deposits it may be as well to say something at first of certain obscure references in the older writers to peoples living in this region who are known by such names as Macrocephali, Macrones, Sigynnes,⁹¹ &c. Strabo mentions a people called the Sigynnes in his *Geography*, and the same group finds a place in Herodotus. They seem to have been a non-Scythian, Trans-Danubian people, and it is possible that the name was used for a conglomeration of different peoples. Strabo declares that they made a point of making their heads appear as long as possible with their foreheads projecting over their chins.⁹² Hippocrates, in his *De Aere, Locis et Aquis*, has an important passage on the Macrocephali.⁹³ He says: "I will pass over the small differences among the natives, but will now treat of such as are great either from nature or custom; and, first, concerning the Macrocephali. There is no other race of men which have heads in the least resembling theirs. At first, usage was the principal cause of the length of their head, but now nature co-operates with usage. They think those the most noble who have the longest heads. It is thus with regard to the usage: immediately after the child is born, and while its head is still tender, they fashion it with their hands, and constrain it to assume a lengthened shape by applying bandages and other suitable contrivances whereby the spherical form of the head is destroyed, and it is made to increase in length."⁹⁴

Hippocrates then continues by a discourse on the probability that parents who had artificially elongated their heads would have children with naturally elongated skulls, a digression into the question of the inheritance of acquired characteristics where we need not follow him. From this strange custom of elongating the head the people were called the Macrocephali (*μακροκέφαλος* = long-headed), from which the anatomical term macrocephalic was of course derived.

⁹¹ Σιγύννες; Σιγύννοι, &c.

⁹² Strabo, Lib. XI, cap. XI, 8; vol. i, p. 446. Cf. Bertrand, Török 3.

⁹³ Hippocrates 1, vol. I, p. 550. Sir J. J. Frazer thinks they may be the same as the Syrakoi of Zenobius who are reported as giving the crown to the man with the longest head. See Frazer, vol. II, 247, and Zenobius, Cent., V, 25, vol. I, p. 126.

⁹⁴ Hippocrates, 2, Sect. 14, pp. 207-209.

Pliny⁹⁵ speaks of a people so called in the north-east of Pontus, and the Greek geographer, Scylax of Caryanda,⁹⁶ who may have been the author of the *Periplus*, has a note on the people of the same name. Similarly the Roman geographical writer, Pomponius Mela,⁹⁷ who flourished about A.D. 50, and who makes mention of the Macrocephali, remarks that they were less fierce than their neighbours although "inconditis moribus." Minns⁹⁸ does not seem to have much to say as to the anthropological and linguistic affinities of the Macrocephali, and we do not know if they were the same people as the Macrones (Μάκρωνες), who were supposed to live to the east of Pontus. A number of classical writers mention them by name, including Josephus,⁹⁹ who adds the interesting information that they practised circumcision. From what the ancient authors have observed it is clear that our information is exceedingly meagre. One fact, however, emerges from the scanty notes that they have left. It would seem that in the time of Hippocrates, who died about 350 B.C., there were living in the Caucasian region peoples who artificially deformed their heads by elongating them, and that this deformation was considered a mark of nobility and aristocratic breeding—*longissima enim habentes capita generosissimos existimant*. I suggest that this is a fact because in the course of our inquiry we shall find that the Macrocephali were not alone in this idea; that peoples widely separated both in time and space believed that artificial cranial deformation was a practice to be confined to the few, a custom which men of low birth had no right to practise.

We can now turn to the actual cranial material. One of the earliest notes on the skulls from Kertch was that by Blumenbach,¹⁰⁰ who in 1833 mentioned a specimen he had obtained from Stepan. Six years later Dubois de Montpéroux¹⁰¹ in his account of the Caucasus mentioned deformation, and in 1843 Rathke¹⁰² published an article on the macrocephalic skulls from Kertch, followed in 1849 by Aschik,¹⁰³ and in 1850

⁹⁵ Plinius Secundus VI, 4; vol. I, p. 218.

⁹⁶ Scylax of Caryanda, p. 213.

⁹⁷ Mela, I, 19, p. 619.

⁹⁸ Minns I, p. 47, note 4.

⁹⁹ Josephus, *Contra Apionem*, Lib. I, 22; vol. II, p. 353.

¹⁰⁰ Blumenbach, R., p. 1761, 177 Stück.

¹⁰¹ Montpéroux.

¹⁰² Rathke.

¹⁰³ Aschik. Cf. Baer, 2, who partially translates Aschik's remarks (pp. 2 ff.) and McPherson, who discusses his excavations (p. 37).

by Meyer,¹⁰⁴ who reported on the frontal bone of a macrocephalic skull from the same place. It was not until 1887 that the first general account of the Russian artificially deformed skulls was published. In that year the Russian naturalist, D. N. Anutschin,¹⁰⁵ published a paper in which he gave a fairly full account of the discoveries of such crania up to the time at which he wrote. I am indebted to Mr. B. Uvarov for translating such relevant parts of his paper as seemed to us of value, and I will here present a summary of his remarks.

In 1867 at the Moscow Ethnographical Exhibition two deformed skulls found by P. M. Leontiev in burial mounds near the mouth of the Don were shown, and in 1879 the Moscow Society of the Friends of Natural History received one typical macrocephalic skull from I. N. Shatilov, in Kertch, and several from both Kertch and Inkerman, sent by Selivanov. In 1884, at the sixth Archæological Congress at Odessa, five deformed skulls were on exhibition, and later further finds were brought to light at Kertch and some presented to the Moscow Anthropological Museum and the Anatomical Museum of Moscow University. Later more artificially deformed skulls were found by Bayern, near Tiflis (Mtskhét), by Miller in graves on the Baksan, and by Krylov in a burial mound at Iljinskaya.

Similarly further discoveries were made as far apart as Rostov and Samara, and thus the area of distribution of deformed macrocephalic skulls in Russia was proved to extend from the Crimea to the middle Volga, and from Samara to Transcaucasia.¹⁰⁶

Of the groups of artificially-deformed skulls found in Russia those derived from Kertch present the most extreme and typical deformation.¹⁰⁷ Anutschin notes that of these he studied over ten examples, and is of the opinion that after the Peruvian specimens the Kertch skulls show the most marked changes from the natural shape inasmuch as the frontal region is depressed and the whole head elongated backwards and upwards. This depression and elongation was

¹⁰⁴ Meyer, C., 1 and 2.

¹⁰⁵ Anutschin 1. Cf. a later general description in Andreevsky.

¹⁰⁶ Anutschin, 1, p. 37.

¹⁰⁷ A skull found at Sipovo (left bank of the Derkul) is said to resemble specimens found at Kertch: see Maslovski.

obviously attained by applying to the infant's head both tight bandages and also perhaps wooden boards, traces of pressure being usually distinct. It would seem that one bandage, about two to three inches wide encircled the head from the frontal bone to the occiput, passing a little above the occipital protuberance. In certain cases slight concavities appeared on those places immediately under the bandage both in front and behind. These concavities or depressions are usually noticeable, and can best be observed when the skull is viewed in *norma lateralis*. One often appears on the frontal bone and others can sometimes be observed either immediately above the occipital protuberance or somewhat higher. The influence of the circular bandage, however, did not stop there. By encircling the skull like a tight ring it prevented it from increasing longitudinally and forced an upward growth. This impediment to growth in a horizontal direction finds expression in the reduction of the horizontal circumference, and particularly in the reduction of the longitudinal diameter of the skull when measured from the glabella to the occipital protuberance. The horizontal circumference of the seven deformed skulls from Kertch was considerably less than that of other non-deformed skulls found on the same site.

One circular bandage, however, would not alone be able to produce the type of deformation seen in these macrocephalic skulls. This bandage merely made the circumference of the skull rounder and increased its height; it could not produce that elongated shape upwards and backwards which is so striking a peculiarity of the more typical of the macrocephalic specimens from Kertch. In order to obtain this shape, a second, and sometimes even a third bandage were necessary, and their traces are, in most cases, perceptible. The second bandage was placed almost perpendicularly to the first, across the crown of the head, or rather, over that part of the head just behind bregma, or even along the coronal suture. It appears to have been as broad, or even broader than the first bandage, and may have passed below the chin or just beneath the occipital protuberance. The result was that the region behind the second bandage became the portion of the skull where compensatory growth could most easily occur, and it was here that the skull protruded upwards and backwards. The deeper the concavities or depressions were the sharper were the compensating protrusions, and occasionally quite deep grooves were produced. In order to

elongate the head still further upwards and backwards a third bandage was occasionally applied. In some skulls traces of it may be seen just above lambda or across the posterior portion of the sagittal suture. The second and third bandages may have been united with the first bandage, but at any rate in order to keep the transverse bandages in position they were joined possibly by another longitudinal bandage which exercised some pressure along the crown of the head. This is suggested by the slight longitudinal groove or depression upon the top of the skull which is often clearly visible when the skull is viewed from normal occipitalis.

The general shape of the deformed skulls from Kertch can be defined as follows. The frontal region is depressed and slopes backward and a slight transverse depression is often to be observed. The crown of the head rises upwards and backwards and, seen in *norma lateralis*, it appears separated from the frontal region and sometimes from the occiput, by small depressions followed by small convexities. The occipital region is also depressed, and seen in *norma occipitalis* the skull is high and almost quadrangular in shape. The height of the skull finds expression in the vertical diameter exceeding more or less considerably the greatest transverse diameter, and the elongation of the skull in the vertical direction is usually accompanied by the elongation of its direction taken horizontally. The depression of the frontal region causes a shifting backwards of bregma and the coronal suture becomes more oblique extending both backwards and upwards. Another result of this compression is seen occasionally in the convexity of the region around pterion, which is normally flatter than is the case in the deformed skulls.

The bandages were undoubtedly applied in infancy, and it might be imagined that discoveries of the skulls of children would sometimes be made, as a considerable percentage of children never attain adult age. These are, however, rare in the Crimea, although some have been reported and are known among local antiquarians as microcephals. All the skulls examined by Anutschin were those of adults from thirty to sixty years old, the teeth being fairly well preserved and the sutures partly fused. The sex of the skulls cannot be determined with any certainty. According to the usual standards of judging, the proportion of the sexes seems to be evenly maintained, and it cannot be said that the male outnumber

the female, or *vice-versa*. Anutschin is not in agreement with those authors who seek an Avar origin for these deformed crania, and he is not able to come to any definite conclusion as to their nationality.¹⁰⁸ As to the age of the Crimean deformed skulls, it would seem that they cannot be placed earlier than the beginning of the Middle Ages. Greek objects are not found in the tombs where deformed skulls have been discovered, and the grave goods are usually of rude manufacture, the pottery being poor in design and workmanship. Certain curious phallic statuettes found in the catacombs of Kertch have sloping foreheads which are suggestive of deformation, but the forms are too rough to admit of any degree of certainty. That two forms of deformation were known in South Russia is clear from the discoveries at Bia-Sala, the skulls from which site being exhibited at the sixth Archæological Congress at Odessa in 1884.¹⁰⁹ On some of the skulls, fragments of skin remained as well as hairs, fabric and metallic ornaments, such as bronze ear-rings and large bronze pins, together with chains made of ringlets. With the majority of the skulls the frontal region was depressed, as also was the occiput; all the skulls from this site when viewed from *norma verticalis* appeared asymmetrical, the plagiocephaly being in some cases strongly marked. In the Crimean macrocephals the skulls are generally symmetrical, and their deformation was attained, as we have seen, by bandaging the head both in a circular direction and transversely. The skulls from Bia-Sala were subjected, apparently, to pressure upon the occiput as well as to the circular bandage. This was probably the result of the use of the cradle board, the asymmetry being caused by the head not always resting squarely upon the occiput. The transverse depression seen upon the Crimean examples is absent upon the Bia-Sala specimens, this fact sharply differentiating them from the former.

At the exhibition they were described as coming from a Gothic cemetery, although this seems doubtful as the tombs may have been those of Taurian Greeks.¹¹⁰ In the Samthavro cemetery cases of deformation reached about 25 per cent., or perhaps less, and taken as a whole they do not present such strong evidence of bandaging as the Kertch specimens.¹¹¹ How-

¹⁰⁸ Anutschin, 1, pp. 372 ff.

¹¹⁰ Anutschin, 1, p. 385.

¹⁰⁹ Anutschin, 1, p. 380.

¹¹¹ Cf. Chantre, 5, II, p. 122.

ever, on some of the better preserved examples a distinct depression of the frontal and occipital regions is perceptible, which indicates the horizontal bandage, whilst a depression upon the crown suggests the transverse bandage. More commonly a depression of the frontal region only is found; sometimes the crown alone is seen to be flattened. As regards the sex, both male and female skulls are deformed, and the remains are found in stone sarcophagi and in the more ancient graves. In their type the Samthavro skulls exhibit some considerable variety. They are mainly dolichocephalic, and a C.I. of over 77 is rare. Leptorrhina is usual, the orbits somewhat high and the muscle attachments mostly feebly marked. From this burial ground the skulls may be said to date from any time between the sixth century B.C. and the sixth century A.D., and similar finds are reported near by, as, for example, from Marienfeld. From the river Baksan, V. F. Miller obtained four skulls which were very remarkable for their unusual height and elongated appearance both in an upward and backward direction. (See Pl. I, *e*.) Some were taken from a cemetery near the village of Urusbii. Here were stone-lined graves, each containing three or four skeletons, together with bronze rings and some pottery. Others came from Otluk-Kala (Gundelen), where grave vaults were discovered and iron and bronze objects were recovered, together with the skeletons. All the skulls here belonged to aged persons; two lacked all the teeth in the upper jaw (the lower was missing), and the sutures also indicated old age. The sex is uncertain, but as far as can be seen it would appear that the majority was female. In all, the frontal region is retreating and somewhat concave; the occiput high and flattened; and on the crown a depression is visible. In every case pressure seems to have been exercised by horizontal and transverse bandages, of which the first seems to have been especially important. The general shape differs from that common among the Crimean macrocephals. The original form was more inclined to brachycephaly, and as regards the method of deformation it is probable that the bandages were broader, especially that one used for the horizontal constriction.¹¹²

Similarly in the basins of the Don and Volga macrocephalic skulls have been found. Leontiev found them in burial

¹¹² Anutschin, 1, p. 391.

mounds in the lower courses of the Don, and Krylov discovered another specimen in Ilinka on the river Sal. The skull found by Leontiev does not present such projection upwards and backwards as is seen in the typical examples from Kertch (see Pl. I, *f*). It is male, and the deformation has been effected by horizontal and transverse bandages of which the latter were the broader and the less tight. It is mesocephalic and differs from the one found at Ilinka on account of its size. This latter skull was the largest of all the macrocephalic specimens measured by Anutschin. It was undoubtedly male with strongly developed eyebrow ridges and occipital torus. The deformation was similar to the preceding, but perhaps not quite so pronounced. Again another skull was found in a mound at Kriaje, near Samara.¹¹³ Accompanying the skeleton was a horse, an iron sword and a thick ear-ring, and the deformation resembles that found on the specimens from Kertch. The frontal region is retreating and concave; just posterior to bregma is a sharply-pronounced depression; and the occiput is high and flattened with a depression just above lambda. Judging from the small circumference, feebly-developed eyebrow ridges and general condition, the skull is female, and from the condition of the teeth and sutures is of middle age.

It may be as well if we sum up the evidence from South Russia, giving the references which have been omitted from the areas concerned. Bayern's excavations at Mtskhet laid the foundations for much discussion upon the Samthavro discoveries. His own account was published in 1872¹¹⁴ being reviewed by Much two years later.¹¹⁵ Smirnow then summed up clearly the information concerning the finds at Samthavro in a paper in 1877,¹¹⁶ in which he pointed out that the examples of deformed skulls were all found in stone-slabbed graves.¹¹⁷ This indicated perhaps that the bodies found beneath the stone slabs were those of the more important members of the community, a fact insisted upon by Fritsch¹¹⁸ in his consideration of these discoveries together with those of Kertch where he notes the skulls were dolichocephalic. With regard to the tombs at Samthavro there would appear to have been four

¹¹³ Anutschin, 1, p. 396.

¹¹⁵ Much, 1.

¹¹⁷ Smirnow, p. 542.

¹¹⁴ Bayern.

¹¹⁶ Smirnow. Cf. Scephura.

¹¹⁸ Fritsch, 1. Cf. pp. 151, 152.

types of burials of which the majority were graves covered with rude slabs of stone.¹¹⁹

The greater part of the graves at Mtskheth contained pottery, ornaments, bracelets, fibulae and some bronze daggers. Some of the objects seemed identical with the finds at Kasbek and Koban where macrocephalic skulls do not appear to have been reported.¹²⁰ Of the crania which are mostly in a poor state of preservation the oldest specimens would seem to be dolichocephalic, but unfortunately the graves show evidence of having been disturbed by tomb robbers in early times and it is only in the lower strata that deformed skulls occur.¹²¹ Similar tombs, where fibulae, bracelets and ornaments with swastika designs were found, exist at Kasbek¹²² and here bronze objects including animal heads have been discovered. Here too deformed skulls have been found as also at Kumbulte, Digor, where an example shows the frontal bone much flattened in a backward direction.¹²³ Macrocephalic skulls have also been discovered in the neighbourhood of Tiflis when in 1871, a new road was being constructed to Vladikavkaz,¹²⁴ a mile from Mtskheth. Here ornaments of gold, bronze, iron, ivory and pearl were discovered together with a silver vase of Grecian workmanship. The excavations at Mtskheth provided a series of deformed skulls of all the same type. Seen in profile and from norma lateralis they exhibit a depression of the frontal bone curving towards bregma, and a second depression anterior to the coronal suture. Thus the use of a couple of bandages is suggested as in the Danubian skulls, one being passed behind the head below the nape and over the forehead, and the other passing over the crown so as to elongate the head in a backward direction.¹²⁵

On the western side of the Crimea near the site of the ancient Chersonesus, Kosciuczko has conducted some excavations which have yielded deformed skulls. Of these examples numbering six or seven, three were found in a catacomb roughly constructed and sealed by a sticky clay. Three others were found in tombs situated near one another and in the same

¹¹⁹ Chantre, 2, p. 248.

¹²⁰ Virchow, 9, p. 478. Chantre, 6.

¹²¹ Many of the tombs contain more than one skeleton, but rarely are they complete so great has been the disorder. See Chantre, 3, p. 836.

¹²² Chantre, 2, p. 252.

¹²³ Virchow, 15, p. 422 : Erckert.

¹²⁴ Telfer. Cf. Radde, 2.

¹²⁵ Cf. Broca, 5, pp. 573-576.

series as some Greek tombs of the Roman period dating from the second and third centuries A.D. Among the objects found near the deformed skulls there were three pairs of gold ear-ornaments in the form of rings adorned with pendants with fourteen facets. A buckle had also been gilded and its facets were incrustated with oriental conical garnets.

The discovery of another skull presented some curious problems as to date. A bridge over the Don was being constructed, and a skull, lacking the facial portion, was discovered 6 metres below the level of the river bed, of which the depth at that point reached some 10 metres. It is clearly deformed although less markedly than the specimens from Kertch. Now if we suppose that the skull has been gradually covered by the raising of the river bed this would give a hoary antiquity to the relic, but it seems to me probable that this supposition can hardly be sustained, since we do not know whether at one time or another a large amount of deposit was brought down owing to storms or earth movements. According to Anutschin¹²⁶ there is the possibility that the skull is at least 1,200 years old, although we cannot pretend to be convinced by the validity of the arguments upon which he bases this conclusion.

We are now in a position to review briefly the facts analysed in the preceding pages and to attempt a summing up of the available evidence. We have seen how wide is the distribution of deformed skulls in Europe. The oldest specimens would seem to come from the Caucasus, and the dating here is uncertain, but may perhaps be held to be some 500 years prior to the Christian era. The later examples, and more especially the crania from the German "Reihengräber" are all mediæval, some dating possibly from the Early Middle Ages, but the majority to later periods.¹²⁷ I do not think that it is possible to determine the nationalities to which these people belonged. The Avar theory formerly sponsored by Baer¹²⁸ and Fitzinger¹²⁹ cannot be said to be satisfactory, and is certainly erroneous when applied indiscriminately.¹³⁰ The

¹²⁶ Anutschin, 2, p. 267.

¹²⁷ The specimens from Lützen and Obermöllern have been dated as from the fifth or sixth century A.D. See Holter, p. 3, and cf. Niklasson.

¹²⁸ Baer, 2.

¹²⁹ Fitzinger, 1 and 2.

¹³⁰ Cf. Melgunov's paper on the nationality of the European macrocephals.

most that can be said would be, it seems, that these skulls belonged to some of the many peoples who wandered through Europe: that the deformation was likely to have been a mark of aristocratic lineage; and that the practice would seem to have been carried to the Caucasus from the east or south, and from there brought up the valleys, or by a coastal route to other lands. It would also seem probable that in many cases the deformation was voluntary and intentional¹³¹ and had a definite purpose in view, although we must bear in mind the possibility of the unintentional factor when considering certain forms of head-dress and the influence of pathological conditions.

We can now pass on to a consideration of cranial deformation in Modern Europe. Here many difficulties are to be encountered. We shall have to try to decide if the modern method of cranial deformation is intentional or unintentional, and if either the one or the other, how the custom originated and why it persisted. On the other hand, perhaps it may be that the custom was once intentional, and, its original meaning being lost, it became merely a practice based on tradition, rationalization supplying a new interpretation to fit the facts. Such phenomena are common. No one supposes the modern Christian circumcises his children for ritual purposes, nor wears ear-rings for the reason that the first ear-pendant was worn. We circumcise for "hygienic" reasons, and we wear ear-rings because they are "beautiful." As an old lady is reported to have said, "ear-rings do dress a thin female's face so nicely."¹³² Ritual perforation is forgotten: æsthetic ideals supply its place and the ear is pierced, not for the purpose of drawing blood or for inserting an amulet, but simply for the purpose of suspending an ornament. So it may well be with head deformation. Tradition dies hard and so do aspirations after aristocratic ancestry. Memories of ancient customs are hidden away in remote corners among peasant communities. Gossipy midwives carry on the lore of the past.¹³³ It may be in such reflections as these that we shall be able to glimpse the meaning of much that will perplex and baffle us in the course of our tedious inquiry.

¹³¹ But see Giuffrida Ruggeri, 1, on this question, who criticizes Schliz, and seems to think that the bandages may have been used for restraining the hair (p. 316).

¹³² *Star*, June 14, 1927.

¹³³ Cabanès suggests that head-deformation was carried on in France as late as 1925, but it would seem he has little evidence for this assertion. See Cabanès, 2, p. 127.