CHAPTER II

LATER ARTIFICIAL CRANIAL DEFORMATION IN EUROPE

If we begin by looking at the rough distribution map (see Map 2) we shall notice immediately that the chief centre of deformation is in France. In northern Europe there are a few areas where cranial distortion occurs, and in Central Europe a belt stretches across from France to the western confines of Russia. In southern and south-east Europe there are but a few areas indicated, whilst in the Caucasus there still exists a region which was made familiar to us from our consideration of the older stations. We may well begin with France and examine the evidence we possess of the practice as it has been observed in modern times.

We have seen how some of the sixteenth and seventeenth century authors mentioned the moulding of infants' heads in the northern parts of France. Blumenbach\(^1\) was aware of it in the eighteenth century, but it was much later before any detailed studies were made. On examining the literature it is surprising to find what a wide distribution the practice has in France. Glance again at the distribution map. With the exception of a narrow belt of land north and south of the Loire and a corner or two like those in Basses-Pyrénées and Gironde, the custom seems almost universal. Certainly some regions, notably Seine-Inférieure, Deux-Sèvres, Haute-Vienne, Creuse, Tarn, Haute-Garonne and Aude show a larger proportion of cases than others, but generally speaking the practice seems to have been known in the majority of the departments. Not only was the custom widely distributed, but also the resulting distortions are so characteristic that it has been suggested that certain forms might serve as marks of identity in persons from certain districts.\(^2\) Delisle himself personally

\(^{1}\) Blumenbach, I, p. 60.  \(^{2}\) Lagneau, 3.
Child wearing a "Bandeau."

Deformed Head due to Bandaging.

Deformed Head due to Bandaging.
Map II

MAP SHOWING APPROXIMATELY, DISTRIBUTION OF CRANIAL DEFORMATION IN EUROPE.
inspected about 25,000 cases, although he did not visit the prisons during his tour of the public institutions.\(^6\)

We may begin our survey of the field by an examination of the cases of cranial deformation in the northern part of France, and we cannot do better than by considering the opinions of Achille Foville, who at one time was a medical attendant at the great asylum at Saint-Yon. In 1834 this writer published a small book\(^4\) on the cranial deformations he had observed in the course of his practice; these, he thought, were due to the influence of tight head-gear and bandages. In 1829, according to this author, the commonest form of head deformation was a narrowing of the skull, following a line which, starting from the superior part of the frontal bone terminated below the occipital protuberance, whilst passing over the ear on either side. According to Foville this was caused by the constricting bandeau which was worn by children at this period over their heads. (See Pl. II, a.) The resulting deformation consists roughly of a circular depression which commences from the upper part of the frontal region where it is at its greatest breadth. From there it is diverted obliquely downwards and backwards, passes the ears and then continues to meet the nape of the neck.\(^5\) The forehead is, therefore, prevented from upward growth, the skull flattened in its upper part extends behind like a segment of a cone or cylinder of variable diameter. This custom of wearing a bandeau was widely spread in France.\(^6\) It consisted broadly of attaching to the head of the new-born child a linen bandage to the ends of which ribbons were sewn. Indications of the bandage are furnished, not only by the depression on the skull, but also by the deformation of the ear which accompanied it (see Pl. II b). This occurred in the great majority of cases and we shall see later how the same custom had a precisely similar effect in North Africa. We shall see later also how the midwives of the past moulded and tied up the heads of new-born children. In the meanwhile it may be of interest to glance at a few statistics Foville drew up in order to indicate the extent of artificial cranial deformation at the time at which he wrote. At a public asylum in Seine-Inférieure during the year 1833, 431 inmates were under the care of the institution, 202 men and 229 women. Ninety-three

\(^{a}\) Delisle, 4. \(^{b}\) Delisle, 1. \(^{c}\) Foville.  
\(^{d}\) Foville. p. 15. \(^{e}\) Foville, 29. \(^{f}\) Cf. Ranke, 1, vol i, p. 191.
men were deformed of which 46 exhibited the distortion to a
pronounced extent, and in 11 the deformation was extreme.
Among the females 154 had deformed heads of which 40 showed
an extreme deformation. Thus among the 431 persons, 247
were deformed or more than 50 per cent. Another point
mentioned by Foville is that it was among the more intractable
and difficult patients that the extreme forms of deformation
were encountered, a fact which must be considered when the
possible influence of cranial deformation upon the mental,
moral and intellectual faculties is discussed.

It was not, however, only in the asylums that deformed
heads aroused disgust in medical witnesses. Morel, who
was Foville’s successor at Saint-Yon, mentions “les têtes
disgracieuses,” which were to be seen at public functions and
Rochet remarked that in both theatres and churches he had
noticed the shape of the bald heads among the people, and
thought that it was “très choquant.” (See Pl. II, c.) The
custom of wearing not only bandages but also serre-têtes,
béguins, &c., was widely spread in the nineteenth century in
France. Even in Brittany and Normandy it was known,
and in Eure, Calvados, Manche and part of Orne cases are
reported. Evidence is found in institutions in Rouen, Havre,
Dieppe, Bolbec, Saint-Valery-en-Caux and elsewhere. At
Lillebonne, Delisle himself saw an actual bandage in use, but
only 6 cm. in breadth. At the insane asylum at Quatre-
Mers the dispenser, who had lived since his youth in
Normandy, and who had seen the methods used for producing
cranial deformation, discussed these practices with Delisle.
Among the pieces of apparatus used were handkerchiefs, the
bandeau, and occasionally a band of cloth from 4 cm. to 5 cm.
wide and 2 m. or more in length which was tightly wound
round the head. The child often cried for hours under the
application of these constrictions without the parents realizing
the cause of the infant’s distress. The bandage was rarely
removed and consequently harboured thousands of lice which

1 Foville, p. 39.
2 Morel, p. 35.
3 See Histoire et dépenses, p. 120.
4 See Broca, 4, p. 121.
5 At the Marseilles meeting (1891) of the Association franq. pour l’ap. d.
6 sci., an old soldier described the bandages worn by children. See Royer,
p. 141.
7 Félix, p. 441. The Abbé Cochet also notes deformation in Normandy.
8 See Delisle, 6, p. 149.
9 Delisle, 6, p. 119.
contributed to the development of skin affections and suppurating ulcers. In the insane asylum of Saint Yon which contained 931 female patients 96 presented the different varieties of deformation. The inmates had come from the departments of Seine-Inférieure, Eure, Finistère, Pas-de-Calais, Somme, Oise and Meuse, the majority being from the first-named. Among the male patients of the Quatre-Mers (Seine-Inférieure) Asylum 78 out of 683 were deformed. Again, at the General Hospital at Rouen 31 per cent. of the females showed traces of deformation, these being taken from elderly people; and a similar result was found at Lillebonne where 8 out of 13 old men were deformed and 5 out of 12 old women. Taking Seine-Inférieure as a whole, Delisle found that 15.84 of the males and 10.33 per cent. of the females were deformed.

In Eure at the Navarre Asylum 12 men and 17 women were found to be deformed; and evidence from the Eure patients in Rouen suggests that deformation was not very common in that department except perhaps on its northern border. In Calvados an aged citizen of Bayeux described in detail to Delisle how the rolled cloth was used for the purposes of binding the head, but said that even at that time the custom was dying out. At Caen (Calvados) at the Asylum of the Good Saviour, only 28 persons showed marks of deformation out of a total of 1,048 whilst at Bayeux no clear case of deformation was observed, but only the effect on the scalp of the band used to fix the great Bayeux head-dresses or bavalettes. Thus in Eure and Calvados the custom appeared to be fast dying out. In Manche the custom was disappearing, few cases of deformation being observed, but a relic of the ancient custom may be of interest. At Pont l'Abbé-Picauville and the neighbourhood a tight bandage, locally called the crème was, up to recent times, affixed to the head of the new-born child. It remained on the head up till fifteen or twenty days after the baptism of the child, when it was removed and then again fixed in position and was usually retained until the child was able to walk without assistance. In ancient Normandy the department of Seine-Inférieure was that in which head deformation was the most widely spread, with the exception of the arrondissement of Neuchâtel-en-Bray. It was much less frequent in Eure and Calvados and rare in Manche.14

14 Delisle, 6, pp. 119-125.
In the region of Deux-Sèvres and Vienne it was much more frequent. Here, in Deux-Sèvres, with its Roman mining sites and megalithic monuments, cranial deformation was extremely common.\textsuperscript{15} At the asylum at Niort Lunier found 16 per cent. of the males and 47 per cent. of the females deformed; and in 1888 out of 100 mixed cases 33 were found in a similar condition. At Melle a case was noted of a female whose deformed head was due to a tight bonnet and not a bandage. The skull was narrowed transversely, at the same time being raised and elongated. The cap (fromage) was kept in position by a metallic ring which surrounded the rim of the head-dress.\textsuperscript{16} In Deux-Sèvres, where rickets is common, it was long the custom to surround the heads of infants with bandages, which, from the upper part of the forehead or anterior fontanelle were directed downwards and backwards, passing above the lobe of the ear and beneath the external occipital protuberance; then the two ends are brought together in front and fixed by a knot on the top of the head. Towards the second, third or fourth month the bandage was replaced by a sort of cardboard cap (calotte) serving the same purpose. Later a piece of metal wire (arcelet) was fitted inside the head-dress in order to give stability.\textsuperscript{17} The resulting deformation is most common in females and was thought at one time to be conducive to idiocy and epilepsy.\textsuperscript{18} The caps or béguins, which were also commonly worn were of a peculiar construction. The béguin itself was a head-dress formed out of a number of distinct parts, each ornamented and finished off separately. When put together they formed a kind of bonnet made of cardboard or of padded and quilted material. Sometimes in form it was like a helmet, and sometimes the base only was fitted with a framework of cardboard or with a coil of iron wire.\textsuperscript{19} In Poitiers itself in 1891 no cases of head deformation were observed in the insane asylum, but in an institution for old women four of the inmates showed traces out of a population of 120.\textsuperscript{20}

\textsuperscript{15} Lunier, 2, p. 327. This author is of opinion that the erotic sensibilities are increased by deformation, a view shared by others. See Lagneau, 2; Poznansky, 4.

\textsuperscript{16} Delisle, 6, pp. 126 ff. Sanson notes that the bonnets of Niort differ from those of Mols. The latter are called "fromages" in derision: their correct name is "pelleboises."

\textsuperscript{17} Lunier, 1, p. 45. Cf. Delisle, 2.

\textsuperscript{18} Lunier, 1, p. 56.

\textsuperscript{19} Gélin, p. 3.

\textsuperscript{20} Delisle, 6, p. 125.
MAP SHOWING THOSE DEPARTMENTS WHERE CRANIAL DEFORMATION IS REPORTED.

Areas thus shaded are regions where the practice has been especially prevalent.
We now pass southwards to Limousin, the province of ancient France which corresponded roughly to the greater half of Haute-Vienne, Corrèze, &c. The peculiar shape of the heads of certain of the inhabitants of Limousin was noticed in 1859, when Blanchard drew the attention of the Congrès scientifique de France to this fact. He spoke of the custom of wearing the "petit bonnet, des bandelettes artisement disposées et maintenues," and was inclined to believe that the deformations he had observed arose from its use. The result was to produce in the head a sugar-loaf form, and the aim of the practice was, in his opinion, to develop those parts of the brain which were supposed phrenologically to be concerned with intelligence and memory. It was, he says, a country custom, and the observation is decidedly pertinent. It must be remembered that in many parts of France urban mothers often did not nurse their children. The infants were boarded out with country women whose rural superstitions were practically applied. In his account of deformations observed in Limousin Freysselinard records the fact that, according to Bleyrie, the occipito-frontal diameter is diverted from the horizontal, its posterior extremity being very much raised. This elevation is even more noticeable when the diameter from the occiput to the mental process is taken. The skull seems more elongated and the upper part of the vault appears as a plane strongly inclined downwards and forwards. Two varieties of deformation are found. The one shows an exceedingly retracting forehead, whilst the other approaches more nearly the type known as déformation toulousaine. As is usually the case, deformation is found more commonly among women than among men, and Madame Rougerie, a midwife of Saint-Léonard (Haute-Vienne), reported that the infants wore certain tight caps for months at a time. That these caps must have been worn especially by women is seen from figures obtained from the Naugeat Asylum, where the proportion of women to men was about two to one. In Limoges the hospital contained 120 beds in which 44 patients were found deformed, and among

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22 Blanchard, 1, p. 198.
23 Freysselinard, p. 4.
24 Freysselinard, p. 37.
26 Freysselinard, p. 57.
27 Delisle, 6, p. 129.
the old people the deformation was the most frequent and the most noticeable: Indeed, some of the women still wore the *barbichet*, a part of that head-dress commonly adopted in the district. 28 In Corrèze the deformations particularly associated with Limousin were not very common, but examples in females were found in Brives, Uzerches and elsewhere. Similar cases were to be met with in Indre and Cher, and in Dordogne a few examples were still to be found among the oldest people at the beginning of the twentieth century. In Charente deformation was formerly practised, a roll of cloth being wound round the head in order to elongate it. 29 It is, however, in Languedoc that a more important area of cranial deformation is found. Here in the departments of Tarn, Haute-Garonne, Aude, &c., a deformation was practised, which, because of its frequency, became known as the *déformation toulousaine*. In Tarn, Berenguier condemned the practice, giving as a reason for its continuance that it was admired and the result considered beautiful by *grisettes*. He says that the deformation was caused by vicious practices carried on throughout Haut-Languedoc. The head is much elongated from in front backwards and from below upwards, giving to the occiput a "proéminence tout-à-fait disgracieuse." This abnormal form of the skull among the inhabitants of Rabastens was the result, according to Berenguier, of the circular pressure to which mothers and nurses submitted the heads of new-born children by means of a bandage. This author states that he was the means of preventing the practice among certain families, and he condemns it as being the cause of grave troubles, the nature of which he does not specify. Besides the deformation of the skull he also mentions the distortion of the ear to which Foville had drawn attention in cases from Seine-Inférieure. 30 Similarly Coutèle, dealing with the neighbourhood of Albi, declares that the people of Albi have a very elongated head, and at the occiput a point is sometimes observed which in certain cases is quite sharp. It results, he says, from a circular compression caused by a bandage secured around the head of the new-born child, and he remarks, like Berenguier, that the abolition of the bandage has had remarkable results in some families. Moreover, he notes another

28 Delisle, 6, p. 130.
29 Berenguier, p. 95.
30 Delisle, 6, pp. 133 ff.
kind of deformation due to faulty posture, to which our attention will shortly be directed. Later inquiries confirmed the reports of Berenguier and Coutèle. The insane asylum of the Good Saviour and the hospital at Albi were investigated by Delisle nearly fifty years later, and both contained examples of cranial deformation. The cagnotte is worn among the people of Albi, and in Tarn deformation can be observed among the old people, and, as usual, more often among women than among men. In Haute-Garonne a similar state of affairs is reported; indeed, it has been called the classic department of cranial deformation. The forms of head which we at once associate with Toulouse can be divided into three main types according to the point where compression is most noticeable. Thus there are, according to the classification of Ambialet, the coronal, pre-coronal and post-coronal types. These descriptive terms, which are not, in my opinion, very satisfactory, can be supplanted by others used by Ambialet himself and meant to describe the degree of inclination given to the skull. Thus he speaks of the Horizontal and Oblique Types, which can themselves be divided into mild, moderate and extreme. Generally speaking, the Toulouse deformation is of one type: that resulting from the pressure of a circular bandage, bandeau (bendel or pouwtou) or a serre-tête (sarrocap or transparent). The forehead is retreating and the whole head elongated in a backward direction. This posterior lengthening is the dominant characteristic of the Toulouse deformation. According to the difference in the tightness and position of the constricting bandages or rather bands, the forms given to the skull are exceedingly diverse. Thus in one type (the Horizontal of Ambialet) the crown of the head slopes backward, and then the occiput falls in a rounded curve. In another somewhat similar form the occiput is

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81 Coutèle, pp. 89-92.
82 Delisle 6, p. 135. It should be observed that in certain cases the institutions visited by Delisle contained more women than men patients, a fact which may account for some of his estimates.
83 Ambialet, 1, pp. 10, 21.
84 But see Broca, 10. In the course of his remarks he notes the fact that skulls showing Toulouse deformation were found in a cemetery in Paris at Saint-Jacques-de-Boucheir. The normal Toulouse skull is either brachycephalic or mesaticephalic. For the most common type of deformation see Lagneau, 4, p. 672.
itself flattened, and in another (the Oblique of Ambialet), the crown of the head is flattened and at bregma are tranverse depressions giving a bilobed appearance to the skull. The head-dresses which produce these curious results are, as has been said above, of two distinct kinds. We first have the common serre-tête, which consists essentially of a form of head-dress or cap of which the depth is rather excessive. At the lower part of the front border is a short notch, and from this on either side proceed two ribbons long enough to encircle the head twice. The bandeau consists of two main parts, namely, the central and the lateral portions. The latter is formed of narrow ribbons of varying lengths but long enough to go occasionally thrice or even more round the head. To the anterior edge of this bandeau is often added a lace border of varying width for the purpose of decoration.\textsuperscript{35}

The conclusions to which Ambialet\textsuperscript{36} was led in his consideration of the Toulouse form of deformation were eight in number.

1. The deformation is produced artificially.
2. The skull takes different forms according to the nature of the constriction.
3. The compression usually causes a thickening of the skull at the points of application, and sometimes meningeal adhesions occur.
4. Flattening of the ears and localized patches of baldness are to be seen in the majority of subjects.
5. At the points undergoing compression the convolutions of the brain retain their infantile characteristics. The fissure of Rolando is not completely forced back, but its obliquity is always increased. The gyrus frontalis inferior is submitted to the same pressure as the inferior extremity of the fissure of Rolando.\textsuperscript{37}
6. The actual weight of the brain is only reduced in cases of extreme deformation. Relative weight is, however, altered, even in moderate degrees of compression.
7. There is no effect upon the mental faculties.
8. It has not been established that artificial deformation of the skull is fully transmitted by heredity in all its characteristic types, but traces can be detected in one or two generations.

Similar forms of deformation are found in Ariège, although the custom is not so common, and is comparatively rare in the mountainous districts. At Saint-Lizier, where magnificent

\textsuperscript{35} Cf. Gelin: Ambialet, 1; Ambialet, 2.

\textsuperscript{36} Ambialet, 1, p. 103.

\textsuperscript{37} Cf. the account of Achille Cantié's brain in \textit{Bull. de la Soc. d'Anthrop. de Paris}, 1880, 3e Série, III, 165-167, and cf. Broca, 9, p. 419.
Gallo-Roman remains are extant, Delisle found in the insane asylum that roughly 20 per cent. of the men and the same percentage of the women were deformed. In Aude, however, the practice was as frequent as in Haute-Garonne and Tarn. At Limoux, where the asylum accommodates patients from both Aude and Pyrénées-Orientales, 33 per cent. of the men from Aude alone were deformed and 20 per cent. of the women. Similarly, in Hérault, cranial deformation was remarked in 1873 by Costeplane de Camarès, and the institutions in this department accommodate cases from Aveyron, Lot, Gard and elsewhere.

It is clear from the brief summary given above and from a study of the distribution map that deformation has been practised in France over a very considerable expanse of territory. Seine-Inférieure, Deux-Sèvres and Haute-Garonne may perhaps be regarded as foci from which the custom appears to radiate to the four points of the compass. We have now to consider whether the deformation is due to intentional device or to some accidental factor. Before doing so, however, it may be of interest to glance at another kind of deformity which is clearly unintentionally produced and of which the cause seems fully understood. I refer to that unilateral flattening due to a certain decubitus of the child in its cradle. We will confine our attention to France, where the influence of swaddling clothes has had a good deal of effect in the matter of cranial deformations. In 1869, and again in 1870, Guéniot drew attention to a form of asymmetry found in the heads of infants which he ascribed to faulty position of the new-born child in the cradle. He says that the child, “tied and bound round with swaddling clothes like a sausage,” with its arms often extended along either side of its body, is laid on a flat, rectangular and somewhat shallow cradle furnished with a mattress filled with bundles of oats. Under the child’s head a flat and somewhat hard pillow is placed. The coverings over the child are fastened with attachments passing from one side of the cradle to the other, and drawn tightly through lugs so as to render the child as far as possible immovable in the position which has been given to it by the mother, that is to say, flat on its back. Sometimes the head of the child is fitted with a cap before the cradle coverings are fastened down, and

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38 Delisle, 6, p. 138.
39 Delisle, 6, pp. 139 ff.
the next step is to secure the head on the pillow. For this purpose a triangular piece of linen is employed. First of all the pillow is pressed down at one point so as to form a slight hollow in which the head can be placed. Now, on the edge of the cradle at the upper end are three lugs which are used for fixing the head. One is at the top end of the cradle and the other two at either side. After the head has been placed in the desired position on the pillow, the two long ends of the piece of triangular linen are fastened to the two lugs to the right and left of the cradle in such a way that the piece of material is drawn as tight as possible so that the child can neither turn its head to the right nor to the left. This having been done, the third end of the triangular piece is fastened to the remaining lug at the top end of the cradle. Writing also in 1869, Loblgéois, whilst agreeing with Guéniot in all essential particulars, insists upon the importance of varying the child’s position in the cradle. Mocquet continued the discussion some years later by presenting to the Anatomical Society of Paris a case of a child of 5 months showing cranial deformation caused by the decubitus described by Guéniot, and exhibiting a marked flattening on the right side of the occipital and parietal region. Similarly, Moussous pointed out the extreme frequency of this type of deformation and suggested that rachitis might be a predisposing agent. In seventeen cases children carried habitually on the left arm had a deformation affecting the right side of the head, and in four cases of carrying on the right arm the same result was seen on the left side of the head. In all these 21 cases rachitis was present. The whole question was reviewed in 1892 by Le Floch who, however, added nothing new to our existing material, and came to the conclusion that Guéniot and his followers were substantially correct in their ideas as to the origin and cause of the unilateral deformation named by Guéniot in the first place “l’obliquité par propulsion unilatérale.”

The question of the position of the child’s head in the cradle brings before us the subject of the general treatment of new-born infants. This problem is more important than is at first apparent. Obstetrical superstitions are many, and those

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40 Guéniot, 1 and 2. Cf. Delisle, 6, p. 144.
41 Loblgéois.
42 Mocquet.
43 Moussous.
44 Le Floch.
clustering around the new-born child are not the least curious. In order to illustrate our particular subject I propose to select a representative series of popular obstetric writers and ascertain precisely what contribution they have to offer on the question of the moulding of infants' heads and of the application thereto of caps and bandages. We may as well employ a chronological classification, since each writer's indebtedness to his predecessors is thereby made more apparent. We will begin with the Franciscan, Bartholomaeus Anglicus, whose *De Proprietatibus Rerum* had a great reputation in the fifteenth century, the first edition being published about 1470. Here, in treating of children he mentions the limbs of the new-born infant, saying that "for tendernes the lines of the chyld may easely and sone bowe and bende and take dyuers shapes. And threfore chyldrens membres and lymmes ben bounde with lystes and other couenable bandes, that they ben not croked nother eyyll shapen." He thus supports the use of swaddling bands which had an enormous vogue in the past. Metlinger, whose *Regiment der jungen Kinder* was very popular in the fifteenth century, has something to say about the treatment of infants' heads. He writes: "Before everything one must take care that the child's head does not rest too low and on too hard a surface. For as women will not forego their bad old habits, one must not permit it, for thereby much harm can arise such as suppurring ears and sore, misshapen heads." Metlinger is obviously aware of the deformation caused to the occiput by the cradle-board, but he says nothing about actual artificial methods. Rösslin, however, in his famous *Rosegarten* speaks of rubbing, stroking and moulding the limbs of new-born children—so sol ma im sein glyder senftiglichen angrüffen und tasten—and some seventy years later Ryff continues the same theme. "With the right hand," he says, "[the midwife] must mould the head into a correct shape." As time went on the custom seemed to spread

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43 Bartholomaeus Anglicus, Lib. VI, c. V. Wynkyn de Worde first printed John Trevisa's translation. We quote from the 1535 edition.
44 Metlinger, 1 and 2. The British Museum copy of the 1473 Augsburg edition does not contain this passage. Unger was probably using the 1476 (J. Bamber) Augsburg edition.
45 Metlinger, 2, p. 10.
46 Rösslin, c. X.
47 Ryff, p. 115: "das haupt zu rechten form trucken."
instead of disappearing. A curious commentary is to be found in the Jesuit Josset's *Rhetoric* when he writes of the necessity of moulding infants' heads:—

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Ergo caput manibus solers compone, futurum
Tot rurum tot opumque domum, ne sphaerica prorsus
Ili adit forma, in justum neve extat orbum.
Illa quidem multo stat congrua forma cerebro
Sed non ampla sine memore est ; sit longior ergo,
Inaeque cucurbitulae sese produeat acumen
Posticà de parte, equidem tunc magna patescit
Aula, locusque capax, ubi vis memori amplaquiescit.```

These lines can thus be rendered into English. "So faithful nurse, mould this head which in the future will hold so many things and so much of value. Let it not be completely round and grow into a perfect globe. This form indeed is very suitable for the brain, but does not afford enough room for memory; let it therefore be longer, so that behind it may be elongated like the end of a gourd, and then indeed a spacious court is opened where memory can rest."

Josset's phrenological theories are obvious from what he wrote, and his belief in the idea that memory was located at the back of the head is interesting if it reflected educated opinion at the time. How far the same notion was held by the lower classes would provide material for research, and I leave the question to anyone who may feel disposed to deal with it. We must pass to Jacques Guillemeau, who was a pupil of Paré, and in the course of his life was surgeon-in-ordinary to three monarchs. In his book on obstetrics, published in 1620-1621, he states that after birth the head of the newborn child should be examined. If ill-formed it should be moulded by the hands and bound up with bandages, but it must not be bound up tightly, "comme font quelques Nourrices," but simply so as "maintenir la teste avec mediocrite." This statement of Guillemeau's seems to have been widely accepted. Mauriceau, who died about 1709, and whose treatise on obstetrics was translated into several languages, deals in Chapter XXI of his work with the custom of moulding the infant's head when the sutures appear to be too widely open, but, he says, "it will be sufficient to bind them softly with a

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50 Josset, p. 8.
small cross-cloth." 

Until these sutures are entirely closed, it is convenient, he continues, "to lay upon that place ... a linnen Compress three or four double, to defend the Head, as well from cold, as other external injuries. Some Women keep a piece of Scarlet cloath a long time to it, thinking that it doth strengthen the part more. . . ." In England there was not the same insistence on bandaging the head. Jane Sharp, who, according to her own statement, had been a midwife for over thirty years, does not mention it as far as I can trace in her "Midwives' Book" (1671) but MoMath seems to follow Mauriceau when he says that heads in which the sutures are too far open are to be "softly tyed about with a little Cross-Cloath and a warm woolen compress." Sainte-Marthe the elder, in Paedotrophie mentions the moulding of the limbs of children in some amusing lines, although he does not specifically state that the heads were so moulded. Nicholas Rowe's translation reads as follows:—

"Stroke 'em but softly, make 'em streight and slock;
They'll keep, when strong, the Form they take when weak.
You may now bring it to a Form divine,
And make, in him, the Maker's Image shine."

As the years went by the practice of swaddling appears to have increased. In the anonymous Art of Nursing (1733), which has been attributed to Sir John Colbatch, it is said that care is to be exercised not to bind the babe too "strait, for fear of hindering his Growth," and a few years later Andry de Boisregard detailed the ideal form of head, an account of which may be compared with Josset's poem. The head, he says, in order to be well made, must be a little round and horizontally rather long. In front and behind it must project to a moderate extent and be slightly flattened at the sides. Both in Flanders and Paris, he adds, béguins have been worn which have caused the head to be deformed, for, he concludes, "to have a well shaped head is not to have constrained it." Levret also, in 1766, tried to check the custom of tightly

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54 Sharp.
55 MoMath, p. 338.
57 Art of Nursing, p. 4.
58 Andry de Boisregard, Bk. II, p. 4.
bandaging children’s heads. Midwives, he says, have the pernicious habit of trying to mould the new-born skull when it has suffered compression during the processes of birth. This proceeding is, he concludes, “done des plus condamnables.” Similarly Cadogan, whose work on infants enjoyed much popularity and was often reprinted, condemns bandages for binding the head. He favoured “laying aside all those swathes, bandages, stays and contrivances that are most ridiculously used to close and keep the head in its place and support the body.” Leroy is no less severe. Commenting upon the flattened skulls of Muscovites, Germans, Genoese and French, he says that the deformation of the latter is due to the midwives who have “le barbare usage de la [tête] pétir.” The unpopularity of swaddling clothes amongst the medical profession as opposed to the uneducated classes was slowly growing. In 1778 Lascazes de Compaire published a pamphlet against swaddling clothes. “Nature,” he writes, “has given liberty to the child; art gives chains”; and speaking of the treatment of the child he says that “on le lie, on le sangle, on le garrotte. . . . Barbares!” Again Raulin in discussing pre-natal moulding says it would be dangerous to seek a remedy for this condition “par les moyens funestes,” which certain badly educated people employ, namely, by moulding the head of the child, for such a proceeding meets with more danger than success.

Désessarts is much more explicit. Writing in or about 1799 he says:—

“Quelques nourrices, ayant que de coëfler l’enfant, ont la précaution sage de couvrir la fontanelle avec un linge plié en quatre, qui est assujetti par le béguin. A ce béguin pend une courroie, ou bride, que l’on fait passer par-dessous le menton de l’enfant et qu’on attache de l’autre côté, pour tenir le béguin dans une situation ferme. On met par-dessus un bonnet de laine, que couvre un autre coëflure, destinée plus à l’ornement qu’à l’utilité. Le tout, dans les premiers jours, est recouvert d’une tétière qui s’attache au maillot de chaque côté au haut des épaulas, et qui retient la tête dès enfants dans une situation droite et toujours la même.”

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59 Levret, p. 237. For Levret see Accoucheur (un), &c.
60 Cadogan, pp. 12, 13.
63 Lascazes de Compaire, p. 4.
64 Raulin, Tom. III, p. 103.
He thus goes on to say: "Quel appareil! que de liens et d'entraves!" and continues by stating that many deformities are, in his opinion, due to the use of these tight swaddlings.

With regard to the head-dress he says:——

"Quant à la manière dont on accommode la tête, il n'y a rien à réformer, si ce n'est cette bride que l'on fait passer par-dessous le menton pour assujettir le bêguin. Elle écorche très-souvent la peau au-dessous le menton; elle comprime les glandes maxillaires, et même le parotides, et y occasionne un engorgement et un gonflement."

The kind of infant's cap that Désessarts advises is——

"Un bêguin sans bride, et d'un bonnet de coton, de la forme de ceux que portent les adultes. On l'assujettit avec un ruban un peu large, qui enveloppe toute la tête, et se noue par devant. Cet appareil est simple, sans inconvénient et suffit." 65

Ballexsard was equally severe. "There are countries," he says, "where the practice of moulding the heads of newborn children is carried out, and it is a practice to be condemned. It is for the purpose of giving to the head an arbitrary shape which happens to be fashionable. . . . It is an abominable method." 65

Similarly Jean François Icart who directed a school of midwifery at Castres, mentions the fact that certain midwives in order to give the infant's head a shape that pleases them, press the sutures together. "Cette pratique est reprehensible," he writes, and adds that the child may die from it. 67

Frank, however (1799), advises a gentle pressure when the head seems out of shape, 65 but Smellie a few years earlier thinks that when the head is misshapen it should not be bound or pressed but kept lax and easy, lest the brain being compressed convulsions should ensue. 65 Medical opinion, however, did not succeed in banishing the evil from rural districts. Perrin notes the customs of the midwives in Brittany, who as soon as the infants are born, mould and press their heads, endeavouring to make them rounder, a proceeding which used

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65 For Désessarts' remarks, see Désessarts, pp. 75, 76; 91-92; and cf. Le Bourrier, p. 81.
66 Ballexsard, pp. 16-17. Over a hundred years later Droixhe was saying the same thing in Huy. See Droixhe, p. 38.
to cause the babies to howl with pain. And elsewhere he says that scarcely has the child taken its first breath than it is handed over to the "brutal manipulations of the midwife." It is then made the victim of fresh tortures. The strips of swaddling cloth are first laid across the knees of the woman and then they are rolled round and round the child beginning with the arms. The head remains fixed and immovable, and when the operation is complete the infant resembles nothing so much as a miniature mummy. Somewhat similar remarks are made by the Combes in their study of the French peasant. "The distressing custom of covering the head of the new-born child with bandages causes cranial deformation," they aver, and they note that at times more than one variety of deformation can be observed in the same family. We may well conclude with Jean Jacques Rousseau's lament in *Emile*, when he says: "Several midwives assert when they are moulding the heads of new-born children that they are giving to them a more comely appearance; and it is tolerated! The Author of our being has made our heads badly; midwives must improve them externally and philosophers within." 

We now follow up the custom of cranial deformation as it occurs in Italy. Certain authors of the sixteenth century asserted that the skulls of children were compressed in northern Italy, a custom thought to have been borrowed from the Moors. Thus Scaliger (the Elder) says: "Sic Genuenses, cum à Mauris progenitoribus acceptissent olim morem, ut infantibus recens natis tempora comprimerentur: nunc abaqueullo compressu Thersitico et capite et animo nascentur," and it is probable that the custom was either continued or died out, leaving possibly head moulding as a relic of the old practice. To-day in the rural districts the limbs of new-born infants are massaged, and it would seem probable that the custom is widely spread in many of the less civilized districts. Again, in Spain the Catalans are said occasionally to produce a circular depression on their skulls by means of handkerchiefs bound tightly round the head, although I am

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70 Perrin, 1, vol. i, p. 27. The frontispiece shows the performance.
71 Perrin, 2, vol. i, p. 49.
72 Combes, p. 159.
73 Rousseau, vol. iii; Emile, liv. i, p. 16.
74 Scaliger, cap. ix, p. 287.
75 Delisle, 6, p. 139.
not aware whether these bandages are applied at a very early age. Similarly, the form of deformation common in the Toulouse districts has been noticed by Costeplane de Camarès both in Cartagena and the Balearic Islands, and Siret reports it also in Spain.

In 1876 Virchow affirmed that nowhere in Central Europe was the custom of pressing the head more widely diffused than among the women of Lusatia, belonging to the stock of the Serbian Wends. The small girls were accustomed to wear on their heads a broad sash, beneath which was a tightly constricting bandage. The custom was so popular that it is said that the women preferred to sacrifice a part of their hair, which suffered under the compression, rather than give up the cherished bandage. In the seventeenth century the practice of moulding children's heads was not unknown in Germany.

Völkmern, in his book of instruction for midwives, published in 1687, insists upon the necessity of anointing and binding up the heads of infants if they are considered ugly, and he also mentions the application of a little tightly-fitting cap which apparently was to be worn during the night. In another manual published in Nuremberg in 1688, the author discusses the swaddling and binding up of the head of the infant, even going so far as to give instructions how to manipulate the child's nose if it is considered to be of an objectionable shape.

Muralt also, in a popular nursery guide published in Basel in 1697, says that when the midwife has the child upon her lap immediately after birth, she is to examine the whole body of the infant in order to see if it is normally formed; and then she must attempt to give the head a round form by moulding it, finally placing upon it a piece of scarlet material and a little cap.

On the other hand, Mellin, who published in 1781 at Kempten in Bavaria a book on child nurture, sounded a warning note. He thinks little warm caps are desirable, as long as they are not too tight and do not press unduly upon

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75 Costeplane de Camarès. 77 Cartailhac, p. 303.
76 Virchow, 6, p. 137. 79 Völkmern, p. 416.
the ears, for projecting ears conduce to better hearing in later life. Mellin was fully aware, it seems, of the practice of head binding which was prevalent in his day. He discusses the manipulation of the skull in order to produce a more comely shape, and remarks that no force should be used during such operations.\(^3\) Hoffmann, however, in a small treatise on how women can become happy mothers of healthy children, sounds a warning note against the compress, saying that it is quite unnecessary and that the cap is to be used merely for warmth and protection.\(^3\) The movement against the compress seems to have been successful, since Osiander, who was Professor of Obstetrics at Göttingen, and who died in 1822, omits any mention of it in his handbook of the art of midwifery, merely saying that the head is to be covered with a soft woollen cap.\(^4\)

It does not seem that swaddling disappeared with the deforming cap. In a small handbook on how children are to be raised to be physically sound a Leipzig doctor dealt with the problem as it presented itself in his time. Published in 1815, this manual is typical of the period and is full of sound instruction for the young mother. "The clothing of the child during the first years of its life," the author writes, "demands the attention of the physician, since it undoubtedly has a very considerable influence upon the physical well-being of infants. The usual custom is to wrap up the child in swaddling clothes during the first weeks of its life, but all the most recent teachers are now against this practice, which they regard as a sin against nature and which they think is the source of many harmful and evil results. Avoidance of extremes, here as always, is the best plan. The idea of not wrapping up the child at all, but of merely laying a light coverlet over it, as the later authorities have for the most part prescribed, is more easily said than done. A new-born infant is difficult to manage. During the first three months it is too tender and yielding to be easily and safely handled. It must have some suitable support which is obtained by employing a wrapping of some sort, and this can scarcely be applied without swaddling." The writer then goes on to say that if tight wrapping is avoided little harm can ensue, and that it is advisable that

\(^3\) Mellin, pp. 7, 49; cf. Goldhammer, p. 198.
\(^3\) Hoffmann, pt. 2, p. 326.
\(^4\) Osiander, p. 476.
once daily at least the infant should be unwrapped and allowed to exercise its hands and feet.\textsuperscript{85}

This passage is interesting, inasmuch as it reflects medical opinion of the period upon the subject of swaddling, and suggests that the tight head-dress was already almost, if not quite, obsolete. Another handbook, published some sixteen years later, does not appear to insist at all upon the dangers of swaddling and head binding, and thus we may say roughly that the latter practice died out in Germany towards the end of the eighteenth century.\textsuperscript{86}

In Hungary also, although care is apparently taken to prevent the new-born infant from lying on its back for long periods, the practice of pressing the head is found when the skull seems to be too long in order to make it rounder. Moreover, the nose is pulled when it is too flat, and the ears also are manipulated.\textsuperscript{87}

In Holland there has been considerable doubt as to whether artificial cranial deformation has been produced. Certain peculiarities in Frisian and especially Zuyder Zee skulls have been noticed for some years. Van Hoeven indicated a few of them in his Catalogue of skulls of different nations (1860),\textsuperscript{88} and Lubach had similar remarks in his Natural History of the Netherlands published a year later.\textsuperscript{89} Spengel, in 1876, dealt in greater detail with a specimen from the Island of Marken,\textsuperscript{90} and Virchow, probably after reading Spengel's paper, came to the conclusion that the Marken skulls were artificially deformed.\textsuperscript{91} Bolk many years later concurred with this opinion,\textsuperscript{92} but it was left to Barge to describe more fully in 1914 the means by which the supposed deformation may have been effected. In Marken he distinguishes two main kinds of head-gear, that worn by the children and that worn by the women. The children's hats are the same for both sexes but the boys wear them only until

\begin{flushright}
\textsuperscript{84} \textit{Wie können Kinder,} \&c., pp. 37-38. As early as 1618 Herliebus had pointed out the body of an infant is as yielding as wax (p. 414), a remark to be repeated later by Bracken (p. 272). Richter, in 1738, approved of swaddling infants for four months, leaving neither feet nor hands free (p. 103).
\textsuperscript{85} \textit{Kurze u. deutliche Anweisung,} \&c.
\textsuperscript{86} Hoeven 1, p. 14.
\textsuperscript{87} Temesváry, p. 139.
\textsuperscript{88} Lubach, p. 422.
\textsuperscript{89} Spengel.
\textsuperscript{90} Virchow 6, p. 191; cf. p. 138.
\textsuperscript{91} Bolk, p. 140.
\end{flushright}
the sixth or seventh year, whereas the girls wear them until the sixteenth or seventeenth year, when they are changed for those worn by women, and these are worn for the purposes of decoration during the entire life. The child’s cap is an indispensable part of the infant’s wardrobe, and is put on immediately after birth. It is of somewhat elaborate construction and is composed of the following parts:—

(1) A three-cornered piece of linen of which the longest side is strengthened by a lace trimming. To each end of this side ribbons are attached.

(2) A small three-cornered piece of red woollen cloth.

(3) A three-cornered piece of muslin similar to, but smaller than (1). A rectangular piece of lace is sewn to the longest side.

(4) A cap (Haube) of linen with a narrow edging of lace fitted with an arrangement for tightening it, and having affixed to the left side a broad throat band which is fastened to the right side by a pin.

(5) A cap of varicoloured calico with a heavy lining and composed of six parts. Here a throat band is fitted about 2 in. broad and fastened on both sides with pins.

The method of wearing these caps is as follows. Firstly (1) is placed on the head so that the longest border crosses the middle of the frontal bone, or somewhat lower, and passes obliquely underneath the external occipital protuberance. Here the ribbons cross and are brought back and tied in the neighbourhood of bregma. On the top of this (2) is placed: its function seems to be purely decorative. On this (3) is laid and is fastened in precisely the same manner as is (1), the result being that the red cloth shows through the rectangular border of lace. Above and behind this (4) is put and the throat ribbon is adjusted. On the top of all these is placed the calico cap (5), and the broad throat band is fastened to it after passing under the chin. The women’s caps (see Pl. III, a, b) consist of the following parts arranged on the head in the order described, and fastened for the most part with pins.

(1) An unstiffened linen cap laid loosely on the head.

(2) A strip of strong pasteboard curved over the back of the head and fastened with a ribbon which encircles it.
PLATE III.

A Marken Head-dress.

Parts of a Marken Head-dress.
(3) A cap similar to (1), but this is made to fit the head neatly by means of pinned pleats.
(4) Two pieces of red tagged lace (Nestelband).
(5) A linen band often decorated with black designs.
(6) A narrow black galloon wound twice round the head.
(7) Sometimes another piece of red lace as (4). To (4, 5, 6 and 7) are attached a series of ribbons.
(8) A cylindrical muslin bonnet provided in front with a lace border. A piece of brass wire wound round with yarn is inserted into the back of the bonnet to preserve its shape.²³

The question whether these caps can produce the peculiar elongated appearance of the Marken skulls is answered in the affirmative by Barge, and he says that it is the children’s caps that are responsible for the deformation (see Pl. IV). Pressure is exerted upon the frontal bone by the longest edge of the triangular head-dress and upon the regions behind bregma and beneath inion, that is to say along the path of the ribbons. The result of this is that the frontal region is depressed and is inclined backwards, and this naturally affects the parietals also.²⁴ There appears to be some difference of

²³ Barge, 1, pp. 512 ff.: cf. Barge, 2, pp. 68 ff. For those who are interested in the fashions of Marken the following works may be consulted. A. Esquiro, The Dutch at Home (London, 1863), p. 168, says that the women’s caps in Marken resemble in shape the mitre of the old bishops. Peasants wear “the irons” (Oorijzer) and they differ according to the provinces of Holland. E. Friedel, Über niederländische Alterthümer (ZE, 1873, V, 33-42), describes the head-dresses of girls and women as being shaped like helmets made out of sheet silver which are gilded beneath. These are secured over the ears by projecting spiral springs or flat double spirals. “The irons” are often in the form of broad crescentic plates, ending on the temples in two large circular rosettes or smooth oval gilt discs. Sometimes they are decorated with precious stones and pass from generation to generation as heirlooms. Cf. also J. Winkler, Oud Nederland (d. Haag, 1886), pp. 276 ff.; G. W. Edwards, Marken and its People (London [1913]), pp. 9 ff.; T. Molkenboer, De Nederlandsche nationale kleederdrachten (Amsterdam, 1917), p. 128 and especially pls. 3-6; D. J. van d. Ven, Nederlandsche Volksleven (Zalt-Bommel, 1920), Abh. 183, where a fisher lass is depicted with a tight cap and ear-pieces as worn in Urk in the Zuyder Zee; and G. Buschman, Illustrierte Völkerkunde, 3 vols. (Stuttgart, 1922-26), III, p. 220, where a girl’s hat is shown with the metal flaps or ear-pieces.

²⁴ Barge, 1, pp. 515 ff. Cf. Nyéssen’s criticism and his opinion that Vesalius thought that head forms were influenced by head-dresses. See Nyéssen, pp. 13, 58.
opinion as to the degree of tightness of the children's caps. Barge's informant told him that the ribbons of the children's caps were usually drawn very tightly, but he added that he and his wife had not done so as they thought it unpleasant to have children with queer-shaped heads, this being particularly noticeable in boys, since the girls would wear head-dresses throughout life, thereby concealing them. He went on to say that this queerness consisted in a retreating forehead and occasionally a ridge appeared where the ribbon had been. At the Anthropological Congress at Amsterdam in 1926 the Marken skulls were discussed, and some of the delegates investigated the caps worn by the peasants. From verbal communications I have gathered that some were not convinced that the caps as worn at the present time are capable of producing the alleged deformation. Further inquiry on the spot is necessary, and especially an examination of the caps and the tightness with which they are secured during the first three weeks of life, before the certainty that these head-dresses produce cranial deformation in Marken is attained.

We now pass eastwards to Russia. Head deformation can be divided here into two main types: (1) that produced by the application of wads, pads and bandages to the head, and (2) that produced through the influence of the cradle. In many parts of Russia also the child's head is moulded immediately after birth; the nose is pulled and pressed; and other manipulations are practised in order to bring the infant up to the local standards of beauty. With regard to the first category, such methods are practised in the Caucasus, parts of Poland, White Russia and parts of Russian Lapland. In the Caucasus the method appears to be somewhat as follows. A little cap, lined with wadding, is placed upon the head of the new-born infant closely encircling the frontal, parietal and occipital regions of the skull, being fastened by a band running round the head. According to Sokolov, this custom is prevalent throughout the Tiflis area among Armenians, Jews, Greeks and Ossetes. The result of this head-dress is to flatten the forehead, and people in which the frontal regions are curved are rarely seen. Woollen bandages are also used, and similar customs exist in the Achalzyk district. Here children

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26 Krebel, p. 9. Cf. the strapping of peasant babies when carried in Russia. See Mesakin, p. 56.
wear helmet-shaped padded caps, provided with bands which surround the head so that the skull can only develop in an upward direction, taking the shape of a melon. The Ossetes use strips of cloth for binding their children’s heads, and therefore almost all of them have flattened foreheads. The Greeks, also, living in the Zalka (Tiflis) district bind the heads of their children with cloth and woollen bands, whilst the Armenians of the Tschervus-Delages (Erivan) district cover the heads of new-born children with two pieces of cloth, the one spread over the head and the other securely wound round the temples, the ends being tied over the forehead. Amongst the Poles the midwives in some districts try to give a desired shape to the skull by manipulation. Bandages and pads are also used, a dressing of flax moistened and mixed with the white of an egg being sometimes employed. Over these is placed a piece of cloth, and upon this a second passing over the top of the head and fastening under the jaw. In West Russia the bandages and dressings are not applied to all children, but only to those whom the midwives think require it. In the Vitebsk district the heads of the children are first moulded manually; then they are bound with a cloth passing either across the frontal region and behind the occiput, or over the parietals and under the chin. This bandage remains in position for two or three days or until the child is christened. Similar bandages are used in the districts of Minsk and Mogilev. Among the pure Russian population it is said that these restraining bandages are never used, which suggests that the custom of head-binding in this district may be due to Polish influence.

Cranial deformation does not seem to have been observed in any ancient skulls from the Baltic and more northerly regions. However, Lukkarinen and Hatt have both called attention to the moulding of the heads of infants among the Scandinavian Lapps. Hatt reports that three methods are known: (1) massage, (2) bandaging, and (3) head-dresses.

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97. Radde 1, p. 87.
101. Hatt, G., 1, 2.: Hatt, E. D.
Dolichocephaly is repulsive to these people and brachycephaly is admired, but only a few among the women attempt to produce artificial deformation, and in these cases it may be a relic of an ancient practice. Düben, however, found no traces of it in his investigation of Lappish skulls. In the cases where deformation is attempted the whole body of the newborn baby is moulded by greasy hands. This is done after the first bath, and then after each successive bath. This operation of moulding the head is called *doebjot* (to press the head) in Pite Lapmark. One hand is placed upon the forehead and the other upon the occiput. The back part of the head is then stroked by the hand with an upward motion. This manipulation is usually carried out for three days, whilst the massage of the body often continues for three months. Of all these manipulations the moulding of the head is considered the most important; but the nose is also pressed and pushed upwards, especially in girls, and the ears are squeezed and the tongue pulled out "to make the child speak well." In some places a silk handkerchief was tied tightly round the head after moulding, and indeed it was sometimes considered more important than the actual rubbing, a fact to be borne in mind when we consider the intentional or unintentional meaning of the custom. The handkerchief was occasionally so tight that an old Jämtland Lapp is reported to have said that it was tight enough to squeeze all sense out of the child's head. These bands, which in some places were made of cloth, leather or reindeer hide, were worn for periods varying from one to five years. The conscious motive does not appear always to have been for the purpose of increasing brachycephaly. The early closing of the anterior fontanelle was considered good for the sound development of the child, and thus attempts were made to cause a premature closing of the sutures. Similarly, moulding the head and the use of bandages have been reported in Karelia and Ingermanland.

Among the Russian Lapps shortly before the child is bathed a tight-fitting helmet-shaped little cap is put on the head. This cap has two long bands which are bound many times round the head and are finally fastened over the forehead. The child is bathed whilst wearing this cap, and care is taken that the water does not enter it. After bathing the

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102 Düben. 103 Hatt G, 2, pp. 245-254.
little cap is removed and another form of constriction is applied. This is a bandage which is broad in the middle but with narrowing ends. The broad part is laid over the forehead; the ends are crossed behind the occiput and are then brought forward and tied over the forehead. This bandage remains in use for six months and is only changed when the child is bathed. 104

Cranial deformation has long been noticed among the Akkhasians of the north-west Caucasus. 105 Those near the coast are said by Chantre 106 not to practise it, but I have not seen this statement confirmed elsewhere. Similarly, the Lazes about Batum are reported as practising deformation. Pittard remarks in this connection that “it must not be forgotten that cranial deformation is still esteemed amongst this population. The most usual deformation consists in a fronto-occipito compression which causes the posterior parietal region and the superior occipital region to become somewhat prominent. From the point of view of the cephalic index the deformation would diminish brachycephaly, for the maximum antero-posterior diameter is increased. A medium brachycephaly is therefore the characteristic of the Lazes,” 107 and the mean C.I. is 86.06.

Pallas, in his travels at the end of the eighteenth century, found deformation among the Tartar mountaineers of Keekenice, Leemena and Simäus, where he reports that they have a strange appearance. Their faces are of an unusual length and their arched noses are exceedingly long. Their high heads are compressed with a view to making them flat, and the whole contributes in producing diversified caricatures, so that the greater part of this population has distorted countenances and the least deformed amongst them resemble satyrs. 108

We can now pass to a consideration of deformation produced by the influence of the cradle. Cradles responsible for these distortions have a wide distribution and are fairly uniform in type. A Georgian cradle resembles a small bed with low rims. Instead of legs it is supported by rocking

104 Pokrovsky 3, p. 548.
107 Pittard 2, p. 61.
boards, and in this cradle the child is laid face upwards on a mattress and is tied down to the cradle by a couple of bands. One of the bands, the so-called breast band, passes across the shoulders and chest of the child and is twisted once or twice round the cradle and is then fastened to the upper cross-beam. A second band secures the child's legs in a similar manner. Other Caucasian peoples build their cradles on a like plan, and the children are tied in these cradles usually very tightly and for a long time. Thus, for example, in Kizliar (Terek Delta) the child is taken out of the cradle only twice daily in order to change the bed clothes, and some writers on the Caucasus aver that the mother does not take the child out even when feeding it. Dr. Valessky says that the children in Guria, Kutais, are kept in their cradles at least two years; whilst Rasmourk reports in other parts of Kutais that the time is about one and a half years. The result of this continual pressure on the back of the head, due to the position in the cradle, is the flattening of the occiput, and this has been observed in a number of cases.

Some children's skulls were discovered in certain Crimean tombs by Merezhkovsky, and they exhibited distortions of various kinds. Some had a simple occipital flattening whilst others showed a partial obliquity to one side. Amongst these people cradles are used similar to those employed in Georgia, and it seems probable that the deformations observed can be traced to their use.\textsuperscript{109} Amongst the Russians themselves flattened and asymmetrical occiputs have been observed in children, and medical opinion in Russia is inclined to attribute these abnormalities to the positions the children are forced to adopt when in their cradles.\textsuperscript{110} From a consideration of the evidence, Pokrovsky thinks that:

\begin{enumerate}
\item The direct influence of the cradle, if it does not disappear with age, results in a slight asymmetry and flattening.
\item This influence is more pronounced in brachycephals owing to the natural tendency in growth.
\item When restraining bands are used to secure the child in the cradle, then the asymmetry and
\end{enumerate}

\textsuperscript{109} Pokrovsky, 2, pp. 207-213. I am again indebted to Mr. B. Uvarov for translating certain passages.
\textsuperscript{110} Pokrovsky, 2, p. 213.
flattening are usually more frequent and more pronounced.

(4) Since the use of these restraining bands coincides with the distribution of marked brachycephalic peoples (from the Caucasus, etc.), the asymmetry and flattening reach their maximum development.

(5) The deforming influence of cradles and bands more often leads to asymmetry coupled with slight flattening than to flattening alone, and therefore it is not an important factor in shortening the skull. Long skulls cannot become short through this influence, but an original brachycephaly can be emphasized.\textsuperscript{111}

(6) Certain cases of slight asymmetry may not be caused by the cradle, but can perhaps be ascribed to other causes.\textsuperscript{112}

In the discussion of Pokrovsky's paper, D. N. Zernov\textsuperscript{113} denied that cradle deformation could be produced so as to persist into adult life. Pokrovsky, replying, said that Zernov ignored the fact that children are sometimes bound in their cradles until the end of their second year, and that this fact would easily account for permanent deformation.

In Bosnia and Herzegovina 62 per cent. of the recruits at one time examined by Matosek showed flattened skulls due, it is said, to the very tight dressing of the babies' heads during the early months of life.\textsuperscript{114} In Turkey also, or rather in what was formerly Turkey in Europe, macrocephalic skulls are known to occur,\textsuperscript{115} and in Greece they have been reported both among the living and the dead.\textsuperscript{116} Vesalius\textsuperscript{117} remarked that head moulding was known it both Turkey and Greece:—

\[... magis adhuc Graecorum et Turcarum capita globi fere imaginem exprimunt, ad hanc quoque (quam illorum non pauci elegantem, et capitis quibus varie utuntur tegumentis accommodum consent) obstetricibus nonnunquam magna matrum solicitudine opem ferentibus.\]

\textsuperscript{111} This can, I think, hardly be maintained. Cf. the experiments of Walcher and Elsässer.
\textsuperscript{112} Pokrovsky, 2, pp. 218-219.
\textsuperscript{113} Pokrovsky, 2, p. 226.
\textsuperscript{114}\textit{Physical deterioration, etc.}\textsuperscript{115} Weisbach, 1.
\textsuperscript{116} Kopernicki.
G. B. della Porta\textsuperscript{118} concurs also in the view that brachycephaly can be influenced by head-dresses. Cleland\textsuperscript{119} denies artificial cranial deformation among the Greeks, a statement in which he is probably correct, but among the Armenians, Kurds and the nomad Vlach\textsuperscript{120} fronto-occipital deformations are reported. In Anatolia and Crete head deformation is still known. Hawes\textsuperscript{121} reports that thousands of non-Mussulman men in Crete are deformed, and that this deformity is produced intentionally by bandaging the heads of the children from the age of fourteen days upwards.

It would not seem that in Albania the custom of moulding the heads of infants is entirely unknown. Miss M. E. Durham\textsuperscript{122} tells me that she is acquainted with some young Albanians who have assured her that mothers occasionally attempted to mould the faces of their children, and in the course of conversation one informant demonstrated upon his own face the movements of the moulding hands, which were used so as to flatten and smooth out the temples, and to round and shorten the jaw. In the case in point the young man had a short round face, and he said that his mother had boasted that she had made it so by her manipulations.

However this may be, it does not seem improbable that such manipulations were indeed carried out in parts of Albania, and that now and then the efforts of mothers and midwives had some effect upon the shape of the face. As Miss Durham has pointed out, the round face may have been a type of Byzantine beauty, and thus traditions might linger in those parts of the Balkans which came under the influence of Greece.

Before summing up our brief account of cranial deformation in modern Europe, it may be of interest if a note is here appended upon one more phenomenon, which, although it has nothing to do with that particular variety of cranial deformation which we have been considering, is in the nature of a mutilation of the skull and has aroused a certain amount of interest in some quarters. I refer to the sincipital T. This consists of a scar upon the surface of the skull when seen in norma verticalis. In shape it is somewhat like a T, and is found in numerous crania from different parts of

\textsuperscript{118} Porta, Lib. II, p. 77. \hspace{1cm} \textsuperscript{119} Cleland.
\textsuperscript{120} Borelli. \hspace{1cm} \textsuperscript{121} Hawes, p. 288. \hspace{1cm} \textsuperscript{122} Durham.
the world. It is reported from alleged neolithic sites such as Epône (Seine-et-Oise); from Central Asia, Canary Islands, Africa and America. It is said that Avicenna noted a practice which consisted in cauterizing the top of the skull in the form of a cross as a remedy for certain diseases, and Grön quotes Adam of Bremen in this connection, although his conclusions have been challenged by Reinacl. It would appear that these scars left upon the skull were sometimes produced by means of a cautery, and that the custom was perhaps due to an idea that insanity and epilepsy were relieved by the application of fire to the head, a notion based upon some obscure chain of reasoning which at present we cannot elucidate completely. However that may be, the sincipital T has no connection with the primary interest of this essay, and it is to this subject that we must now turn our attention.

We have seen in the above survey of cranial deformation in Europe that two main varieties can be broadly distinguished: the distortion produced by the application of bandages and tight-fitting caps to the head, and the distortion produced by the influence of the cradle on the occiput and the parietals. Now can we say of either of these two varieties that they are intentionally produced? Can we state positively that when a mother binds up the head of her child with, for example, "a little Cross-Cloath," she does so for the express purpose of altering its shape? I think that, to a certain extent at least, we can say so. It would seem from a careful consideration of the popular obstetric manuals that I have quoted that midwives have been in the custom of binding up the heads of children with the conscious intention of changing their shapes. How and why such an idea first entered the head of a midwife or of a mother we will consider in another place. Here it will be convenient to concentrate our attention upon the two questions of intention and accident. Unfortunately, we do not know the precise dates at which it is certain that cranial

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128 Manouvrier, 2.
124 Sudhoff. Cf. Zaborowski, E.
126 McCurdy, 1; Moodie.
128 Grön. Reinacl.
129 Cf. the frontal furrows of the natives of New Britain (see Parkinson, p. 107; Pullen-Bury, p. 199), and also the scars found in the bregmatic region in skulls from the Canary Islands (see Chil y Naranjo, p. 178; Laschau, 3; Lehmann-Nitsche, 2 and 3).
deformation was being actively carried on in Europe. It would seem possible that, according to Bartholomew Anglicus, such a custom may have been prevalent in the fourteenth century, and it seems to me possible also that these practices may have been carried over from the Middle Ages into modern times. Whether the practice of covering up the head of the child with a cap or bandage is connected with the custom of swaddling is also a doubtful question. The whole problem of swaddling is not easy to discuss. Whatever may have been its origin, there is little doubt that it is of some considerable antiquity. The *fascia* (στρυφάνον) of the ancients was a band of material used to wrap round the limbs of infants, and Plato hints at the possibility that this wrapping was continued for some two years.\(^\text{129}\) The Lacedæmonians do not seem to have complied with the custom, leaving the limbs of their children entirely free,\(^\text{130}\) and from the various reproductions of swaddling clothes which have come down to us from antiquity it does not seem that the head was always bound up as well as the body. In a monument dating from Gallo-Roman times at Beaune, a child is shown in its cradle, and it is bound down by bands passing through lugs at the sides of the cradle, whilst the head of the infant is apparently bound up with a bandage and pressed forcibly down upon a raised pillow. The form of cradle reminds one of the examples found in the Caucasus and also in parts of modern France, and it seems possible that some connection might be traced. With regard to the swaddling clothes used by the Greeks, it does not seem that these were usually very tight; rather they served for protection against the injuries of childhood.

In England the word *swathelband* is the earliest form of the word. In *Vices and Virtues* we read: "He lay bewunden on fitere and mid swathelborne ibunden" (He [i.e., Christ] lay wrapt in rags and bound with swaddling bands,\(^\text{131}\) and it was only in the early nineteenth century that the practice was being gradually abandoned.\(^\text{132}\) In France the custom was very common at least as early as the twelfth century, when the form *Maillol* (Maïlot) occurs in the *Roman de Thèbes* (c. 1150):——

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\(^{130}\) Cf. Becker, p. 217.  
\(^{131}\) *Vices and Virtues*. The dialogue dates from about A.D. 1200.  
\(^{132}\) Buchan, p. 10.
En la cambre vont el tot droit
Ou li enfés petit estoit;
Porté l’en ont en son mailloel,
Et la roine fait grand doel. 135

The original French form seems to have been derived from *maille*, and the word occurs in such forms as *Maillol*, -out, -el, maillot and mailluel. A charming picture of the nativity, where the babe is seen bound around with a long criss-cross swaddling band, is painted in the Berry Bible (c. 1400) [Harley MS., 4382, f. 159, in the British Museum]. Again, Walter de Biblesworth (late thirteenth century) writes:—

Kaunt le emés sera nées,
Lors deyt estre maylolez.

where the gloss on “maylolez” reads “yswathid.” 134

Lacroix 135 illustrates some examples of swaddled children with which may be compared Genevrier’s account of similar drawings of the Italian school, where again the head is usually shown unbound. 136 Thus it would appear that the practice of swaddling did not have any direct influence on the custom of binding up the head. 137 Indeed, it seems that in some places there was a break in the continuity of the practice of deformation. In Toulouse it is said that illuminated manuscripts of the fourteenth, fifteenth and sixteenth centuries show normal round heads, whilst drawings of the seventeenth and eighteenth centuries exhibit the characteristic Toulouse deformation. 138 I am inclined to doubt the validity of this

135 Lacroix, Pl. IV, p. 80 and fig. 61. Of. Wright, 1, p. 60.
137 It would seem, however, that when the child was swaddled the usual custom was to bind the head round with a bandage. Illuminated manuscripts of the fourteenth and fifteenth centuries show this point very clearly. Thus, to select merely from the collections at the British Museum, I find that in a French Book of Hours of the XVth Century (Add. 25695 f. 165) the child’s head is shown bound around with a white bandage; in an English MS. of the XIVth Century (6 E, VI f. 296b) the infant is depicted swaddled in some blue speckled material of which a portion is used as a head band; in a XVth Century translation of Valerius Maximus (Harl. 4374 f. 39b) the head of the child is again bound round with a white bandage, a similar scene being found in a Flemish XIVth Century MS. (Sloane 3983 f. 17). Unfortunately, our present knowledge does not enable us to say how tightly these bandages were bound around the head, and manuscripts which show children being bathed show them, as far as I have observed, with the head band removed.
argument, but at any rate a clearer continuity is perhaps discernible in the Caucasus. Here deformation can be traced more or less continuously from the early Middle Ages until the present day. Further light on prehistoric Russia may add a great deal to our knowledge of times prior to that date. Similarly, research in peasant customs all over Europe may reveal traces of the practice of deformation which have up to now escaped the observation of students.

Although in the distribution map the modern area may seem suggestive, I shall not venture upon hypotheses which seem to me insufficiently buttressed by facts. We know for certain that in the Middle Ages cranial deformation by means of bandages was practised in certain parts of Europe and that the same custom was known in modern times. A comparison of the sites may suggest to some that a connection is to be sought, and that the custom of deforming the head in the Middle Ages was the parent of the same custom in later times. This supposition does not appear to me to be altogether without justification.

With regard to the deformation produced through the influence of the cradle, the case is somewhat different. The fact that a deformation of the occiput is effected seems to me to be purely an accidental feature in Europe. Children tightly swaddled are laid in cradles for long periods of time. Whatever may have been the reason for this long period of swaddling, it does not seem reasonable to suppose that it was for the sole purpose of flattening the occiput. The flattening should, I think, rather be regarded as an accident which accompanied the prolonged period of decubitus in swaddling clothes. Similarly, the oblique flattenings and asymmetries seen in certain of the European skulls are not deformations produced intentionally by parents or midwives, but unintentional accidents produced by the custom of forcing children to lie in certain positions under restraining influences.

Thus, to sum up, there are two main varieties of cranial deformation observed in Europe. Firstly, we have the type produced by bandages or tight caps, and secondly, the type produced by the position of the child in the cradle. Of these the first is intentional and deliberate, the second unintentional and accidental.

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190 See Cabanès, 1, pp. 115, ff.
Skulls from Marken.
MAP SHOWING APPROXIMATELY, DISTRIBUTION OF CRANIAL DEFORMATION IN ASIA.

Map IV.