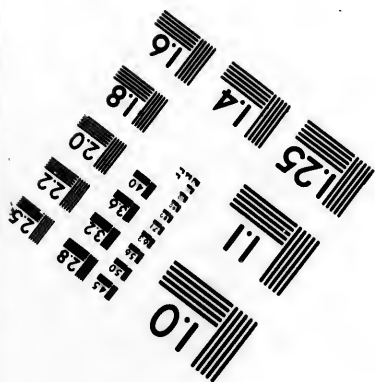
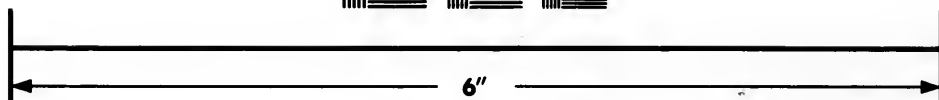
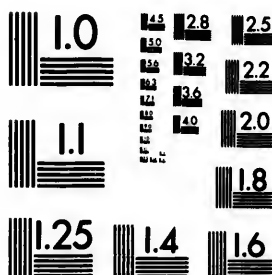


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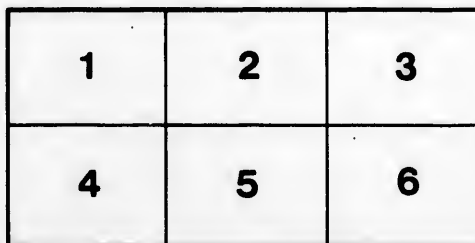
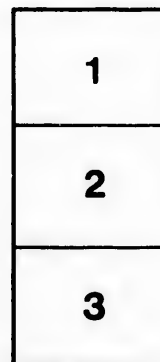
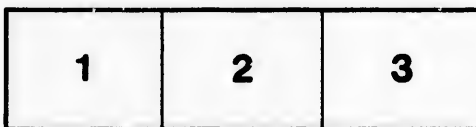
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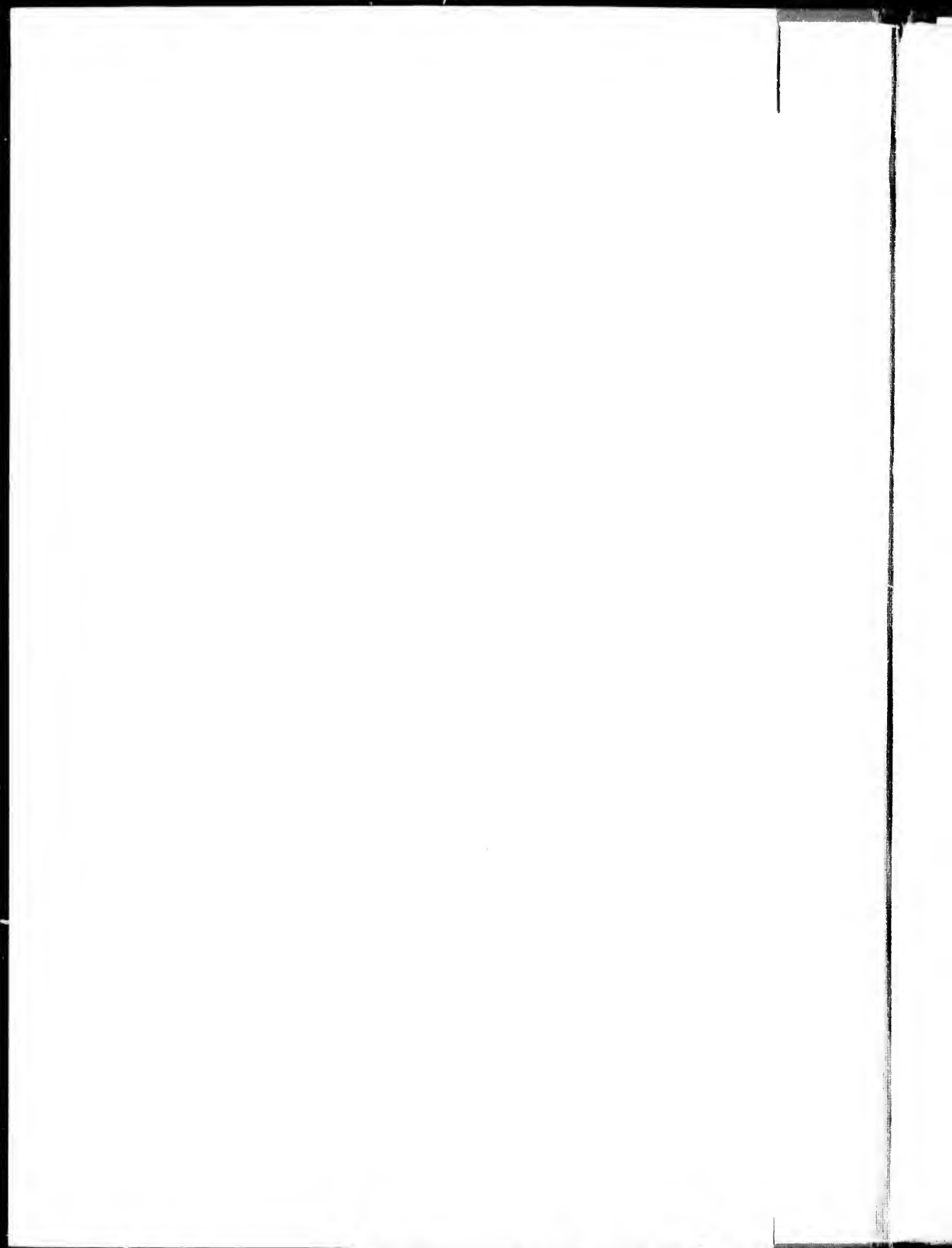
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ADLES OF THE AMERICAN ABORIGINES.

BY

OTIS T. MASON,  
*Curator of the Department of Ethnology.*

WITH NOTES ON THE ARTIFICIAL DEFORMATION OF CHILDREN  
AMONG SAVAGE AND CIVILIZED PEOPLES.

BY

DR. J. H. PORTER.

From the Report of the National Museum, 1886-'87, pages 161-235.



WASHINGTON:  
GOVERNMENT PRINTING OFFICE,  
1889.

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## CRADLES OF THE AMERICAN ABORIGINES.\*

By OTIS T. MASON.

Many questions in anthropology depend for their answer upon a correct knowledge of the manner in which the child passes the first year of its life.

It is commonly believed that the shape of the head and, indeed, of the whole frame is modified by the cradle. From time to time the National Museum at Washington has come into possession of cradles and cradle-frames from the farthest north of their limit to the farthest south. A description of these with accurate drawings is herein given in order to throw further light upon the problem.

Deformation of the head, as is well known, is both designed and undesigned. Among the Chinuks and other tribes near the mouth of the Columbia River and northward, flattening of the head was intentionally practiced in a manner to be hereafter described.

Undesigned head shaping is believed to have resulted among the Mound people as well as among our modern Indians, especially in the occipital region, from the contact of the soft and pliable head of the infant with the cradle-board or frame, even with the downy pillow.

In both Americas the majority of aboriginal children were confined in some sort of cradle from their birth until they were able to walk about. The cradle during this period serves many purposes:

- (1) It is a mere nest for the helpless infant.
- (2) It is a bed so constructed and manipulated as to enable the child to sleep either in a vertical or a horizontal position.
- (3) It is a vehicle in which the child is to be transported, chiefly on the mother's back by means of a strap over the forehead, but frequently dangling like a bundle at the saddle-bow. This function, of course, always modifies the structure of the cradle, and, indeed, may have determined its very existence among nomadic tribes.

\* I wish to express my sincere thanks to Dr. J. H. Porter for the valuable notes and references which accompany this paper.

O. T. M.

(4) It is indeed a cradle, to be hung upon the limbs to rock, answering literally to the nursery rhyme:

Rock a bye baby upon the tree top,  
When the wind blows the cradle will rock,  
When the bough bends the cradle will fall,  
Down will come baby, and cradle, and all.

(5) It is also a play-house and baby-jumper. On many, nearly all, specimens may be seen dangling objects to evoke the senses, foot-rests by means of which the little one may exercise its legs, besides other conveniences anticipatory of the child's needs.

(6) The last set of functions to which the frame is devoted are those relating to what we may call the graduation of infancy, when the papoose crawls out of its chrysalis little by little, and then abandons it altogether. The child is next seen standing partly on the mother's cincture and partly hanging to her neck or resting like a pig in a poke within the folds of her blanket.

An exhaustive treatment of this subject would include a careful study of the bed and especially of the pillow, in every instance, as well as of the frame. But collectors have been extremely careless in this regard. Very few cradles in the National Museum are accompanied with the beds and pillows. Were it not that here and there a traveler or a correspondent had made observations on the field, a hopeless lacuna would be in our way. Much remains to be done exactly at this point, and future investigators must turn their attention to this subject especially.

In this investigation much depends upon the age at which the child is placed in the cradle, the manner of bandaging and of suspending. Also there are a thousand old saws, superstitions, times and seasons, formularies, rites and customs hovering around the first year of every child's life in savagery that one should know, in order to comprehend many things attached to the cradle and its uses. Indeed, no one but an Indian mother could narrate the whole story in detail. Awaiting information from these sources, we shall describe as faithfully as possible the material now stored in the National Museum.

The method pursued in this description is that adopted in the series already begun in the report of 1884. The design is to apply the rules and methods of natural history to the inventions of mankind. We follow up the natural history of each human want or craving or occupation separately with a view to combining them into a comparative psychology as revealed in things.

Again, Bastian's study of "great areas" finds a beautiful illustration at this point in the fact that the cradle-board or frame is the child of geography and of meteorology. In the frozen North the Eskimo mother carries her infant in the hood of her parka whenever it is necessary to take it abroad. If she used a board or frame the child would perish with the cold. Indeed, the settled condition of the Eskimo does away with the necessity of such a device.

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It is somewhat difficult to mark the southern limit of the cradle frame owing to the great elevations in Mexico and middle America. The National Museum does not possess a cradle frame of any tribe living south of the northern tier of Mexican States until we cross the equator. The most southern tribes of Mexico from which specimens have come, are the Pimas, Yumas, and Yaquis. It is not here denied, however, that tribes farther south use this device.

No attempt is here made to exhaust the study of child life in savagery. All who read this paper are doubtless familiar with the work of Dr. Ploss, entitled "Das Kind."\*

The most exhaustive analysis of the subject will be found in the treatise of Dr. E. Pokrooski, of Moscow, published in the fourteenth volume of the Transactions of the Society of Friends of Natural Science, Anthropology, etc. The work is devoted especially to the different peoples of Russia. The table of contents is here appended because the volume is likely to be overlooked, and in order to show the ramifications of this interesting theme:

- Chapter I. Attention paid to the protection and development of the embryo, heredity, relations of the sexes, condition of woman, consanguine marriages, polygamy and polyandry, marriage in classical antiquity, care taken of pregnant women among ancient and modern peoples.
- Chapter II. Abortion and infanticide; motives: superstitions, fear of monsters, misery, etc.; legislation relative to abortion and infanticide.
- Chapter III. Parturition and the condition of the new born.
- Chapter IV. Care relative to the umbilical cord.
- Chapter V. Dwelling of the infant in the family of the parents.
- Chapter VI. Care of the skin.
- Chapter VII. Bathing of infants.
- Chapter VIII. Cold baths and baptism, in Europe, in Thibet, etc.
- Chapter IX. Dressing of infants among ancient peoples and modern savages.
- Chapter X. Dressing of Russian children.
- Chapter XI. Enameling (emmaillotement).
- Chapter XII. Kneading and rectification of the body of the infant.
- Chapter XIII. Artificial deformation of the skull, ancient macrocephals, deformation among modern peoples, especially in Russia, Caucasus, Poland, Lapland, etc.
- Chapter XIV. Influence of the infant's posture in its bed upon the deformation of the occiput, custom of bedding children among the Thracians, Macedonians, Germans, and Belgians of the sixteenth century, and among the modern Asiatics. The form of the occiput in Russians of the Kourgans, from the craniological collections of Moscow.
- Chapter XV. The cradle among different peoples.
- Chapter XVI. The cradles of the Russians.
- Chapter XVII. Cradles among other peoples of Russia, Taiganis, Fins, Esths, Livonians, Lapps, Poles, Jews, Lithuanians, Tchereemis, Bashkirs, Nogaï, Sarts, Kirghiz, Kalmuks, Yakuts, Burints, Tunguses, Soïotes, Woguls, Samoïdes, Goldoi, Korinks, Kamchadales, Caucasians, etc.
- Chapter XVIII. Methods of putting children in their beds, of carrying them and transporting them, dependence on climate, mode of life; bearing them on the arm, back, neck, head, hip; in bags, paniers, chests, skins, etc.; customs of the Chinese, Negroes, Hottentots, Kamchadales, Japanese, etc., in this regard.

\* Dr. H. Ploss. Das Kind in Brauch und Sitte der Völker. Anthropologische Studien. Leipzig (1884), Grieben, 2 vols., 8vo.

- Chapter XIX. Amusement of the child by the mother in Russia.  
 Chapter XX. Accustoming the child to sit and to go on all fours.  
 Chapter XXI. The upright position and walking.  
 Chapter XXII. Importance of food.  
 Chapter XXIII. Suckling among various peoples, ancient and modern.  
 Chapter XXIV. Among the Russians  
 Chapter XXV. Among other peoples of Russia.  
 Chapter XXVI. Ethnic mutilations of children: tattoo, depilation, piercing the nose, the ears, the lips, or the cheeks; filling and removing the teeth, castration, circumcision, and similar mutilations; corset, Chinese feet, high-heeled boots, etc.  
 Chapter XXVII. Games, sports, and amusements of children.  
 Chapter XXVIII. Treatment of the maladies of children among different peoples. Popular child medicine in Russia, Germany, England, Switzerland, Dalmatia, Kalmecks, Kirghiz, Caucasians, ancient Hindoos, Iranians, etc.  
 Chapter XXIX. Care relative to the corporeal development of children and the means employed to toughen and fortify them; seclusion of children, asceticism, horsemanship, physical and warlike training of children among savages, etc.  
 Chapter XXX. Rôle played by animals in the education of man—cows, goats, dogs, she-wolves, apes, etc.  
 Chapter XXXI. Physical education among the children of Russian peasants, and the results.  
 Chapter XXXII. Conclusions.

#### ESKIMO CRADLES.\*

The Hyperboreans or Eskimos skirt the Arctic coast in Greenland, Labrador, the islands north of Canada, at the mouth of the Mackenzie River, all around Alaska to Mount St. Elias. In all of these areas the mother has the hood of her skin robe or parka made very large, so as to carry therein her babe, which nestles around the mother's neck secure from the cold. (Figs. 1 and 2.) The home life of the Hyperboreans is more permanent in its character than that of the southern Indians. There is provision made in the huts of the Eskimo for any babies that may be present.

The Indians contiguous to the Eskimo in Alaska and northeastern Canada belong to the great Tinnéan or Athapasean stock. They are called Kutchin in Alaska, and in the basin of the Mackenzie River have names ending with *tenu* or *dene*, or an equivalent vocable. In the language of the Hudson Bay fur traders they bear various titles, most of

\* Lyon, Capt. G. F. (Private Journal, *i. e.* of Parry's Arctic Ex., London, 1824, 8vo), remarks that the Eskimo women of Savage Islands had large hoods for the purpose of carrying their young children stark naked against the back (p. 20). Of the Eskimo in general he says that they have "slightly bowed" legs (p. 318). Their features of the face are diversified in an extraordinary manner (p. 309). About a sixth part " \* \* \* had high Roman noses (p. 310). Everywhere the hood answers the purpose of a child's cradle (p. 315).

Rink, Dr. Henry (Danish Greenland, London, 1877, 12mo) asserts that the external curvature of the legs is general among Eskimo women of middle age, and that it is due to the cramped position in which they sit on the ledge in the hut (p. 154).

Heriot, G. (Travels through the Canadas, London, 1807, 4to) describes the "Eskimaux" women of Newfoundland as having "their enjachius \* \* \* much larger

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them terms of derision.\* The classification of the Tinné of Alaska is given by Dall.



FIG. 1.  
ESKIMO WOMAN OF POINT BARROW,  
CARRYING CHILD.  
(From photograph.)

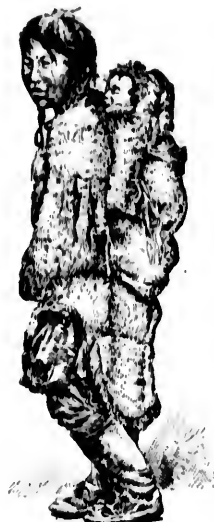


FIG. 2.  
ESKIMO WOMAN OF POINT BARROW,  
CARRYING SLEEPING CHILD.  
(From photograph.)

The Tinné tribes use some sort of device in which to lash their children during the first year. One should expect, however, to find these Indians also copying the Eskimo cradle hood,† Strachan Jones,

towards their shoulders" than those of the men, "in order to cover their children when they wish to carry them on their backs" (p. 23).

Franklin, Capt. J. (Narrative of Second Expedition, London, 1829, 4to): The same kind of hood, for the same purpose as that among the Loucheux, was seen in use among the Eskimo women near the mouth of the Mackenzie, on the Arctic coast (p. 24).  
\* Contributions to N. A. Ethnology, Bur. Ethnology, 1, 24; also The Native Tribes of Alaska, A. A. A. S., Ann Arbor, 1885.

† Cradles (Dixon's Voyage, p. 239): It might be imagined that the children of these savages would enjoy the free and unrestrained use of their limbs from their earliest infancy. This, however, is not altogether the case. Three pieces of bark are fastened together, so as to form a kind of chair. The infant, after being wrapped in furs, is put into this chair, and lashed so close that it can not alter its position even with struggling, and the chair is so contrived that when a mother wants to feed her child, or give it the breast, there is no occasion to release it from its shackles. Soft moss is used by the Indian nurse to keep her child clean; but little regard is paid to this article, and the poor infants are often terribly excoriated; nay, I have frequently seen boys of six or seven years old whose posteriors have borne evident marks of this neglect in their infancy.

Franklin, Capt. J. (Narrative of Second Expedition, London, 1828, 4to): The hood of the dress among the Lower Loucheux women is "made sufficiently wide to admit of their carrying a child on their back" (p. 28).

in his Notes on the Tinné or Chippewyan Indians, gives the figure of an infant sitting on a diminutive "bedstead," having a soft fur seat. The body of the child is bandaged to the high back of the seat. (Fig. 3.)



Fig. 3.

CHIPPEWYAN CHILD-FRAME.  
From Notes on the Tinné Indians.  
By Richardson Jones.

The same observation just made concerning the Eskimo is true of the Indians on the Upper Yukon. Dr. Dall informs me that their homes are permanent, and that there therefore is no need of the cradle-frame. The infant, if lashed at all, is fastened in a kind of coal-scuttle-shaped cradle, and at night sleeps in a hammock or on the banquette.

E. W. Nelson has sent to the Smithsonian Institution, among the many thousands of specimens collected throughout the entire western Eskimo area, the model of a trough-shaped cradle of birch bark, made from three pieces, forming, respectively, the bottom, the top and hood, and the awning. (Fig. 4.) The two pieces forming the bottom and the hood overlap an inch and a half, and are sewed together with a single basting of pine root, with stitches half an inch long. Around the bot-

tom. In Dr. Richardson's narrative of his expedition eastward from the mouth of the Mackenzie, he speaks of coast Eskimo women who "draw their children out of their wide boots, where they are accustomed to carry them naked" (1, p. 226). Franklin, Parry, Back, Richardson, and the more modern explorers, speak of the flat nose of the Eskimo. As in Oceania this may be the result of compression, since Sir John Ross (Voyage to Baffin's Bay, London, 1819, 4to) found "small straight" noses and "large aquiline" noses among the Arctic Highlanders of Prince Regent's Bay (pp. 126, 127).

Holmberg says of the Koniags (Eskimos), that the posterior part of the head is "not arched, but flat." The description of their huts and sleeping places suggests that this may be the effect of hard pillows or head-rests on an incompletely ossified skull. (Baneroff, Nat. Races of Pacific States, vol. 1, p. 72.)

Ledyard, who accompanied the expedition of Captain Cook to the North Pacific, noticed the bowed legs of the Aleuts, and attributed it to their position in the boats, in which they spend so much of their time. (Baneroff, Nat. Races of Pacific States, vol. 1, p. 88.)

Hall, C. F. (Life with the Eskimo, London, 1861, 12mo): Fac-simile of an Eskimo wood-cut showing mother and child, with position of latter in hood (vol. 1, p. 53). Plate of child in what he calls (p. 98, vol. 1) "the baby pouch" (vol. 1, p. 159). "The infant is carried naked in the mother's hood, yet in close contact with the parent's skin" (vol. 1, p. 189). Compression of head (vol. II, p. 313). This is lateral, made by the hands, and by a skin cap. But no cap could exert lateral pressure, and the words "a little skin cap placed lightly over the compressed head, which is to be kept there one year" (vol. II, p. 313), may not convey this idea.

Hearne, Samuel, in the narrative of his journey from Prince of Wales Fort, in Hudson Bay, to the Northern Ocean (London, 1795), informs us that no cradles are in use among the northern Indian tribes between 59° and 68° north. He says that the majority of the children are bow-legged from the way in which they are carried.

Portlock, in his Voyage Round the World (London, 1789), makes observations on the general distortion of the legs among Indians of Prince William's Sound (p. 248).

Kerr, Robert (Collection of Voyages and Travels, London, 1821, 8vo vol. XVI): In Cook's description of the natives of Nootka Sound, the same distortion of legs, from position in canoe, is noticed as has been before referred to. (*Id.* notes, *passim*, p.

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Ross, in describing the Eastern Tinnéh, says: \* "Among the Eastern Tinnéh, immediately after birth, without washing, the infant is laid naked on a layer of moss in a bag made of leather, and lined with hare-skins. It is the summer the latter are dispensed with. This bag is then securely laced, restraining the limbs in natural positions, and leaving the child freedom to move the head only. In this phase of its existence it resembles strongly an Egyptian mummy." Cradles are never used; but this machine, called a "moss bag," is an excellent adjunct to the rearing of children up to a certain age, and has become almost if not universally adopted in the families of the Hudson Bay Company's employes. The natives retain the use of the bag to a late period, say until the child passes a year, during which time it is never taken out except to change the moss. To this practice, continued to such an age, I attribute the turned toes and rather crooked legs of many of these Indians. One is somewhat reminded by this process of the Eskimo sleeping-bag. In the National collection are several small bags of the same pattern, but the label does not authorize the conclusion that these small bags were used as cradles for infants.

Bordering the Eskimo in the Labrador Peninsula live the Naskopi or Seoffies, in latitude as far north as 53 degrees. Lucien Turner spent two years among them, and has collected much precious information. He tells us that when the Naskopi child is born it is not washed or allowed to be made of a piece of leather. . . . Some moss is laid in the bottom of this bag, the child is laid into it, and moss is inserted between its legs. The bag is then laced to the fore side of the child as high as its neck. This bag is laid upon a board, to which it is fastened by means of a strip of leather" (p. 316). Further details of arrangement, ornamentation, and nursing (pp. 316, 317).

Mackenzie, Sir A. (Voyages from Montreal to the Frozen and Pacific Oceans, London, 1801, 4to); Descriptive of the "swaddling-board" used by the Beaver Indians (p. 119).

N. B.—This board, about 2 feet long, covered with a bed of moss, to which it (the child) is fastened by bandages "was in use in a sub-arctic climate". Equally opposed to Hearn's statement concerning the absence of cradles in these regions is Mackenzie's full description of a board cradle "in which the child, after it had been swathed, is placed on a bed of moss." Head compression practiced here, i. e., near Northwest coast; tribe not named (p. 371). It is to be remarked that Mackenzie speaks of this last as a "*new kind of cradle*," the inference being that the Beaver "swaddling-board" was used by the Chippewa, Kuisteneaux, Assiniboines, etc.

Fitz William (Northwest Passage by Land, p. 85) says that the cradle is "a board with two side flaps of cloth, which lace together up the center. The child is laid on its back on the board, packed with soft moss, and laced firmly down with its arms to its sides, and only the head at liberty. The cradle is slung on the back of the mother when traveling, or reared against a tree when resting in camp, the child being only occasionally released from bondage for a few moments. The little prisoners are remarkably good; no squalling disturbs an Indian camp."

Whympier (Alaska, p. 229): "The Tenan Kutchim (Tinnéh) children are carried in small chairs made of birch bark." Richardson (Journal 1, 381) makes the same statement. Bancroft (Nat. Races, etc. 1, 131) says: "The women carry their infants in a sort of bark saddle, fastened to the back; they bandage their feet in order to make them small."

\* Smithsonian Report, 1856, p. 302.

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\* "Among the Eastern Indians, the infant is laid in a bag, and lined with hare's wool, and is wrapped with. This bag is in various natural positions, and is used in this phase of its infancy." Cradles are made of the bag to a late age, and has become a practice, continued to rather crooked legs of the Hudson Bay Indians, which time it is never removed by this process of attention are several small authorize the conclusion of infants.

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much) children are carried al t. 381) makes the same women carry their infants age their feet in order to

take the breast until three days have elapsed; it is considered to weaken the infant if permitted to take the breast before that time. The mother prepares sphagnum moss by beating it until it becomes quite soft and fluffy. A portion of this moss is placed about the child, and it is then wrapped in clothes or skins. The swaddling process begins at the feet and wraps the lower limbs close together; the trunk is also swathed as far as the neck, until the child resembles a cocoon. At earliest infancy the arms are wrapped next the body, but when several months old those limbs are free, except at night. The reason of this is to make them grow straight and afford the mother convenience in handling them when on a journey, or to prevent them from rolling about the tent and into the fire. The bandages are removed once a day and a clean quantity of moss supplied. Water is never given to the child to drink until it is old enough to help itself—an occasion of remark among the women—for it marks an event in the infant's life.

Figure 5 is from a sketch in the Century Magazine, taken at Cape Breton, and gives us an excellent example of the combinations which



FIG. 5.

CHILD IN HAMMOCK. CAPE BRETON.

From sketch in Century Magazine.

civilization entails. The wigwam is to the manner horn, the hammock reminds one of the far south, while the baby, ensconced in fur and blankets, without a pretense of lashing, points to Eskimo as well as white man's methods. Dr. Dall's remark about the Alaska Indian fashion of the hammock may be recalled here.

On the Pacific side of the Rocky Mountains appear in turn the Kolo shan, the Haidan, Hailtzukan (Quackiool), Salishan, Wakashan, or Nutkan stock. All of these people are more or less the slaves in all



*B. Isella*

their arts to the splendid forests of pine and cedar which cover their lands. The Bellachoola or Bilkhula belong to the great Salishan stock. Their home is in the vicinity of Bentinek Arm. The cradle of this people is probably a fair sample of that used by the stocks north and south of the Bilkhulas (Fig. 6). It is a trough-shaped frame of cedar wood made in two pieces, as follows: The bottom and head-board are in one piece about one-half or three-quarters inch thick. The two sides and foot are also in one piece. The angles and the bends near the child's knees are effected by searing the wood almost through on the inside and boiling and bending it into shape. In this art these Indians are very expert, making great numbers of boxes for food and clothing, with



Fig. 6.

## BELLA COOLET TROUGH CRADLE.

(Cat. No. 26556, U. S. N. M., Bellachoola, B. C. Collected by James G. Swan.)

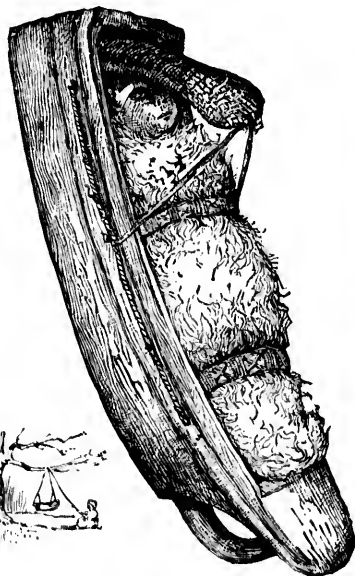


Fig. 7.

## DUGOUT CRADLE, WITH HEAD-FLATTENING APPARATUS.

(Cat. No. 2574 B, U. S. N. M., Chinuk Indians. Collected by George Catlin.)

joints invisible on the outside. The joints of this cradle are united by means of small withes of willow. The characteristic marks are a flat bottom; head-board, like a little grave-stone, painted in red and black with conventional symbol of a totem. Two streaks of red paint skirt the upper margin of the sides. The change in the angle of convergence of the sides near the child is effected by searing and bending. The bed consists of a mass of finely shredded cedar bark. This is overlaid with some kind of sheet of cloth or fur, and the lashing passes through

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Fig. 7.  
WITH HEAD-FLATTENING  
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N. M. Chinuk Indians. Collected by  
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holes in flaps of raw-hide, in place of the series of eyelet loops occurring on cradles farther south.

In the commencement of this article two kinds of deformation were mentioned, the designed and the undesigned. The first-mentioned method is found in British Columbia, on its western border, and in our domain along the coast of Washington and Oregon. On the extreme north-west corner of Washington live the Makahs, a people associated with the Ahts on Vancouver Island, and belonging to the Nutkan or Wakashan stock. Living as they do in the great cedar region, their cradle would naturally be similar to those of the Indians living farther north.

It is a trough rudely hewed out of cedar wood. (Fig. 7.) A low bridge is left across the trough to strengthen it. Slats are put across to level of height of bridge. The bedding consists of mats of cedar bark. On the lower end of the cradle is a handle. Around the sides are fastened strings. The compress is fastened to head of cradle. It curves over and is tightened by means of cords to the sides of the cradle. It is woven of, and stuffed tightly with, cedar bark. These cradles are suspended by strings to pliant poles, swung by the mother with her hand or great toe.

Another cradle-trough in the National Museum, said to have come from Oregon Territory, is a block of cedar wood 30 inches long and 12 inches square, roughly hewn in shape of a boat, with bulging sides. At the foot, on the outside, is carved a handle, function not known. The bed is shredded cedar bark, and the covering a quilt of the same material, roughly held together by twined weaving; a long pad is hinged to the head-board, and so arranged as to be drawn down over the child's forehead and lashed to either side of the trough. There is evident connection between the boats of the Northwest and the cradles. An interesting feature about this form of cradle is the appliances for lashing the child:

(1) A series of holes along the side, just below the margin, parallel with the border most of the way, but sloping quite away from it at the head.

(2) A cord of coarse root laid along over these holes on the outside of the cradles.

(3) On either side the standard series of loops for the lacing-string is formed by passing a twine through the first hole, around the root cord on the outside, back through the same hole up to the middle of the cradle to form a loop, back through the next hole in the same manner.

(4) The lacing-string runs through these loops alternately from bottom to top. The ornamentation of this type of cradle is chiefly by means of parti-colored basketry and furs. The Chinuks were an advanced people in art, and many of their cradles were very prettily adorned. Mr. Catlin figured one in which the process of head-flattening is going forward.

In Mayne's "British Columbia and Vancouver's Island" we read that

the child lies at full length, and the sides of the cradle are sufficiently high to enable the mother to lace it in by a cord passed from side to side, a small block being put at one end as a pillow. When the mother is traveling she carries the cradle on her back in nearly an upright position, with the head appearing just above her shoulders. But if she is working she suspends the infant from the pliant branch of a tree, or, sticking the pole in the ground at a slight angle, hangs the cradle, sometimes upright, sometimes horizontally, on the end of it. They move pole and cradle so as to keep it near them, and every now and then give it a swing so that it rocks up and down. It is said that when children die they are put in some lake or pool, in their cradle, and left to float, the water being regarded as sacred ever after.

Swan, in his "Indians of Cape Flattery,"\* says: "The practice of flattening the heads of infants, although not universal among the Makahs, is performed in a manner similar to that of the Chinuks and other tribes in the vicinity of the Columbia River. As soon as a child is born it is washed with warm urine, and then smeared with whale oil and placed in a cradle made of bark, woven basket fashion, or of wood, either cedar or alder, hollowed out for the purpose. Into the cradle a quantity of finely separated cedar bark of the softest texture is first thrown. At the foot is a board raised at an angle of about 25 degrees, which serves to keep the child's feet elevated, or when the cradle is raised to allow the child to nurse, to form a support for the body, or a sort of seat. This is also covered with bark (he-sé-yu). A pillow is formed of the same material, just high enough to keep the head in its natural position, with the spinal column neither elevated nor depressed. First the child is laid on its back, its legs properly extended, its arms put close to its sides, and a covering either of bark or cloth laid over it; and then, commencing at the feet, the whole body is firmly laced up, so that it has no chance to move in the least. When the body is well secured, a padding of he-sé-yu is placed on the child's forehead, over which is laid bark of a somewhat stiffer texture, and the head is firmly lashed down to the sides of the cradle; thus the infant remains, seldom taken out more than once a day while it is very young, and then only to wash it and dry its bedding. The male children have a small opening left in the covering, through which the penis protrudes, to enable them to void their urine. The same style of cradle appears to be used whether it is intended to compress the skull or not, and that deformity is accomplished by drawing the strings of the head-pad tightly and keeping up the pressure for a long time. Children are usually kept in these cradles till they are a year old, but as their growth advances they are not tied up quite so long as for the first few months. The mother, in washing her child, seldom takes the trouble to heat water; she simply fills her mouth with water, and when she thinks it warm enough spirts it on the child and rubs it with her hand."

\*Smithsonian Contr. to Knowledge, No. 220, pp. 18-19.

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Inhabiting the lower parts of the Columbia are a small tribe who cor-  
 rectly come under the name of Flat Heads, as they are almost the only  
 people who strictly adhere to the custom of squeezin, and flattening the  
 head.

The process of flattening consists in placing the infant on a board,  
 to which it is lashed by means of thongs to a position from which  
 it can not escape, and the back of the head supported by a sort of  
 pillow, made of moss or rabbit-skins, with an inclined piece (as seen  
 in the drawing), resting on the forehead of the child, being every  
 day drawn down a little tighter by means of a cord, which holds it in  
 its place until it at length touches the nose, thus forming a straight  
 line from the crown of the head to the end of the nose. This process  
 is seemingly a very cruel one, though I doubt if it causes much pain,  
 as it is done in earliest infancy, while the bones are soft and easily de-  
 pressed into this distorted shape, by forcing the occipital up and the  
 frontal down.



Fig. 8.

FLAT HEAD WOMAN AND CHILD.

(Showing the manner in which the heads of the children are flattened.)

The skull at the top in profile will show a breadth of not more than 1½  
 or 2 inches, when in front view it exhibits a great expansion on the  
 sides, making it at the top nearly the width of one and a half natural  
 heads.

By this remarkable operation the brain is singularly changed from  
 its natural shape, but in all probability not in the least diminished  
 or injured in its natural functions. This belief is drawn from the tes-  
 timony of many credible witnesses who have closely scrutinized them  
 and ascertained that those who have the head flattened are in no way  
 inferior in intellectual powers to those whose heads are in their natural  
 shape.

In the process of flattening the head there is another form of cradle or cradle into which the child is placed, much in the form of a small canoe, dug out of a log of wood, with a cavity just large enough to admit the body of the child and the head also, giving it room to expand in width, while from the head of the cradle there is a sort of lever, with an elastic spring, that comes down on the forehead of the child and produces the same effect as the one I have described. The child is wrapped in rabbit-skins and placed in this little coffin-like cradle, from which it is not in some instances taken out for several weeks.

The bandages over and about the lower limbs are loose and repeatedly taken off in the same day, as the child may require cleansing. But the head and shoulders are kept strictly in the same position, and the breast

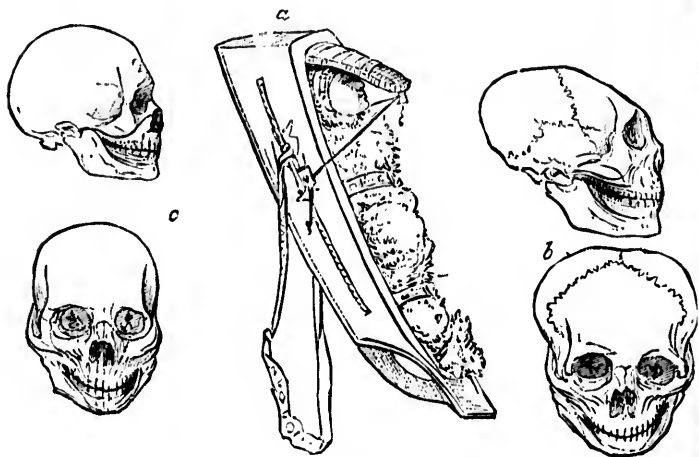


Fig. 8a.

THE CHINUK METHOD OF FLATTENING THE HEAD.  
(Plate 2104, Vol. II, Catlin's Eight Years.)

given to the child by holding it up in the cradle, loosing the outer end of the lever that comes over the nose and raising it up or turning it aside so as to allow the child to come at the breast without moving its head. The length of time that the infants are carried in these cradles is three, five, or eight weeks, until the bones are so formed as to keep their shape.

This cradle has a strap that passes over the woman's forehead while the cradle rides upon her back, and if the child dies during its subjection to this rigid mode its cradle becomes its coffin, forming a little canoe, in which it lies floating on the water in some sacred pool. (Catlin, vol. II, p. 110.)

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From the Oregon coast the Wilkes Expedition\* brought a cradle which is shown in Fig. 9. The frame board is trowel or spade sharp. The whole back and front are covered with buckskin. At a proper distance from the edges, the buckskin is sewed or lashed down, and the flaps form the inclosing wrappings of the child. A triangular "fly" covers the lower extremities. Compare this portion of the cradle with the Nez Percés (Sahaptian) cradle described further on. The hood is of rawhide, overlaid with a cover of headed buckskin. It can readily be seen that this hood may be drawn to any tension across the forehead of the infant. The ornamentation and the head-band or carrying-strap are similar to the same parts in other cradles. Wilkes (Explor. Exped., IV, 388) says: "At Nienlita Mr. Drayton obtained a drawing of a child's head that had just been released from its bandages, in order to secure its flattened appearance. Both parents showed great delight at the success they had met with in effecting this distortion." (See Fig. 10.)



FIG. 9.  
 CRADLE OF OREGON INDIANS.  
 (Cat. No. 275, U. S. N. M. Collected by Wilkes' Exploring Expedition.)

\* Marchand (Voyages) reports that among the Thinkets, infants are "so excoiated by fermented filth, and so scorred by their eradle, that they carry the marks to the grave." (Baneroft, Nat. Races of Pacific States, vol. 1, p. 112.)

Lord (Nat., vol. 11, p. 232), Scouler (Lond. Geog. Soc. Jour., vol. XI, pp. 218, 220, 223), Schoolcraft (Arch., vol. 11, p. 325) mention the custom of flattening the head in infancy among the Haidahs (Columbians). (Baneroft, Nat. Races, etc., I, 158.) In their platform houses they slept on "cedar mats" (p. 161).

Baneroft (Native Races of the Pacific States, N. Y., 1875, vol. 1): "The custom of flattening the head is practiced by the Nootkas in common with the Sound and Chinook families, but is not universal" (p. 180. See, also, note, p. 58).

Baneroft (Native Races of the Pacific States, N. Y., 1875, vol. 1, note, p. 177) quotes the accounts of Cook, Meares, Mofras, Macfie Poole, Sutifly Mexicana, Mayne, and Scouler, to the effect that the Nootka Indians are bow-legged and intoed from boat work, and have deformed limbs from the effect of garters.

Swan, J. G. (Indians of Cape Flattery, Smithsonian Contributions, No. 220): Description of the process of head-flattening among the Indians of Vancouver Island (pp. 18, 19).

Heriot, G. (Travels through the Canadas, London, 1807, 4to): "In the latitude of fifty-two degrees, on the northwest coast of America, there exists a tribe whose heads are molded into a wedge-like form" (p. 303).

Baneroft (Native Races of the Pacific States, N. Y., 1875, vol. 1): The custom of head-flattening, apparently of sea-board origin and growth, extends \* \* \* across



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Governor Stevens (Ind. Aff. Rep., 1854, p. 227) says: "The women at Walla Walla sit astride in a saddle made with a very high pommel and

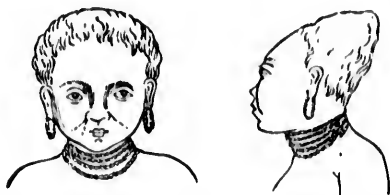


Fig. 10.

SHOWING THE EFFECT OF HEAD-FLATTENING.

From drawing by Mr. Drayton, published in Wilkes' Exploring Expedition, vol. 13, p. 388.

cattle, and in traveling carry their infants either dangling by the cradle strap to the former or slung in a blanket over their shoulders." The the Cascade barrier, and is practiced to a greater or less extent by all the tribes of the Sahaptian family." They merely depress slightly the forehead of infants, and this disappears at maturity" (p. 256).

Maclie, M. (Vancouver Island and British Columbia, London, 1865): Between lat. 53° 30' N. and lat. 46° N. the Indians of the northwest coast of America flatten the head, under the impression that the distortion is becoming (p. 411).

Maclie (*idem.*, p. 411) gives the following account of the process of head-flattening among the coast tribes: "The child, as soon as born, is placed in a cradle scooped out of a log of timber. This rude ark is flat at the bottom, and raised at the point where the neck of the child rests. A flat stone is fastened to the head of the infant in this posture by thin strips of twisted bark. In the situation indicated the child is kept till able to walk, and its forehead has been molded into the required shape." In the Quatsino district the skulls of the women have "a tapering or conical form" \* \* \* produced by artificial means. Only the families of chiefs (tenass and "gentlemen commoners" (tyheers) are permitted to modify the form of the head.

Bancroft (Native Races of the Pacific States, N. Y., 1875, vol. 1): The Sound Indians, among the Columbians, flatten the head, "but none carry the practice to such an extent as their neighbors on the south" (p. 210).

Bancroft (Native Races of the Pacific States, N. Y., 1875, vol. 1): Among the Chinooks the "legs are bowed and otherwise deformed by a constant squatting position in and out of their canoes" (p. 224). Head-flattening "seems to have originated \* \* \* about the mouth of the Columbia," and the Chinooks carry the custom to an excess of deformity (p. 226).

Bancroft remarks that "the Chinook ideal of facial beauty is a straight line from the end of the nose to the crown of the head. The flattening of the skull is effected by binding the infant to its cradle immediately after birth, and keeping it there from three months to a year. The simplest form of cradle is a piece of board or plank, on which the child is laid upon its back with its head slightly raised by a block of wood. Another piece of wood, or bark, or leather is then placed over the forehead and tied to the plank with strings, which are tightened more and more each day until the skull is shaped to the required pattern. Space is left for lateral expansion, and, under ordinary circumstances, the child's head is not allowed to leave its position until the process is complete. The body and limbs are also bound to the cradle, but more loosely, by bandages, which are sometimes removed for cleansing purposes. (Native Races, etc., vol. 1, p. 227.)

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FIG. 1.  
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dia, London, 1865): Between Northwest coast of America flatten becoming (p. 411).

of the process of head-flattening as born, is placed in a cradle at the bottom, and raised at the top is fastened to the head of the In the situation indicated the men molded into the required form have "a tapering or conical" the families of chiefs (tenass) d to modify the form of the

1875, vol. 1): The Sound Indians carry the practice to such

Y., 1875, vol. 1): Among the flattened by a constant squatting position "seems to have originated and the Chinooks carry the cus-

l beauty is a straight line from the flattening of the skull is effected by the cradle, and keeping it there from is a piece of board or plank, on which is slightly raised by a block of wood, then placed over the forehead and pushed more and more each day until the head is flattened to the left for lateral expansion, and allowed to leave its position and is also bound to the cradle, but is moved for cleansing purposes."

same authority says that the Challoms, and in fact all the Sound Indians, flatten the head (243).\*

Mr. William Meunold, in sending to the National Museum the skull of a Flathead Indian from northwest Montana, writes as follows: "When the child is about one week old it is put on a board and tied hand and foot. A small bag of sand is tied over the forehead and remains in this position eight or ten days. It is then taken off for a short rest and afterwards fastened to the board again. This continues from six weeks to six months. The head then has its shape and grows in the right direction. The skull mentioned belonged to Redgrass, a chief, who died about forty years ago. His body was deposited on posts 6 feet high. In his canoe were found beads, and a General Harrison badge of 1841."

\* Meares, J. (Voyages to the Northwest Coast of America, London, 1791, 8vo), describes the compression of head into the form of a "sugar loaf" among Indians of Nootka Sound by bandages. Says the process flattens the nose (vol. II, p. 37).

Wilkes, Commander (U. S. Exploring Expedition, Philadelphia, 1845, 4to, vol. IV): Two plates illustrating head-flattening among the Indians of Nieuwita (Wallawalla), observed by Mr. Drayton (p. 415). Flower quotes Kane's description of the process of head-compression in Vancouver (p. 13). He refers to evident distortion in the case of an order of Chinese mendicants, as indicated by plate 131, vol. II, *Picart, Histoire des Religions*. He quotes Townsend's account of head-flattening among the Wallawalls (p. 14).

Catlin, George. (Illustrations of the Manners, etc., of the N. Amer. Indians. London, 1876, 8vo, vol. I.) Head of Crow chief distorted into semi-lunar shape, with compression of forehead (p. 50). Vol. II. Head-flattening among Chinooks. Description of cradle and process (pp. 110, 111). Statement concerning the former prevalence of this custom among Choctaws and Chickasaws (p. 112). The evidence afforded by this and other works dealing with the details of life points to the fact that head distortion is less practiced now than formerly. It exists at present sporadically.

Cox, R. (The Columbia River. London, 1832, 3d ed. 8vo.) On the Lower Columbia all heads were distorted; and there was a perfect uniformity in their shape (vol. I, pp. 105, 106). Speaking of "Flatheads," says, their "heads have their fair proportion of rotundity" (I, pp. 219-222). Gathlamahs, Killymucks, Clatsops, Chinooks, Chilts, at mouth of Columbia, flatten the head. Cradle oblong, with pillow. Pad and slab on forehead held by cords. Time, a year. No pain (vol. I, page 276). Among this group of tribes the body and limbs among the men well shaped, but the women's legs are "quite bandy," owing to the tight ligatures they wear on the lower part of the legs (vol. I, p. 276).

Wood, J. G. (Uncivilized Races of Men. Hartford, 1871, 8vo.) Description of the process of head-flattening among the Columbia Indians (pp. 1319, 1320).

Lewis and Clark. (Expedition to the Sources of the Missouri, etc. Philadelphia, 1814, 8vo.) On the Kimoosim, an allment of the Columbia, "the Sokulk women" had "their heads flattened in such a manner that the forehead is in a straight line from the nose to the crown of the head" (vol. II, p. 12). The women of the Pishquit-paws, on the Columbia, had "their heads flattened" (vol. II, p. 23). Among the Ene-shars and Ele-seloots "the heads of the males, as well as of the other sex," were flattened (vol. II, p. 45). The women of an unnamed tribe on the same river "universally have their heads flattened," and they saw "female children undergoing the operation" (vol. II, p. 57). Pressure of anklets and mode of sitting also distorted their legs (*id.*). "The Skilltoots, both males and females, have the head flattened" (vol. II, p. 64). The Walkmenms "all have their heads flattened" (vol. II, p. 63). Head-flattening is general among the "Chimooks." Men's legs "small and crooked; women's tanned

The Hupa Indians of northwestern California belong to the Tinnear colored stock. They have been described in a paper entitled, "The Ray Col There lection in the U. S. National Museum."\* The cradle-basket of the Hupa the Met the northwestern California is a slipper shaped, open work basket of type. It consists of osier warp, and twined weaving constitutes the body of the cradle (Fig. 11.) It is woven as follows. There a Commencing at the upper end, the small ends of the twigs are held in ply brai half tur place one eighth of an inch apart by three rows of twined weaving. The g heel, wh sharper is, the r heel, wh Around border r The twi and are The M work, e; at the e the bac standing sol. In spirally loped ha eyes, in long th start to pride of around even th From casual 45 degre years of



Fig. 11.

## HUPA WICKER CRADLE.

\*Cat. No. 12631b, U. S. N. M., Hupa Valley, California. Collected by Lieut. F. H. Ray, U. S. A.

When two rows of this kind of twining lie quite close it has the appearance of a four-ply plaiting, and has been taken for such by the superficial observer.

The binding around the opening of the cradle is formed of a bundle of twigs seized with a strip of bast or tough root.

The awning is made of open wicker and twined basketry, bound with

by pressure of head anklets (vol. II, p. 115). The Cookoooose, on the Pacific coast, does not flatten the head (vol. II, p. 119). It is stated that "the Killamucks, Clatsops, Chinooks and Cathlamahs \* \* \* have thick ankles and crooked legs" due to "the universal practice of squatting, \* \* \* and also to the tight bandages of bands and strings worn around the ankles by the women," whose limbs are "particularly ill-shaped and swollen." "The custom \* \* \* of flattening the head by artificial pressure during infancy, prevails among all the nations we have seen west of the Rocky Mountains" (Snakes and Cookoooose they themselves except). "To the east of that barrier the fashion is \* \* \* perfectly unknown." An error! "On the lower parts of the Columbia both sexes are universally flatheads; the custom diminishes in receding eastward, \* \* \* till among the remoter tribes, near the mountains," the practice "is confined to a few females" (vol. II, pp. 130, 131).

\* Smithsonian Report, 1886, i., pp. 205-239, pl. XXVI.

nia belong to the Timéa  
r entitled, "The Ray Col  
cradle-basket of the Hupa  
ped, open work basket of  
arp, and twined weaving  
ates the body of the cradle  
) It is woven as follows  
neing at the upper end, the  
ods of the twigs are held in  
e eighth of an inch apart  
e rows of twined weaving  
l by a row in which an ex  
ngthening twig is whipped  
d in place, as in the Makal  
y. At intervals of 2½ to 3  
are three rows of twined  
y, every alternate series  
one of the strengthenin  
increasing in thickness  
ard. The twigs constitut  
the bottom of the so calle  
continue to the end of the  
toe, and are fastened off  
hose that form the sides  
eously bent to form the  
f the slipper. This part  
e is held together by row  
d weaving (*houstrophedon*  
two rows of this kind  
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e remoter tribes, near the mount  
l. II, pp. 130, 131).

colored grass. This pretty, flat cone resembles the salmon-baskets figured and described in the Ray collection.\*

There is in the National Museum a cradle for a new-born babe, from the McCloud River Indians of California, belonging to the basket-tray type. It is shaped very much like a large grain-scoop or the lower half of a moccasin inverted, and made of twigs in twined weaving. There are double rows of twining two inches or thereabouts apart, and nearly all of them are interlocked, which gives the appearance of a four-ply braid. The meshes form a diamond pattern by inclusion in the half turns of the twine quincernally.

The general shoe-shape of the cradle is produced by commencing at the heel, which is here the bottom, and doubling the twigs by a continually sharper turn until along the bottom the rods simply lie parallel, that is, the rods that lie along the middle of the bottom terminate at the heel, while those that form the sides and upper end are continuous.

Around the edge and forming a brace across the upper end is a border made of a bundle of rods seized with tough bast or splic root.† The twigs themselves project upwards an inch or two from this brace, and are not fastened off. (Figs. 11 and 12.)

The Modoc women make a very pretty baby-basket of fine willow-work, cylinder-shaped, with one-half of it cut away, except a few inches at the ends ‡ It is intended to be set up against the wall or carried on the back; hence the infant is lashed perpendicular in it, with his feet standing in one end and the other covering his head, like a small parasol. In one that I saw this canopy was supported by small standards, spirally wrapped with strips of gay-colored calico, with looped and scalloped hangings between. Let a mother black her whole face below the eyes, including the nose, shining black, thrust a goose quill 3 inches long through the septum of the nose, don her close-fitting skull cap and start to town with her baby-basket lashed to her back, and she feels the pride of maternity strong within her. The little fellow is wrapped all around like a mummy, with nothing visible but his head, and sometimes even that is bandaged back tight, so that he may sleep standing.

From the manner in which the tender skull is thus bandaged back it occasionally results that it grows backward and upward at an angle of about 45 degrees. Among the Klamath Lake Indians I have seen a man fifty years old, perhaps, whose forehead was all gone, the head sloping right

\* Perouse, G. de la. (Voyage Round the World. London, 1799. 8vo. Vol. III.) Description by Dr. Rollin of the manner of swathing infants and of the cradles used by the California Indians (p. 269). Almost the same statement is made of the treatment of infants among the Tartars of the east coast, opposite Saghalien. Their cradles were of basket work, wood or birch bark (p. 237).

† Bancroft. (Native Races of the Pacific States. New York, 1873. Vol. I.) Among the central Californian tribes, "as soon as the child is born" it is washed "and then swaddled from head to foot in strips of soft skin and strapped to a board, which is carried on the mother's back" (p. 391).

‡ Powers, Cont. N. A. Ethnol., III, p. 257.

back on a line with the nose, yet his faculties seemed nowise impaired. The conspicuous painstaking which the Modoc squaw spends on her baby-basket is an index of her maternal love. Indeed the Modoc is strongly attached to their offspring. On the other hand a California squaw often carelessly sets her baby in a deep conical basket, the sides of which she carried her household effects, leaving him loose and liable to fall out. If she makes a baby-basket it is totally devoid of ornament, and one tribe, the Mi-woh, contemptuously call it the dog's nest. It is among Indians like these that we hear of infanticide.

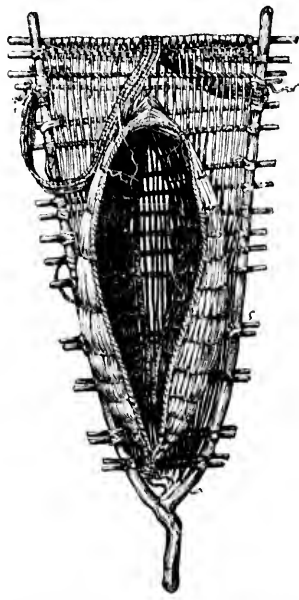


Fig. 12.

KLAMATH CRADLE OF WICKER AND BUSHES.  
Cat. No. 19028, U. S. N. M., Klamath Indians, Umpqua River,  
California. Collected by Stephen Powers.



Fig. 13.

FRAME OF PITT RIVER CRADLE.  
Cat. No. 21111, Bureau of Ethnology, U. S. N. M., Collected by Stephen Powers.

The cradle of the Pitt River Indians is a transition between the fork-stick and the ox-bow type. A pole of wood, with bark removed, is laid in the middle, the two ends crossed and lashed together. Across this primitive frame are laid broad laths, perforated at the corners, and lashed to the poles with buckskin strings (Fig. 13). The foot-rest is a block of wood 7 by 4 by 3 inches, perforated, and through it are passed the two ends of the pole. The convergence of the ends prevents the slipping down of this little platform. Comparing this cradle with one of the Long in the vicinity, called a cradle of a new-born pappoose, it will be seen that we have before us two extremes of a series, commencing with a nest-tray for an absolutely helpless creature to a standing place for a child.

ulties seemed nowise impaired. The Modoc squaw spends on love. Indeed the Modoc on the other hand a Californian deep conical basket, the same, leaving him loose and liable to it is totally devoid of ornament. It is called the dog's ear and is aptly named, for it is a near neighbor of infanticide.

st ready to learn to walk. Regarding the cradle in the light of a chrysalis, we discover not only the tiny creature within has passed through wonderful changes, but that the encapsulating cradle has passed from a horizontal to a vertical function. It was first a trough to be firmly lashed in; it ends with being a frame on which the juvenile Indian takes his stand prior to taking his flight into the realm of self-support. Compare this device with the practice of the Pimo and Yuma children of standing upon the mother's cinchure and grasping her neck and shoulders. Another Pitt River example is a cradle net or bag, the warp of coarse twine of milkweed fiber laid close together and joined by twined weaving of finer twine, in double rows, an inch and a half apart. Some noteworthy features of this cradle are the following: the whole twining, from beginning to end, seems to be continuous, like a series of double furrows. On the right edge the weaver simply turned and weaved back alongside of the former twine; at the left she laid her twine by the side of her warp for an inch and a half, and then turned in for another double row. Indeed, it seems as though the whole cradle were made of one pair of twines. The hood is made by puckering the ends of the warp together and tying them, as with a g-string. The part over the forehead is formed of a separate set of warp strands. The sun-shade is a round, disk-like structure of twined weaving.

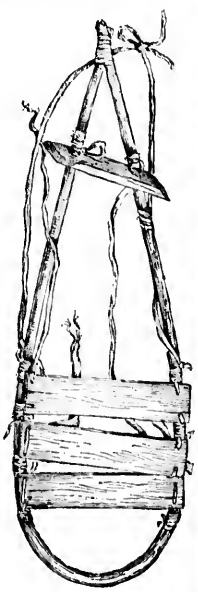


Fig. 13.

FRAME OF PITT RIVER CRADLE  
 (Cat. No. 2141), Round Valley, California  
 U. S. N. M. Collected by Stephen Powers.

The Potter Valley cradle-trough is made of willow twigs laid closely together and held in place by an ingenious stitching, to be explained later on (Fig. 14).

The head of the cradle is a hoop of wood 1 foot in diameter, quite even. It is fastened to the wicker-work by a continuous coil of twine going around it and between the willow rods consecutively, being caught over the curious braid that holds the twigs together. In the sample described the lashing is cotton string, but in a more primitive form it would be sinew or grass cord. The ends of the twigs are cut flush with the hoop. The sides and bottom of the cradle are scooped, with high perpendicular sides, the twigs forming it all terminating at the head hoop.

The rods of the cradle-frame are woven together by a series of braids about 2 inches apart. This braid is so constructed as to resemble two rows of coiled sewing on the inside and a close herring-bone on the outside, and is made as follows: Commence one edge and carry the twine along three osiers, bending to the left, bringing it back two and through the front, forward two, crossing number one; through, back two, through to front, just over and over, forward three, back two, forward two, back two, ready to start again.

Long leather loops are attached to the bottom of the cradle where it meets the upright sides to receive the lacing-string which holds the frame in place.

The Tule and Tejon cradle-frame consists of three parts: the founda-

a transition between the foot-boards, with bark removed, is lashed together. Across the cradle at the corners, and lashed to the foot-boards (Fig. 13). The foot-rest is a block of wood through it are passed the ends prevents the cradle from sagging this cradle with one foot in pappoose, it will be seen in the series, commencing with a nail to a standing place for a cradle.

tion, which is a forked stick; the cross-bars, lashed beneath, and the transverse rods, which are made of a single flat of twigs upon which the bed is laid. Some parts of this frame demand a more minute description. The fork is a common twig, not necessarily symmetrical, with short handle and prongs nearly 3 feet long, spreading about 16 inches at the distal end or top.

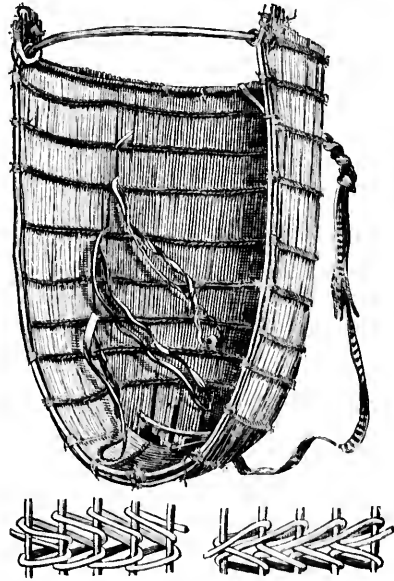


Fig. 14.

POMO CRADLE. THE CHILD SITS IN THE ROUNDED PORTION.

(Cat. No. 21398. U. S. N. M. Forter Valley, California. Collected by Stephen Powers.)

At the back of the fork are lashed seventeen rods of wood, projecting at their ends an inch or more beyond the fork. The lashing of the rods to the fork is by means of sinew skillfully crossed both in front and rear, that is, the seizing is partly parallel and partly cross-laced to give the strongest joint. These wooden rods seem to follow a rude plaistrap-pairs, but the design is not apparent. Between the upper pair is laid a third rod, whose function is to hold in place the slats in front. The slats or slat-work on the front consist of a separate transverse rod, the middle of which about forty twigs are attached by bending the large end of each one around the rod and then holding the series in place by a row of two of twined weaving with split twigs. To fasten this crib-work in place the rod is put behind the two ends of the forked stick, and the twigs laid in order on the front of the series of transverse rods so as to fill neatly the space between the forks. These twigs are held in place by lashing them here and there to the transverse rods and to the slong,

bars, lashed beneath, and the prongs. This lashing crosses the twigs diagonally in front and the back. Some parts of this frame are rods behind vertically. The Mohave cradle-frame is a prettily-made ladder or trellis, built of rods nearly 3 feet long, as follows (Fig. 15): A pole of hard wood about 7 feet long is bent into an arch at top or bottom.



THE ROUNDED PORTION.

(Col. No. 2416, U. S. M., Colorado River, Arizona. Collected by Stephen Powers.)

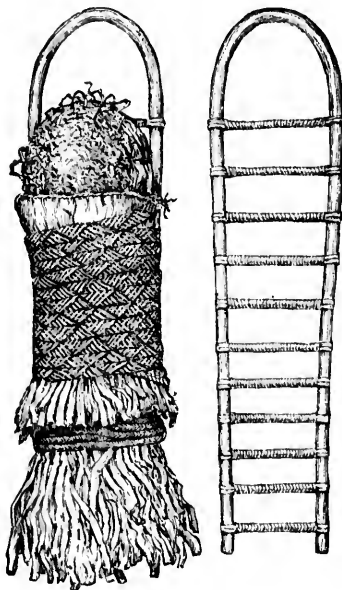


Fig. 15.

MOHAVE CRADLE, WITH BED OF SHREDDED BARK.

(Col. No. 2416, U. S. M., Colorado River, Arizona. Collected by Edward Palmer.)

in the shape of an ox-bow, the sides 7 inches apart at top and 5½ inches at bottom, so that the cradle is a little narrower at the foot. Eleven horizontal rods of wood, projecting at bottom, form the bed. The lashing of the cross-bars, like ladder-rungs, connect and strengthen the frame, crossing both in front and back, commencing at the bottom and ending near the bow. These rounds connect and partly cross-laced to consist each of three elements: a rod or spreader between the two sides; a separate transverse rod, the manner of administering the light but strong cross-bracing. Upon bending the large end of this ladder is laid the cradle bed of willow or mezquite bast, made as follows: Three bundles of stripped bast, each about an inch in diameter, are lashed at their middle with bast. They are then doubled together and spread out to form a bed. On this is laid a little series of transverse rods so a loose, finely-shredded bast like a nest, and the bed is ready for the baby. A dainty quilt or counterpane of bast is made from strips 30 inches long, doubled and braided at the top like a cinchure. This braiding is



unique, and so very neatly done as to demand explanation. Two strips made of bast are seized about their middle by a single twist of the two ends, forming a knot. The two ends are then woven into the fabric by a series of movements of twined weaving. Of course two halves will project above and two below the twist. Lay two more strips of bast in the second half of the width of the twist and draw down the first two upper ends, one to the right and one to the left, and the other between the second pair of strips, seizing them in place by another half turn of the twines. Lay on a thin pair of bast strips, one above and one below, and bring down the second pair of ends projecting upward, as at first. The weaving consists of four movements, namely: Laying in a pair of bast strips, grasping them with a half turn of the two twining wefts. Then bending down the two upward strips just preceding one between them and the other outside of the last two strips; and grasping them with a half turn of the twine. The lashing belts of this cradle are twelve to fifteen inches wide, made of braids, made of red, green, white, and black woolen and cotton cords, braided after the manner of the peculiar type of ornamentation designedly originated by braiding with threads of different colors. In this belt of several colors the threads are so arranged as to produce a series of continuous series of similar triangles, filling the space between two parallel lines by having their bases above and below alternately. Now the gist of the ornamentation is the parallelism of the braiding threads, now to one side of the triangle, and in the next figure running in the opposite direction exactly at right angles. One of the commonest ornaments on the pottery, rude stone, and carved wood is this distribution of lines into triangles.

Of the Pimos, neighbors of the Mohaves, Dr. Palmer says, that on long journeys they use the cradle-board; but as soon as a child is able to stand alone the Pimo mother allows it to mount upon the immensurable cinchura of bark worn on her back and to grasp her around the neck.

The floor of the Yaqui cradle is of the slatted type, 30 inches long. A dozen or more reeds, such as arrow-shafts are made of, are fastened in the same plane by a dowel-pin. The reeds are not bored for the pins, but simply notched in a primitive fashion. (Fig. 16.)

There is no cradle-trough, but a bed of willow or other bast, shredded and laid on longitudinally. The pillow consists of a bundle of little splints laid on transversely, at either end of which is a pad of rags. There is no awning; the lashing in this instance is a long cotton rag, taking the place of a leather strap, passing round and round baby and frame, and fastened off in a martingale arrangement, crossing the feet and the ropes to the lower corners of the cradle. Upon this cradle-rack or frame is fastened the true cradle, which, in this instance, is a strip of coarse mat-

Bourke, Capt. J. G.: Speaking of the Umené of the Rio Helax, in 1824, who have been the Yumas of the Rio Gila, Pattie says: "They contrive to inflict upon their children an artificial deformity. They flatten their heads by pressing a board upon their tender scalps, which they bind fast by a ligature. This board is so hard and tight that I have seen women when swimming in the river with their children towing them after them with a string which they held in their mouth. The little things neither suffered nor complained, but floated behind their mothers like ducks." (Pattie's Narrative, Cincinnati, Ohio, 1833, p. 92.)

and explanation. Two strips made of soft flags, a foot wide, joined by cross-rows of twined weaving  
single twist of the two  
inches apart. This mat is bordered by a braid of flags, and the two  
halves will project above  
ends are puckered or drawn to a point. The cradle belongs to the open,  
s of bast in the second high  
hooded type, and is made by doubling the matting at the head and  
upper ends, one to the right  
drawing it together to a point at the foot. The two edges next to the  
strips, seizing them in place  
cradle-frame are joined and fastened to the  
on a thin pair of bast strip  
same, while the outer edge is allowed to flare  
projecting upward, as at first  
open. In this little ark of flags or rushes the  
namely: Laying in a pair  
baby is placed.\*

ru of the two twining welfs The children of the California peninsula  
preceding one between th  
and walk before they are a year old.  
rasping them with a half tw  
When they are born they are cradled in the  
iddle are twelve to fifteen ph  
ell of a turtle or on the ground. As soon  
ck woolen and cotton cord  
s the child is a few months old, the mother  
type of ornamentation unl  
laces it perfectly naked astraddle on her  
eads of different colors. O  
houlders, its legs hanging down on both  
so arranged as to produce  
ides in front. In this guise the mother roves  
g the space between two p  
about all day, exposing her helpless charge  
nd below alternately. Now the hot rays of the sun and the chilly winds  
elism of the braiding threads  
at sweep over the inhospitable country.†

the next figure running in a di  
Like her white sister, the Indian mother (to  
the commonest ornaments one) in Mont  
a and her friends make prepar  
s this distribution of lines  
intions for the coming event by collecting  
oths, and the board that the child is to pass  
Dr. Palmer says, that on long  
many hours of its first year of life on,  
as soon as a child is able  
rich, if richly ornamented with beads, otter-  
o mount upon the immens  
skin, and fringes, with bells on them, is worth  
grasp her around the neck  
good horse, which is generally what is given  
atteded type, 30 inches long  
the child's board or cradle. This is usually  
fts are made of, are fastene  
case when the boy or girl is given and  
eds are not bored for the pins  
lopted by another mother. So an Indian

(Fig. 16.) child has generally two mothers, and of course two fathers, but the  
willow or other bast, shredded  
ether has but little to do with the child till it is old enough to run  
sts of a bundle of little splint  
ground.

h is a pad of rags. There  
When the child is born it is taken in charge by its adopted mother,  
is a long cotton rag, takin  
by a hired woman. It is washed, dried, then greased, and powdered  
t and round baby and fram  
ith red ocher, then nursed by some Indian woman or its mother, and  
ent, crossing the feet and tie  
rapped up, with its arms down by its side, in a buffalo-calf skin or  
this cradle-rack or frame  
awl or small blanket, and placed in its board or cradle, to be taken  
tance, is a strip of coarse mat

\* Acosta, Padre José de. (The Natural and Moral History of the Indies. Ed. Hak-  
of the Rio Helay, in 1824, who man-  
ye Soc. London. 1840. 8vo.) Of the "Chichimecas"—savage mountaineers—he  
ys: "They contrive to inflict up-  
ya: "The wives likewise went a hunting with their husbands, leaving their young  
children in a little panier of reeds, tied to the boughs of a tree." (Vol. II, p. 150.)  
a ligature. This board is so larg  
ead-flattening. (Mexico.) "Las parteras hacen que las criaturas no tengan colo-  
g in the river with their children  
illos; y las madres las tienen echadas en cunas de tal suerte que no les crezca,  
held in their month. The litt  
oque se precian sin el." (Gómara, Mejico, p. 140.)

† Cradle of Turtle-shell, Low. Cal. Inds., 1773. Baegert, in Smithsonian Rep., 1863,  
362.

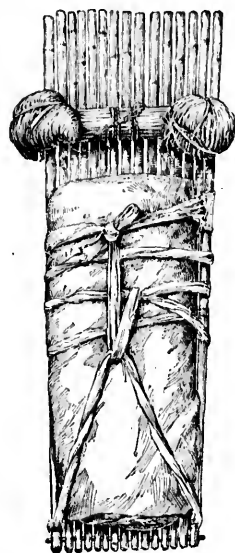


Fig. 16.  
YAQUI CRADLE, MADE OF CANES.  
SOFT BOWS USED FOR PILLOWS.  
(U. S. N. M. Sonora, Mexico. Collected by  
Edward Palmer.)

around to its relations' lodges for inspection. Every evening it is taken from its confinement to be washed, painted, and dressed again, and greased. The first cloth over its posterior is laid with a coating of pulverized buffalo dung or chips, and this is used as a white woman uses a diaper.

As it grows older it is taken by its mother, placed up in the lodge outside, while she goes about her work. If the child is restless it is nursed while on the board. After six to eight months of age the child is laid to sleep without the board, and it is generally discarded after a year old, though I have seen Indian boys and girls suckling at five or six years of age. An Indian child, like a white one, is pleased with toys, candy, etc., and their instincts are alike. They cry, laugh, are amused, frightened, and astonished, and as they are born and brought up so do they live.

The board upon which a child is laid is covered with a tanned elk skin or deer-skin, and beads worked on it. The place where the child reposes is loose, and is laced and tied up when the child is placed in it.

The straps for carrying and suspending it are on the opposite side of the board, and in carrying, the strap is brought over the head and placed across the upper part of the breast and across the shoulders. This brings the board upon which the back of the child rests against the back of the mother. The board is one-quarter of an inch thick, from 2½ to 3 feet in length, and 1½ feet in bulge of board.

The Nez Percé Indians belong to the Sahaptian stock, and were once a noble people, dwelling on the Snake River and its affluents in Idaho. They have produced the historical character, Chief Joseph, but are now reduced to an enervated remnant dwelling on the Nez Percé Reservation. The basis of the cradle is a rough board, generally hollow, 3 feet high, 15 inches wide at the top, and not more than an inch thick. It is shaped somewhat like a tailor's sleeveboard, but is not tapering (Fig. 17). This board is covered with buckskin, drawn perfectly tight upon the back and across the broad part of the front as if down as the hood, or about one-third the length. Below that the edges of the buckskin form flaps, which meet nearly over the child. Along the edges of these flaps strings are looped, into which loops lashing cord passes backward and forward to inclose the child tight in its capsule. On the top of the back a fringe of buckskin strings formed, either by slitting the buckskin covering itself or by a separate strip sewed on at this point. A little above the center is sewed the head strap of buckskin, to enable the mother to transport her child or to suspend it when at rest. The hood of the cradle is based upon the flaps of buckskin, but these are entirely concealed by the covering of flannel or other substance. The most ornamented portion of the cradle is the

\* Catlin, George. (Illustrations of the Manners, etc., of the N. American Indians. London. 1876. 8vo. Vol. 1.) Head of Crow chief distorted into semi-lunar shape (p. 50).

on. Every evening it is taken part above the hood; a piece of flannel or buckskin is covered with  
 nted, and dressed again, a head-work, solid, or has figures wrought upon it in various patterns.  
 or is laid with a coating of d To the hood are attached medicine-bags, bits of shell, haliotis perhaps,  
 his is used as a white woman and the whole artistic genius of the mother is in play to adorn her  
 offspring. After the child is lashed in the cradle, a triangular flap of  
 ther, placed up in the lodge buckskin, also adorned with head-work, is tied over the child to the  
 If the child is restless it buckskin flaps on either side.

eight months of age the child The Spokanes belong to the Salishan stock. They are described by  
 is generally discarded after Lewis and Clarke, by Governor Stevens (Rep. Ind. Art., 1854), and by  
 and girls suckling at five at Wimans. Living on the eastern border of the Salish area in Idaho and  
 a white one, is pleased with Washington Territory, their cradles are almost identical with those of  
 alike. They cry, laugh, at the Nez Percés, just described.\* Neither of the specimens contains  
 as they are born and brought a bed or a pillow, so that we are at a loss as to the effect of the cradle  
 in occipital flattening. But we can be positive as to one thing, that  
 is covered with a tanned skin neither of these examples is there the least provision for intention-  
 t. The place where the child is deformed the forehead. The Salish are frequently called Flatheads,  
 when the child is placed in it but from the example of cradle furnished it seems that they are the

g it are on the opposite side  
 ought over the head and placed  
 d across the shoulders. The  
 of the child rests against the  
 quarter of an inch thick, from  
 ge of board.

the Sahaptian stock, and we  
 ke River and its affluents  
 al character, Chief Joseph, be  
 ant dwelling on the Nez Per  
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 e broad part of the front as  
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 h meet nearly over the chil  
 are looped, into which loops  
 ard to inclose the child tight  
 a fringe of buckskin strings  
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 ve the center is sewed the  
 to transport her child or to s  
 adle is based upon the flap  
 ed by the covering of flannel

only coast stock about the Columbia that does not practice intentional  
 flattening. The Museum specimen from the Spokanes is an excellent  
 example of aboriginal work. (Fig. 18.) Everything about it is complete.

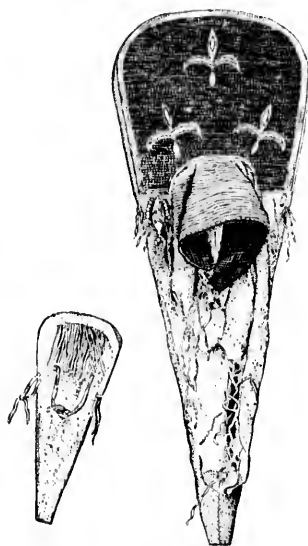


Fig. 17.

Fig. 18.

NEZ PERCÉ CRADLE-BOARD WITH BUCKSKIN SIDES.

SAHAPTIAN CRADLE-BOARD.

(Cat. No. 23405, U. S. N. M., Nez Percé Agency, Idaho. Collected by J. B. Moore.) (Cat. No. 129675, U. S. N. M., Spokane Indians, Washington. Collected by Mrs. A. C. M. Bean.)

\* See Fig. 17.

On the back is a long ornamental fringe at top, and lower down below the head-strap and two extra straps at the margin to secure the cradle in other manipulations. The upper portion of the front is covered with head-work, solid blue ground, with bird-shaped figures in amber and pink beads. On the right side of the hood hangs a long medicine bag of buckskin, adorned with light-blue beads of large size. A newspaper correspondent from this region mentions a buckskin string upon these cradles in which a knot is tied for every moon of the child's life. There are little buckskin strings in the margin of this cradle near the hood but no knots have been tied in either of the cradles here described.

In these two, as in many others mentioned in this paper, there is a charming combination of the old and the new. The slab, the buckskin, the medicine-bag, the fringe, the lashing are all pre-Columbian. The beads, the flannel, the cloth lining, etc., are evidently derived materially from the whites. There is no change of structure or function effected by any of these things. They simply replace other materials such as quill-work, shell-work, native cloth, fur or buckskin, in use before the advent of the whites.

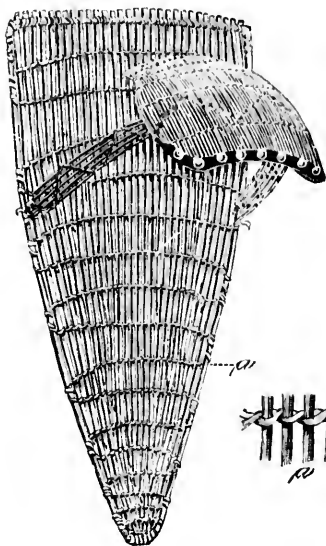


Fig. 19.

NEVADA UTE CRADLE-FRAME OF RODS, WITH ADJUSTABLE AWNING.

(Cat. No. 76734, U. S. N. M. Specimen obtained from the Nevada exhibit at the New Orleans Exposition.)



Fig. 20.

NEVADA UTE CRADLE; FULL RIGGED.

(Cat. No. 10040, U. S. N. M. Pyramid Lake, Nevada. Collected by Stephen Powers.)

One of the widest-spread stocks of Indians formerly were the Shoshonians, reaching down the Great Interior Basin throughout its whole

at top, and lower down both margin to secure the cradle. The front of the front is covered with shaped figures in amber and hangs a long medicine bag of large size. A newspaper buckskin string upon the hood of the child's life. The cradle near the hood of cradles here described. The cradle in this paper, there is a new. The slab, the buckskin are all pre-Columbian. The cradles are evidently derived from the same of structure or function to simply replace other materials, such as, fur or buckskin, in use by

extent, crossing the Rockies on the east under the name of Comanches, and in southern California extending quite to the Pacific Ocean. Spread over such a vast territory, the Shoshonian cradle was modified here and there by the nature of things, by the contact of dominant tribes, and by changed habits of life.

The Utes of Pyramid Lake, Nevada, make use of a flat wicker cradle-frame, kite-shaped or roughly triangular. The widening is effected by the intercalation of rods as they are wanted. At the top the rods are held in place by a cross-rod lashed to the ends of the parallel pieces. The twined weaving is characteristic of the Utes in all of their textiles. A pretty addition to the Ute cradle is the delicate awning of light wicker attached by its lower narrow border to the bed-frame and held at the proper angle by means of braces made of the same material (Figs. 19, 20).

Three specimens from this area are in the Museum, showing them as frame and as finished cradles. Indeed, we have only to cover the lattice with buckskin after the manner of those used by the Spokanes and the affair is complete.

In the eastern portion of Utah once dwelt various tribes of Ute Indians. In the National collection is a cradle from this region marked Uncompaghre Utes (Fig. 21). It is an old affair, showing scarcely a



Fig. 20.

NEVADA UTE CRADLE: FULL RIGGED.  
Cat. No. 12302, U. S. N. M., Pyramid Lake, Nevada.  
(Collected by Stephen Powers.)

Indians formerly were the Shoshonians of the Basin throughout its whole

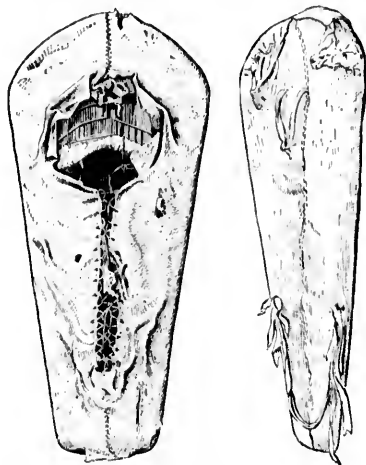


Fig. 21.

UNCOMPAGHRE UTE CRADLE: SHOWING FRONT AND BACK.

(Cat. No. 12302, U. S. N. M., Uncompaghre River, Colorado (?). Collected by Captain Beckwith, U. S. A.)

sign of white contact, excepting a bunch of blue rag over the hood. The cradle is built upon a thin board 1 foot high, 18 inches wide at top, and tapering to half that width at bottom. The covering is of buckskin, seamed on the back, and very clumsily put on. There are two

suspension straps, one near the top and the other very low down. In the front the buckskin has loose flaps to inclose the child. The hood or awning is a very curious affair, and if closely drawn down would certainly give to the Uncompaghe child the forehead of a Flathead. This is a kind of tiara, made of little twigs lashed to stronger rods. The lower margin over the child's forehead is bound with soft buckskin. The hard cradle-board allies it to the Northern type, where timber is larger, rather than to the pure Ute type, where a hurdle takes the place of the board.

The cradle-frame of the Southern Utes is so well shown in the drawings presented as not to need very minute description (Figs. 23, 24). The frame-work consists of three parts, the slats, the

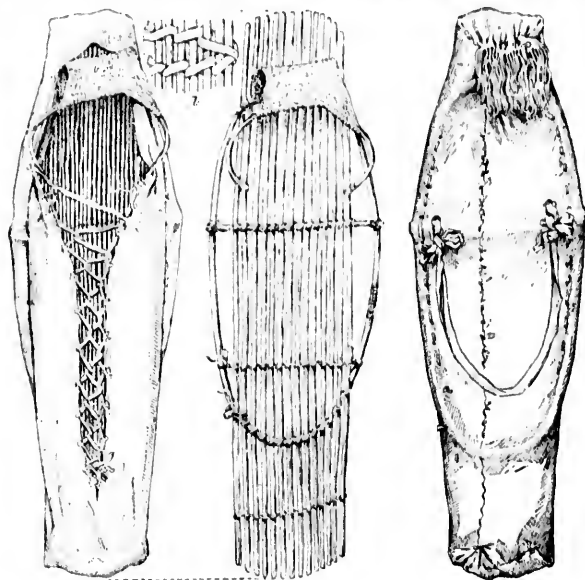


Fig. 23.

Fig. 24.

Fig. 25.

THREE VIEWS OF UTE CRADLE-FRAME, MADE OF RODS AND COVERED WITH DRESSED BUCKSKIN.

(Cat. No. 1466, U. S. N. M., Southern Utah. Collected by Major J. W. Powell.)

and the hood. A dozen twigs like arrow-shafts, 4 feet long, are in place by here and there a twine of basketry; across the portion which the ends of the head-band are to be attached a rod is lashed to hold the lattice firmly in place. A hoop of twig, elliptical in form, is lashed to the frame wherever it touches and to the ends of the cross-rod. To the upper border of the hoop is sewed an irregular quadrangular piece of twined basketry weaving. Its outer border is sewed to a band which is bent and fastened at its ends to the slats. This forms

the other very low down, to enclose the child. The hood is closely drawn down would be the forehead of a Flathead, lashed to stronger rods. This is bound with soft buckskin of northern type, where timber is so well shown in the minute description (Figs. 23, 24, 25, 26). The parts, the bow-

awning of the cradle. We are now ready for the cover, which is formed by a wide piece of the whitest buckskin, wrapped on as in making a bundle, sewed on the back and slit open in front. The upper portion is cut into the neatest possible fringe. A broad head-band of soft buckskin completes the outfit. A specimen from the same locality varies somewhat in detail.

This cradle has the ox-bow frame lathed along the back with twigs close together and held in place by a continuous seizing of sinew. Although a rude affair, this fact is evidently due to the lack of material in a desert country rather than to want of taste in the maker. The awning for the face is a band of wicker, 4 inches wide, attached by its ends to the side frame of the cradle. This band is of twined weaving, the weft running houstrophedon. Notice especially that each half turn of the twine takes in two warp twigs, and that when the weaver turned backward she did not inclose the same pairs of warp twigs, but twined them in quincuncially, creating a mass of elongated rhomboidal openings, exactly as the Aleutian Islanders weave their marvelously fine grass wallets, while the Ute weaving is a model of coarseness in an identical technique.

The head-band of buckskin is not tied immediately to the bowed frame, but is knotted to a loop made of a narrow string, wound three times around the frame and knotted.\*

The elements of the Moki cradle-frame are the floor and the awning. As a foundation a stout stick is bent in shape of the ox-yoke bow. Rods of the size of a lead-pencil are attached to the curve of this bow and stretched parallel to the limbs of the bow. Twigs are closely woven on this warp by regular basketry weaving. The Moki are the only savages west of the Rocky Mountains who practice this real wicker weaving. The awning, as the drawing shows, is a band of the same kind of weaving on a warp of twigs in bunches of twos or threes, these last attached to blocks of wood at the ends of the fabric. The awning is bowed upward and the end blocks lashed to the upper portions of the limbs of the bow. A small aperture in the floor is for convenience in cleansing. The next figure shows how by using parti-colored and finer twigs, and by a different administration of the middle warp strands and the awning, pretty varieties of the same style of cradle may be effected (Figs. 25, 26).

The Zuñi cradle-board is worthy of our closest study (Fig. 27). It is founded on a rough piece of board, hewn out to an inch in thickness, 3 feet long, and about a foot wide. A pillow-rest of wood is fastened to it as to steady the head. This is pegged or nailed down to the board,

\* Powell, Maj. J.W., "Exploration of the Colorado River," Washington, 1875, 4to). In "Grand Cañon the Indians" make a wicker board by plaiting willows, " \* \* \* sew buckskin cloth to either edge, \* \* \* filled in the middle, \* \* \* to form a sack," and place the child, wrapped in fur, within this. There is a wicker shade at the head, and the cradle is slung on the mother's back by a strap passing over the forehead (p. 127).

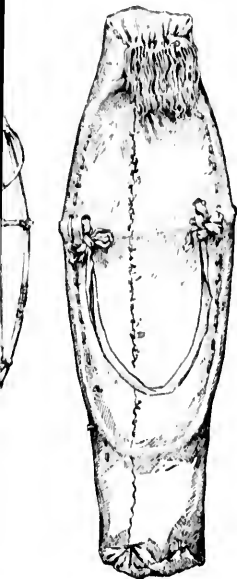


Fig. 23.

OF RODS AND COVERED WITH BUCKSKIN (Illustrated by Major J. W. Powell.)

bow-shafts, 4 feet long, are lashed to the ends of the cross-rod by a different administration of the middle warp strands and the awning, pretty varieties of the same style of cradle may be effected (Figs. 25, 26).



There is no buckskin covering, but a set of loops along the edges to accomplish the lashing. The most curious part of the apparatus is a series of four bows or half hoops of equal radius. These are woven on the side of the board, as indicated in the drawing. A string is tied to the top of the board and to each of the hoops at a certain distance, so that when the loose end of the string is pulled the hoops form a "hood."

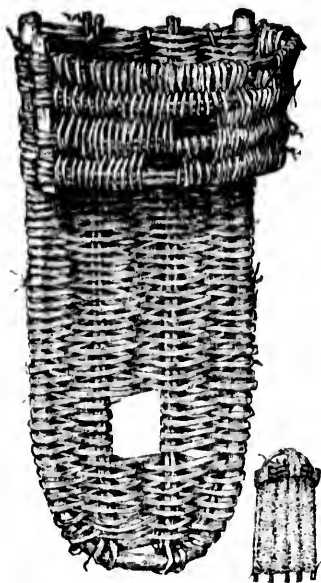


Fig. 25.

MOKI CRADLE-FRAME, OF COARSE WICKER, WITH AWNING.

(Cat. No. 2354. Moki, Pinalia, Arizona. Collected by Maj. J. W. Powell.)



Fig. 26.

MOKI CRADLE-FRAME, OF FINE WICKER, RESEMBLING THE SACRED MESCAL-TRAY IN DESIGN.

(Cat. No. 41799. U. S. N. M., Moki, Pinalia, Arizona. Collected by Maj. J. W. Powell.)

top," or adjustable hood to the cradle. In no other cradle is the part so fastened more delicate. It depends almost entirely upon the bed to neutralize the effects of this cradle. Without examining the heads of Zuñi Indians at all we ought to find the occiput pushed in, flattened, and asymmetrical. Should they prove otherwise, it is right to assume a bed capable of counteracting this influence.

The Apache Indians of Arizona and New Mexico\* make a waddle, an elaborate cradle, the substantial part consisting of the frame and the hood. (Fig. 28, *a b*) The frame is elliptical in form, the outline being formed by a pole of wood bent and the two ends spliced and lashed together. Upon this ellipse are laid laths of white pine, planed. Over the hood the

\* Bancroft. (Native Races of the Pacific States. New York, 1873. Vol. I.) And the Apaches of the Lower Colorado the great "is widely separated from the one which arises probably from wading in marshy bottoms" (p. 479).

of loops along the edges...  
ions part of the apparatus...  
radius. These are woven...  
drawing. A string is tied...  
oops at a certain distance...  
alled the hoops form a "cup"

face is built the hood formed by bending two bows of supple wood to the required shape and overlaying them with transverse laths of pine wood close together and tied down. The upper edges of these laths are beveled, so as to give a pretty effect to the curved surface. The outer-work on the cradle consists of a gable of white buckskin to the hood, a binding of brown buckskin on to the bowed frame above the hood, variegated with narrow bands of white buckskin, and, finally, the true sides or capsule of the cradle, consisting of a strip of soft brown buckskin, say 10 inches wide, cut in fringe along its lower border and edged with fringe of white buckskin long its upper outer edge. This strip is fastened to the cradle continuously, commencing at an upper margin of the awning, carried along his awning, fastened to its lower margin 4 inches above the junction of the awning and frame, passes on to the foot and around to the other side, as at first. Slits are made in the upper edge of the brown buckskin just below where the white buckskin fringe is sewed or run on, and back and forward through these slits a broad soft band of buckskin passes to form the cradle lining. To perfect the ornamentation of this beautiful object, tassels of buckskin in two colors, and strings of red, white, and blue beads are disposed with great care. Thanks to the generosity of friends living at the frontier, it is possible to reproduce from photographs the method of fastening the child in the cradle. (Fig. 29.) A bed of fur lies between the back of the infant and the floor of the cradle. The head is perfectly free and free during waking moments. Indeed, there is always freedom in, flattened, and asymmetrical to the child's head in all cradles except on the Pacific coast around the Columbia River and Puget Sound. Another drawing (Fig. 30) exhibits the method of nursing the babe without removing it from the cradle. Finally, Fig. 31 shows an infant and a small child that have been subjected to the cradle-board.

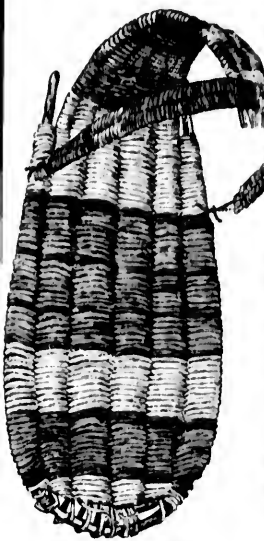


Fig. 26.

MOKI CRADLE-FRAME OF FINE WICKI  
RESEMBLING THE SACRED BEAL-TRAY  
IN FORM.  
(Cat. No. 11756, U. S. N. M., Moki, Pueblo,  
Collected by Mr. J. W. Powell.)

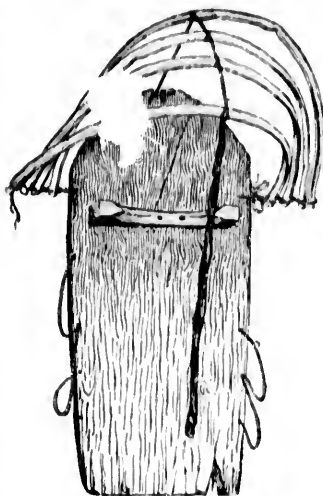


Fig. 27.

ZUNI CRADLE-FRAME.

(Cat. No. 8905, U. S. N. M., Zuni Pueblo, New Mexico,  
Collected by Col. James Stevenson.)

In no other cradle is the infant  
entirely upon the bed to nurse  
the heads of Zuni Indians  
ed in, flattened, and asymmetrical  
s right to assume a bed able  
d New Mexico\* make a vadle. Finally, Fig. 31 shows an infant and a  
consisting of the frame and  
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the back of the infant and the floor of the cradle. The head is perfectly free and free during waking moments. Indeed, there is always freedom in, flattened, and asymmetrical to the child's head in all cradles except on the Pacific coast around the Columbia River and Puget Sound. Another drawing (Fig. 30) exhibits the method of nursing the babe without removing it from the cradle. Finally, Fig. 31 shows an infant and a small child that have been subjected to the cradle-board. The cradle-frame of the Navajos is made of two pieces of wood lashed together so as to make the upper end or head in shape like a boot-jack. The sides of these boards long loops of buckskin are attached to aid the lashing (Fig. 32). A new feature in western cradles appears in

the specimen figured. It is the foot-board, so common in all the of it, gonkin and Iroquois specimens. The pillow is to be noticed especial last d consisting of soft furs and rags rolled up in soft buckskin and faster form to the board. The awning frame is a wide bow of thin, hard wo measu over which falls a wide, long veil or flap of buckskin. This cradle of the collected by Dr. R. W. Slaughter, U. S. Army, who kindly made so. In c investigations relative to the use and effect of the Navajo cradle. differ occasi I coul back o it was And this is alway up in sustai pressu back o We of playin when Amou self--a ted h heads girl, v Anato The is corr thoug to ma differ the pr order I hav have tinnu that a but I skulls No way, head Per was v and a

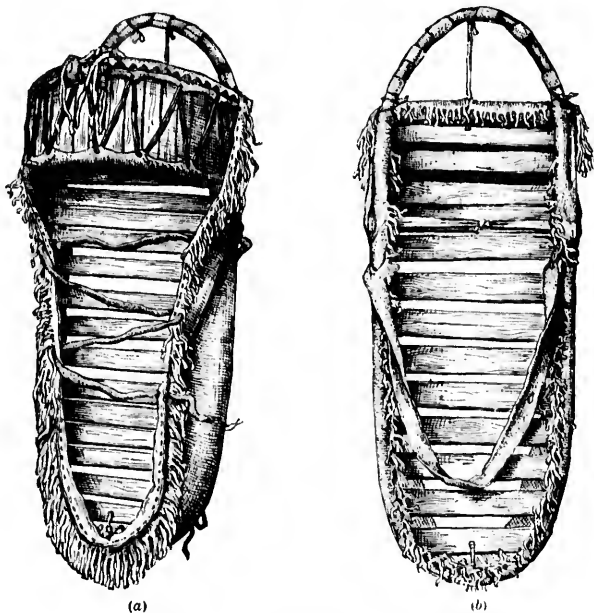


Fig. 28.

APACHE CRADLE. FRONT AND BACK VIEW.

(Cat. No. 21523, U. S. N. M. Arizona Territory. Collected by Dr. F. B. White, U. S. A.)

Of some two or three dozen children of all ages from the infant wards that I have examined I have yet to find a case wherein the Navajo mother has not taken the special precaution to place a soft and an pad in the cradle to protect the back of the child's head. Moreo I have yet to see a case, except for a few days or more in the y youngest of babies, where the head is strapped at all. On the o hand, this part of the body is allowed all possible freedom. I am l enabled to present a picture, which shows exactly the method emple by these squaws in both carrying and strapping their babies in cradle (Fig. 33.)

It will at once be observed that the head of the child is perfectly and that it has been supplied with a thick and soft pillow at the

and, so common in all the of it, whereas the body and limbs have been strapped up almost to the low is to be noticed especial last degree. This child has light, thin hair, through which the general in soft buckskin and fastener form of the skull could be easily examined, but after the most careful wide bow of thin, hard wood measurements I failed to detect any flattening of the occipital region of buckskin. This cradle of the head.

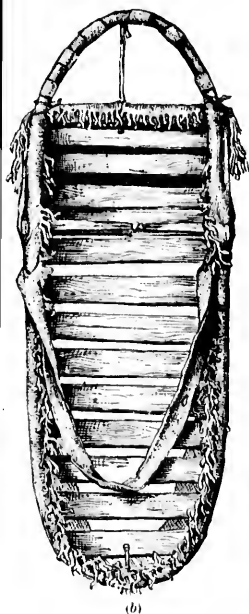
Army, who kindly made so In examining the full blooded infants of different ages of this tribe of Indians I occasionally found one wherein I thought I could satisfactorily determine that the back of its head was unduly flattened, but it was by no means always the case.

Another thing must be remembered, and this is that these Navajo women do not always keep their infants thus strapped up in their cradles, and this fact goes to sustain the proposition that whatever pressure is brought to bear against the back of their heads, it is not a constant one. We often see here the little Navajo babies playing about for hours together at a time when they are scarcely able to walk. Among older children I have satisfied myself—as well as I could through their matted hair—that the hinder region of their heads was flattened, but it never seemed to equal that of the Navajo girl, which I have illustrated in the October number of the *Journal of Anatomy*.

There can be, I think, no question but that Prof. Sir William Turner is correct in regard to its being not only a distortion but due to pressure, though it would appear from the examinations which I have been able to make that at some time or other the strapping must have been very differently applied. To produce posterior flattening of the skull alone the pressure must be applied only upon that side, and to do this, in order to produce anything like the extraordinarily distorted skull that I have figured in my second paper on this subject, the child would have to have its head against a hard board for a long time and continually kept there. If it were strapped it must be quite obvious that a certain amount of frontal flattening would also be produced, but I have never discovered such a distortion in any of the Navajo skulls.

Now, so far as I have seen, they do not treat their children in this way, but, as I have said, always give them a soft pillow and leave the head free.

Perhaps in former times the strapping of their babies in these cradles was very different from the methods now employed among this tribe, and again, the question of heredity may possibly enter into the subject,



FRONT AND BACK VIEW  
(Redrawn by Dr. J. B. White, U. S. A.)

of all ages from the infant to find a case wherein the Navajo women place a soft and an cushion under the child's head. Moreover, after a few days or more in the cradle they are strapped at all. On the other hand, they give them all possible freedom. I am convinced that this is exactly the method employed in strapping their babies in the cradle. The head of the child is perfectly free, and a thick and soft pillow at the



FIG. 29.  
ATACHE WOMAN CARRYING CHILD.  
(From photograph.)

or more extended observations may prove that this flattening of the skull only occurs in a certain proportion of the representatives of the race, and not in every individual.



Fig. 30.

APACHE MOTHER NURSING CHILD.

From photograph.

Dr. R. W. Shufeldt, U. S. Army, sent to Prof. Sir William Turner, Edinburgh, a Navajo skull, which is described in the *Journal of Anatomy and Physiology*, vol. XX, p. 430, as follows: The skull presented well-marked parieto-occipital flattening, obviously due to artificial pressure, which had been applied so as to cause the suprasquamous part of the occipital bone and the posterior three-fourths of the parietal to slope upwards and forwards. The frontal region did not exhibit any flattening, so that in this individual, and it may be in his tribe of Indians, the pressure applied in infancy was apparently limited to the back of the head. Owing to this artificial distortion the longitudinal diameter of the head was diminished, and the cephalic index 94.6, computed from Dr. Shufeldt's measurements of the length and breadth, was therefore higher than it would have been in an undeformed skull. The cranium was hyperbrachycephalic.

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The height of the skull was also very considerable and reached, as may be seen from the table, 115 millimeters; the vertical index was 89, so that the skull was hyperaerocephalic. In all probability the pressure during infancy, which shortened the skull in its antero-posterior direction, forced the vertex upwards and added to the height of the cranium, so that the high vertical index was occasioned both by diminished length and increased height. The skull was cryptozygous, for not only was the breadth in the parietal region great, but the stephanic diameter was 137 millimeters. The glabella was not very prominent, but the su-



Child.

to Prof. Sir William Turner. Described in the Journal of Anthropology, it follows: The skull presented a flattening obviously due to artificial pressure the suprasquamous part one-fourths of the parietal to the region did not exhibit any flattening. It may be in his tribe of Indians. The flattening is limited to the back of the skull on the longitudinal diameter. The vertical index 94.6, computed from the length and breadth, was therefore that of an undeformed skull. The cran-



Fig. 31.  
APACHE MOTHER WITH CHILDREN.

From photograph.

priciliary ridges were thick and strong. The bridge of the nose was concave forward, so that the tip projected to the front. The basi-nasal diameter was 105 millimeters; the basi alveolar 98 millimeters, the gnathic index was 93, and the skull was orthognathic. The nasal spine of the superior maxilla was moderate. Where the side walls of the anterior nares joined the floor the margin of the opening was rounded. The transverse diameter of the orbit was 40 millimeters, the vertical diameter 36, the orbital index was 90, and the orbit was megaseme. The

nasal was 48 millimeters, the nasal width 25, the nasal index was 54, and the nose was mesorhine. The palato-maxillary length was 55, the palato-maxillary width was 72 millimeters; the palato-maxillary index was 128, and the roof of the mouth was brachyuranic. The teeth were all erupted and not worn. The cranial sutures were all unossified.

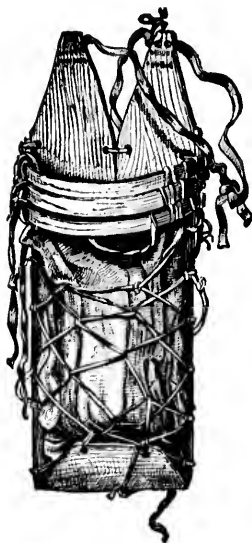


Fig. 32.  
NAVAJO CRADLE: FULL-RIGGED, OF  
THE POORER SORT.  
FROM ARIZONA.

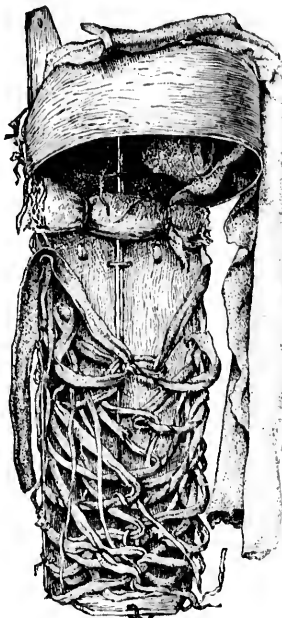


Fig. 33.  
NAVAJO CRADLE, WITH WOODEN HOOD,  
AWNING OF DRESSED BUCKSKIN.  
Cat. No. 12765, U. S. N. M., Fort Wingate, New Mexico.  
Collected by Dr. R. W. Shufeldt, U. S. A.

The parieto-sphenoid suture in the pterion was 19 millimeters in anterior diameter. There were no Wormian bones. The anterior end of the inferior turbinate bone was almost in the same plane as the anterior nares.

The Comanche cradle (6970) is the most primitive cradle in the National Museum (Fig. 34). It is a strip of black bear-skin 30 inches long and 20 wide, doubled together in form of a cradle-frame. Along the side edges loops of buckskin are made to receive the lacing. The loops are formed as follows: A buckskin string is passed through a hole in the bear-skin and the longer end passed through a slit or cut in the shorter end. The long end is then passed through the next hole and drawn until a loop of sufficient size is left; a slit is made in the skin near the last hole passed through, and then the whole lashing is drawn up, or





and the two ends tied, or one end is passed through a slit cut in the other. The lashing does not cross the square on either side diagonally. Above the upper cross-piece the frame pieces project a foot and a half, straightened atop like fence pickets. Disks of German silver shaped like brass-headed nails are used in profusion to form various geometrical ornaments; upon the front of the frame, between the cross-pieces, a strip of buffalo hide is sewn, with rawhide string passing through holes bored in with the hair side (the side pieces) towards the cradle-bed, to support the

The inclosing case is a shoe-shaped bag made of a single piece of soft deer-skin lashed together half way on top in the usual manner, and kept open around the face by a stiffening of buffalo leather or molly skin. A small opening is left opposite the penis, and a stiffening pole or cord keeps the bag open at the feet. This case is attached to the frame by leather thong lashings. Little sleigh bells, bits of leather, feathers, etc., complete the ornamentation (Fig. 36).



Fig. 36.

OGYALLA SIOUX CRADLE.  
Similar to Fig. 35, with  
addition of beading.

(Cat. No. 79472. Black Hill, Dakota.)



Fig. 36a.

OGYALLA SIOUX WOMAN.

(From photograph.)

The Sioux cradle is a frame of two diverging slats, painted yellow, held in place at the head and foot by cross-slats, lashed as in the manche cradle, with this difference, that the string crosses between the holes diagonally. This is true, but may have no significance. The ends of the side pieces project above the cradle sack at least 18 inches.

sed through a slit cut in are studded with brass-headed nails in straight lines (Figs. 36, 36 a). are on either side diagonals in the Comanche cradle there is a bottom or mattrass, and a quilt pieces project a foot and of calico, lined, supplants the buffalo hide. The baby-case is shoe-Disks of German silver shaped, the part around the head and shoulders stiffened with a lining on to form various geomet of buffalo leather. All over the outside of the baby-case bead-work is e, between the cross-pieceaid on in geometric patterns of blue, red, yellow, green, and blue-black to string passing through on a white ground. The beads are strung on a fine sinew-thread in es) towards the cradle-bed, proper number and color to extend quite across the case. This string bag made of a single piece then tacked down at intervals of three-fourths of an inch so regularly s on top in the usual manner to form continuous creased lines, extending from the foot longitudi-ning of buffalo leather or rally around the baby-case to the foot on the other side. Streamers of ie penis, and a stiffening colored tape and ribbon take the place of old-fashioned strings, fur, and se is attached to the frameathers. The edges of the lower half of the case are joined by four of leather, feathers, etc., strings tied separately, instead of the universal lashing. There are



Fig. 36r.

OGLALLA SIOUX WOMAN.

(From photograph.)

diverging slats, painted yellow cross-slats, lashed as in the t the string crosses between have no significance. The t dle sack at least 18 inches.

bout this cradle several marks of modification by contact with whites, hich show at the same time the tenacity with which old forms remain nd the readiness with which they yield to pressure at the points of ast resistance, indicating also where the points of least resistance are.

Another specimen of Sioux cradle has the back-board square at top, rved and painted, barrow-shaped, like last, awning-frame bent and ainted, covering-cloth decorated with beads. It is tacked around edge f side board, brought up and laced in the middle like a shoe. Model f doll with iron necklace. Length, 28 $\frac{3}{4}$  inches; width, 13 inches. ack-board carved on front above; back-brace has large rounded ends; ot-rest low, curved around at bottom; cradle covered over with quill-ork in red, white, and black; pattern, lozenges, men, horses, etc.; dec-erated with iron bells; opening across cradle cover in middle. (Fig. 37.)

Mr. Catlin thus describes the Sioux cradle, from a specimen in his ollection, and the early life of the Sioux infant: "The back-board is ide; wedge-shaped opening made by cutting piece out of top; top is ainted and decorated with beads; cradle has bent-wood sides, which ake it like a barrow: the head-pad is over the lower part of the wedge-Opening; ash awning-frame. The ends of this are fastened to a rod oing across the back, by a device, which may be called an ear-mortise. t is held down over rod by an iron dog fastened to side of cradle. adle, 29 $\frac{1}{2}$  inches long, 12 inches wide; length of side board, 2 $\frac{1}{2}$  inches; eight, 4 $\frac{1}{2}$  inches; height of awning-frame, 14 $\frac{1}{2}$  inches; width, 16 $\frac{1}{2}$  ches.

"The custom of carrying the child, among the Mississippi Sioux, is not eculiar to this tribe, but belongs alike to all, as far as I have yet visited em, and also as far as I have been able to learn from travelers who have een amongst tribes that I have not yet seen. The child, in its earliest ancy, has its back lashed to a straight board, being fastened to it by andages, which pass around it in front, and on the back of the board ey are tightened to the necessary degree by lacing-strings, which old it in a straight and healthy position, with its feet resting on a oad hoop, which passes around the foot of the cradle, and the child's

position (as it rides on its mother's back, supported by a broad strap that passes across her forehead), that of standing erect, which, without doubt, has a tendency to produce straight limbs, sound lungs, and long life.



Fig. 37.

## SIOUX CRADLE.

(Cat. No. 7311). U. S. N. M. Museum, Report. Collected by George Catlin.

brightest colors to amuse both the eyes and the ears of the child. When traveling on horseback the arms of the child are fastened under the bandages, so as not to be endangered if the cradle falls, and when at home they are generally taken out, allowing the infant to reach and amuse itself with the little toys and trinkets that are placed before it within its reach.

The infant is carried in this manner until it is five, six, or seven months old, after which it is carried on the back in the manner represented in two of the figures of the same plate, and held within the folds of the robe or blanket.

The modes of carrying the infant when riding are also here shown, and the manner in which the women ride, which, amongst all the tribes is astride, in the same manner as that practiced by the men.

Letter *b*, in the same plate, is a mourning cradle, and opens to the view of the reader another very curious and interesting custom. When the infant dies during the time that is allotted to it to be carried in this cradle, it is buried, and the disconsolate mother fills the cradle

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"In this instance, as is of the case, the bandages that surround the cradle, holding the child in, are all the way covered with a beautiful embroidery of porcupine quills, with ingenious figures of horses, men, etc. A broad hoop of elastic wood passes around in front of the child's feet to protect it in case of a fall, the front of which is suspended a little toy of exquisite workmanship for the child to handle and amuse itself with. To this and other trinkets hanging in front of it there are attached many little tinseled and tinkling things of

s, supported by a broad strip of standing erect, which, I think, has a tendency to produce eight limbs, sound lungs, and long life.

"In plate 232, letter d, is a drawing of a Sioux cradle which is in my collection. It was purchased from a Sioux woman's back, as she was carrying an infant in it, as is seen in the figure of the same plate.

"In this instance, as is the case, the bandages that surround the cradle, holding the child in, are all the way covered with a beautiful embroidery of porcupine quills, with ingenious figures of horses, men, etc. A broad hoop of elastic wood passes round in front of the child's feet to protect it in case of a fall. The front of which is suspended the toy of exquisite embroidery for the child to handle and amuse himself with. To this and other trinkets hanging in front there are attached many beaded and tinkling things of wood and the ears of the child. When the child are fastened under the cradle falls, and when the infant to reach and amuse that are placed before it.

er until it is five, six, or seven years of age, when it is placed on the back in the manner represented in the drawing of the cradle-plate, and held within the arms of the mother.

When riding are also here shown, which, amongst all the tribes, is practiced by the men.

Turning cradle, and opens to the child's feet, and is of the same shape and interesting customs as the cradle-plate. It is allotted to it to be carried by the mother, and the solitary mother fills the cradle

with black quills and feathers in the parts which the child's body had occupied, and in this way carries it around with her wherever she goes, for a year or more, with as much care as if her infant were alive and in her arms, and she often lays or stands it leaning against the side of the wigwam, where she is all day engaged in her needlework, and chatting and talking to it as familiarly and affectionately as if it were her loved infant, instead of its shell, that she was talking to. So lasting and strong is the affection of these women for the lost child that it matters not how heavy or cruel their load or how rugged the route they have to pass over, they will faithfully carry this, and carefully, from day to day, and even more strictly perform their duties to it than if the child were alive and in it.

"In the little toy that I have mentioned, and which is suspended before the child's face, is carefully and superstitiously preserved the umbilicus, which is always secured at the time of its birth, and, being rolled up into a little wad of the size of a pea and dried, it is inclosed in the center of this little bag and placed before the child's face, as its protector and its security for "good luck" and long life.

"Letter e, same plate, exhibits a number of forms and different tastes of these little toys, which I have purchased from the women, which they were very willing to sell for a trifling present; but in every instance they cut them open and removed from within a bunch of cotton or moss, the little sacred medicine, which to part with would be to endanger the health of the child, a thing that no consideration would have induced them in any instance to have done."\* (Pages 130-132, vol. 11, Catlin's Eight Years).

\* Long, Maj. S. H. (Expedition to the Sources of the St. Peter's River. Philadelphia, 1824. 8vo.) Among the Pottawatomie great care is taken that the body shall be straight and well formed; no attempt is made to change the shape of the head, "this being regarded as having a tribal significance" (vol. 1, p. 100). On the Ottonwood River, Long saw an old Pottawatomie chief with "a child-board on his back, in which he carried his little grandson" (vol. 1, p. 178). The child was naked (p. 179). Of the Dacotah, Long or Keating, who compiled and edited his notes, says: "The practice of shaping the heads of infants is unknown to them" (vol. 1, p. 14).

Charlevoix, Pêre de. (Journal of a Voyage to North America. London, 1761. 8vo.) He Têtes de Boule (Roundheads), an Algonquin tribe north of Montreal, "have their name from the roundness of their heads; they think there is a great beauty in this figure, and it is very probable the mothers give it to their children while in the cradle" (vol. 1, Letter XI, p. 285). Speaking of the fine figures of the "Indians of Canada," Charlevoix says that one reason for this is, that "their bodies are not constrained in the cradle" (vol. II, Letter XXI, p. 79). Just after (p. 120) he describes the ornamentation of "their children's cradles" among the Hurons.

Lahontan, Baron. (New Voyages to North America. London, 1735, 2d ed. 8vo.) These observations were made upon the Algonkian and Iroquoian tribes of the St. Lawrence and the Lakes in the latter part of the seventeenth century. Like Hearne, he says: "There is no such thing as a cradle among the savages" (vol. II, p. 7); but he adds that "the mothers make use of certain little boards, stuffed with cotton, upon

East of the Mississippi River, north of the Tennessee and the North Carolina line, and south of Hudson Bay lived Algonkin and Iroquois stocks, and all of them used a flat cradle-board, not far from 2½ feet long, 10 inches wide, and one-half inch thick, tapering wider at the head. The St. Regis Iroquois, in the north of New York and near the

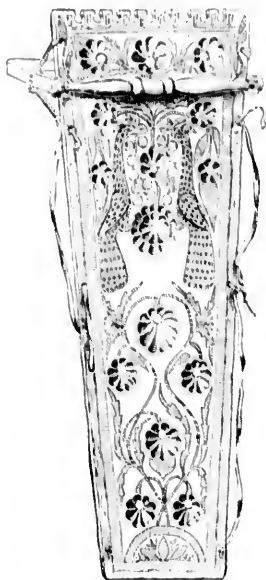


FIG. 38.

IROQUOIS CRADLE. BACK VIEW.

Coll. No. 12066, U. S. N. M., St. Louis, New York.  
Coll. 1872, J. B. Hodge.

for lashing baby in. Length, 29½ inches; width, top, 10½ inches; bottom, 8½ inches. Foot-rest, height, 3½ inches; width, 6 inches. (Fig. 38.)

The following notes regarding the Indians east of the Mississippi River have been collected in the course of the author's reading, and are here appended to throw additional light upon the subject:

Heriot, G. (*Travels through the Canadas*. London, 1807. 4to.) "The use of a pillow is known to but a few" among the Iroquois tribes. Having seen that article in use, they imitate it "with a billet of wood, with a mat rolled up, or with skins stuffed with hair (p. 287).

which the children lie as if their backs were glued to them, being cradled in linen and kept on with swath bands run through the sides of the boards. To these boards they tie strings, by which they hang their children on the branches of trees" (vol. 11, p. 7). "As soon as their children come into the world they dip them in warm water up to the chin." The Dacotahs, Alentian Islanders, etc., use cold water. "After this they swathe them down upon little boards or planks, stuffed with cotton, where they lie upon their backs" (vol. 11, p. 43).

Canada line, have for many years bought their cradle-boards from the whites or made them of material bought from a white man (Figs. 39, 40). The specimen illustrated has the back carved in flowers and birds, and painted blue, red, green, and yellow. The cleat at the upper end of the back is a modern chair-round. The foot-board is a small shelf or bracket, on which the child's feet rest.

An interesting relic of savagery on this quite civilized cradle are the notches in the awning-bow, falling down over the ends of the cleat, extended and held in place by braces of leather thong. The hoop serves many functions, such as support for sunshade, rain protector, mosquito net, ornaments, dangling trinkets to please the child, etc.

1806. Cradle back-board, carved in peacocks, and painted bright colors. Square at top. Awning frame mortised at ends, which allow them to slide over awning-bar. Held down and guyed by stays on opposite side. Has a movable foot-rest at bottom. Thongs along sides

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Jenry's, T. (Nat. and Civil Hist. of French Dominions in North and South America, London, 1769, fol.), says of Algonkian *Têtes de Bou*: "The Round-Heads . . . take their name from the figure of their heads. . . . It is believed that the mothers . . . form the heads of the children into this shape when they are in the cradle" (part 1, p. 47).

Lancourt, Duke de. (Travels through the United States, etc. London, 1799. It.) Very much the same account as that of Weld, etc., is given by this traveler of the cradle-board used by the Iroquois tribes. He says, however, that "suckling children are generally suspended in a basket fastened to the ceiling" (vol. 1, p. 177).

Wood, L. (Travels through North America and Canada. London, 1799. It.) As the result of general observation of the tribes of Canada and the Lakes, he says that "an Indian child, soon after it is born, is swathed with cloths or *skins* (vide Long, Notes), laid on its back, and bound down on a piece of thick board, spread with soft moss. Hoops protect the face. The cradle-board is suspended on the mother's back when traveling, otherwise hung by the head-strap. Infants are also put in hammocks, and when able to crawl are released from the cradle-board (p. 3-7).

"Their infants are borne with haire on their heads, and are of complexion white as our nation, but their mothers in their infancy make a bath of Walnut leaves, huskes of Walnuts and such things as will stain their skime for ever, wherein they did & washe them to make them tawny. The colour of their haire is black & their eyes black."

NOTE.—The idea that the Indian was born white was very commonly entertained in the first half of the seventeenth century. Lechford, in his "Plaine Dealing," p. 50, says: "They are of complexion swarthy & tawny. Their children are borne white, but they bedaube them with oyle & colours presently." Josselyn also speaks of the Indians "dying their children with a liquor of boiled Hemlock-Bark." (Two Voyages, p. 128.) Speaking of the Virginia women Smith says: "To make their children hardie in the coldest mornings they them wash in the rivers, & by paynting & oymments so tanne their skinnes that after a year or two no weather will hurt them." (True Travels, vol. 1, p. 131.) Strachey gives a more particular account of the supposed process: "The Indians are generally of a enllour browne or rather tawny, which they east themselves into with a kind of arsenic stone, & of the same hue are their women, howbeit yt is supposed neither of them naturally borne so discolored; for Capt. Smith (lyving somtymes amongst them) affirmeth how they are from the womb indifferent white, but as the men, so doe the women dye & disguise themselves into this tawny cowler, esteeming yt the best beauty to be neerest such a kynd of murrey as a sodden quince is of (to liken yt to the neerest coulour I can), for which they daily anoint both face & bodies all over with such a kind of fucus or mguent as can east them into that stayne." (Historie, 63.) ("New English Canaan." Prince Soc. Boston, 1883, p. 147.)

"These infants are carried at their mothers' backs by the help of a cradle made of a board forket at both ends whereon the childe is fast bound and wrapped in fures; his knees thrust up towards his bellie, because they may be the more usefull for them when he sitteth, which is as a dogge does on his bumme; and this cradle surely preserves them

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better than the cradles of our nation, for as much as we find them well proportioned, not any of them crooked-backed or wry-legged; and to give their character in a word, they are as proper men and women for feature and limbs as can be found, for flesh and blood as active." (*New English Canaan*. Prince Soc. Boston, 1883, p. 147.)

The Choctah flatten their foreheads with a bag of sand, which with great care they keep fastened on the skull of the infant while it is in its tender and imperfect state. Thus they quite deform their face and give themselves an appearance which is disagreeable to any but those of their own likeness.\* (*Adair's American Indians*, p. 284.)

\*The Indians flatten their heads in divers forms, but it is chiefly the crown of the head they depress in order to beautify themselves, as their wild fancy terms it, for they call us long heads by way of contempt. The Choctah Indians flatten their foreheads from the top of the head to the eye-brows with a small bag of sand, which gives them a hideous appearance, as the forehead naturally shoots upward, according as it is flattened, thus, the rising of the nose, instead of being equidistant from the beginning of the chin to that of the hair is, by their wild mechanism, placed a great deal nearer to the one and farther from the other. The Indian nations round South Carolina and all the way to New Mexico (properly called Meehiko), to effect this, fix the tender infant on a kind of cradle, where his feet are tilted above a foot higher than a horizontal position, his head bends back into a hole made on purpose to receive it, where he bears the chief part of his weight on the crown of the head upon a small bag of sand without being in the least able to move himself. The skull, resembling a fine cartilaginous substance, in its infant state, is capable of taking any impression. By this pressure, and thus flattening the crown of the head, they consequently make their heads thick and their faces broad, for when the smooth channel of

Volney, C. F. (*A View of the Soil and Climate of the United States of America*. Philadelphia, 1801. 8 vo.) It is "the custom of the Choctaws to mould the skulls of their new-born children to the shape of a truncated pyramid, by pressing them between boards. This method is so effectual that the tribe is known by the name of the Flat-Heads" (p. 365). Among the tribes near the head of the Wabash, "Weewas, Payories, Sawkies, Pyankishaws, and Muamis. . . . the females . . . carry one or two children behind them in a sort of bag, the ends of which are tied upon their forehead. In this respect they have a strong resemblance to our [the French] gypsies" (p. 353).

Bartram, William. (*Travels through North and South Carolina, Georgia, Florida, etc.* London, 1791. 2d ed., 8vo.) "The Choctaws are called by the traders Flat-Heads, all the males having the fore and hind parts of their skulls artificial flattened or compressed" (p. 515). The infant is placed "in a wooden case," on its back, "a bag of sand being laid on the forehead, which, by continual gentle compression," causes the head to slope "off backwards . . . from the temples upwards. The occiput is received in a concavity "fashioned like a brick-mould" (p. 515).

Heriot, G. (*Travels through the Canadas*. London, 1807. 4to.) "Some of the tribes of Louisiana flatten the forehead of their children, and cause the summit to terminate in a point. . . . Beauty, in their conception, consists in moulding the head to a round form" (p. 318).

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nature is stopped in one place, if a destruction of the whole system doth not thereby ensue, it breaks out in a proportional redundancy in another. May we not to this custom, and as a necessary effect of this cause, attribute their flexible, wild, and cruel tempers? Especially, when we connect therewith both a false education and great exercise to agitate their animal spirits. When the brain, in cooler people, is disturbed, it neither reasons nor determines with proper judgment. The Indians thus look on everything around them through their own false medium, and vilify our heads because they have given a wrong turn to their own." (Adair's American Indians, p. 8.)

Lafitan\* speaks as follows concerning the Southern Indian cradle:  
 "The cradle for the savage children in New France is made throughout pretty and roomy. It consists of one or two very thin planks of light wood, 2½ feet long, ornamented on the edges and rounded at the foot, to give convenience of cradling. The child enveloped in fine fur is as though . . . the united planks, and is placed standing up in a way that it shall hang over a little ledge of wood where its feet are, the point turned under for fear lest they should get hurt, and in order that it should hold the fold by which it is necessary to carry the frame. The swaddling-clothes or furs are held up in front by large bands of painted skin, which does not stretch much, and which are passed and repassed in the small loops of tough skin which hang from the sides of the cradle, where they are firmly fastened. They let these swaddling-clothes hang considerably below the cradle, and they throw them behind when they wish to go walking with the child, or let them fall over a half circle, which is fastened to the planks near the head of the child, and which can be made to turn forwards in order that the child can breathe freely without being exposed to the cold of winter or to the stings of mosquitos or gnats in summer, and in order that it should not receive injury if the cradle fell. They put over that half circle little bracelets of porcelain and other little trifles that the Latins call *crepundia*, which serve as an ornament and as playthings to divert the child. Two large lengths of strong leather, which come out from the cradle at the head, enable the mother to carry it everywhere with her, and to fasten below all their other bundles, when they go to the fields, and to suspend to some branch of a tree, where cradled and soothed to sleep by the wind, while she works.

"The children are very warm in the cradle and very easy, for besides the furs, which are very soft, they put much down taken from the calamus (cat-tail, rush?), which they stuff in a wad, or perhaps the pounded bark of the peruche (birch?), with which the women scour their hair to invigorate it. They are also very careful so that it can not soil their furs; by means of a little skin or a rag which they pass between their thighs, which hangs out over the fore part, they can attend to their

\*Moeurs des Sauvages Americains, vol. 1, p. 597.



natural needs without the inside being wet or soiled, except the down, which is easily replaced with new.

"Some nations in Louisiana, to whom the French have given the name of flat heads, \* \* \* have a groove practically in their cradle, in which the mother puts the child's head; she applies on the front and back of the head a mass of clay which binds and bears down with all force. She cradles the child all the time until its head has taken its shape, and when the sutures of the head have taken consistency. The children suffer extremely, become almost black; a white and viscid liquor comes from the eyes, nose, and ears; they suffer much more from the uneasy situation, where they are forced to pass all the time during the first months of their infancy, but it is the cost of becoming beautiful by art and the suffering to get that charm which nature refuses.

"The Caribs and most of the Southern Indians have also flattened foreheads and pointed heads. Their mothers fasten the head down with little boards and pads of cotton bound strong back of the head.

"The child has no other cradle but a hammock proportioned to their height in which the mothers can suspend them and transport them very commodiously, and where the children are cradled all naked, without any pain from confinement.

"The Indians, which are called in Canada (le gens de Terres) *Garlegougnouan*, have a different taste from the Flatheads, for their beauty consists in having a round head; thence they are called 'Bulle Heads'" (pp. 593, 597).

"The first years the child is kept all naked in the cabin to keep its body from being injured by the air. When larger it works for the family. They carry water and little billets of wood; this they regard as sport. Up to puberty they neglect their person; no ornaments are worn until they are enrolled in the body of young men. They are educated like Spartans" (p. 597).

"Women strong and robust but are not prolific. The *exceñte* woman does not take care of herself; she carries heavy burdens and works harder as she approaches her time. They say this violent exercise facilitates their parturition and makes the child more robust. No one can deny that they do bring forth with surprising ease. If caught in labor away from the cabin they attend to themselves, and are apparently able to do their regular work the same day" (pp. 590, 591).

"They do suffer and die sometimes, but they bear their pain with such fortitude that they do not seem to suffer" (p. 592).

"Some Southern Indians think if the women do not bear their part with fortitude the children will inherit their weakness, and they kill those children that are born of such a mother. They kill the mother of a still born child, and also sacrifice one of twins, because one mother is not enough for two children" (p. 592).

"The Indians will not give their children to others to bring up. If it happens that the mother dies while the child is yet in the cradle, r

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is brought up in the family, and what appears strange, old grandmothers, who have passed the age of having children, have their milk return to them, and take the place of the mother. Indians love their children with an extreme passion, and although they do not show their affection by lively caresses, as do the Europeans, their tenderness is, however, not less real. They suckle their children as long as they are able, and do not wean them but from necessity. I have seen children three or four years old taking milk with their younger brothers" (p. 593).

In South America the same custom seems to obtain that we have seen in North America, namely, in the tropics the carrying of children in the shawl or sash, and bedding it in the hammock; while in the colder regions the cradle-frame appears. Frames corresponding to some in North America are found in Peru. Simon de Schryver, in his *Royaume d'Araucanie-Patagonie* (1887), figures at page 21 an Araucanian woman carrying a child in a frame (Fig. 39), which seems to be nothing more



Fig. 39.

## ARAUCANIAN WOMAN CARRYING CHILD

(From Simon de Schryver's, "*Royaume d'Araucanie-Patagonie*,")

than a short ladder, with cross-bars. On this frame the child is lashed, the head being perfectly free, except that the lower part of the occiput rests against the top cross-bar, as in the case of the Polynesian pillow. In addition to her living freight the woman carries in front a bag of

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provisions suspended by a cord depending from the head-strap at its junction with the cradle-frame.



Fig. 40.

TELLESH-GAYSI—BRAYN—A CHILD-BEARING WOMAN WITH PROVISIONS.

From the collection of the U. S. N. M.

A feature in the weaving of the Patagonian wallet is worthy of attention, although its description would be better in a paper on weaving. There is in the National Museum a game-bag from Mackenzie River, and another from Kodiak, made of exceedingly fine babbiche or buckskin cut into string. The weaving is effected by means of an endless chain of half-hitches, each loop caught into loop below. In Central America, everywhere, thou sands of open net-work bags of all sizes are

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made from the pita fiber, the strings of which loop in the same manner. In Peru the same stitch occurs, and now from Patagonia and Tierra del Fuego we receive examples of the same method of weaving.



Fig. 11.

OSLJAK "BABY JUMPER."

(From Seckholm's "Siberia in Asia.")

The insertion of a rod or a bundle of rushes serves to convert the open net-work bag into a water-tight wallet or a rigid basket.

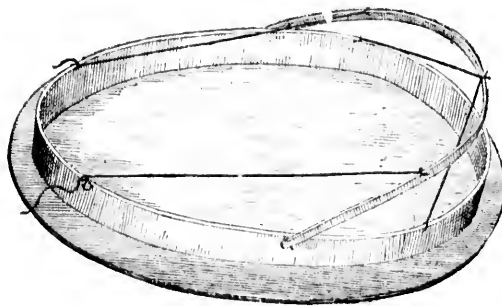


Fig. 12.

OSLJAK CRADLE.

(From Seckholm's "Siberia in Asia.")

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Another method of carrying children is shown in Fig. 40. The woman represented is a Turkish Gypsy, and the child has been placed in a peddler's pack for convenience of carrying.



Fig. 40.  
APACHE SQUAW CARRYING A CHILD.  
(From photograph in U. S. N. M.)

The resources of the Museum do not justify anything like an exhaustive treatment of the eastern continent. In the three figures shown (Figs. 43, 44, 45) we see the Northern device, in which the safety of the child from cold is the main source of anxiety. The Japanese mother is concerned partly with temperature and partly with transportation. The African mother consults transportation alone. There is nothing in the ordinary treatment of the child to occasion a deformity of the cranium. Any change of the shape of the head must be attributed to congenital causes or to custom.



Fig. 41.  
JAPANESE WOMAN CARRYING A CHILD.  
(From Racinet's "Le Costume.")



Fig. 45.  
AFRICAN WOMAN CARRYING A CHILD.  
(From photograph in U. S. N. M.)

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NOTES ON THE ARTIFICIAL DEFORMATION OF CHILDREN  
AMONG SAVAGE AND CIVILIZED PEOPLES.

[WITH A BIBLIOGRAPHY.]

By Dr. J. H. PORTER.

The accompanying notes are collected from various sources as a supplement to Professor Mason's paper on "The Cradles of the American Aborigines."\* The time allotted did not permit the compiler to exhaust the subject, but enough is here given to show the practices concerning children in their first year throughout the world, and the varied beliefs obtaining as to the effects of such treatment. In the future the subject will receive more careful and systematic study.

The author embraces this opportunity to express his obligation to the librarians of the State, War, and Navy Departments at Washington for many courtesies.

Intentional modifications of the form of the head, although less general than other fashions by which conformity to an ideal of beauty has been attempted, have, nevertheless, been widely prevalent among races of men, but can not be said to include all the variations from an average cranial type actually existing in nature. The ethnical classification of M. Topinard (*Éléments d'Anthropologie Générale*) displays deformation with reference to race in a manner which fulfills all practical requirements. Deformity is, however, as real when slight as when excessive, and apart from those distortions he has described, from the many which are due to pathological causes, and the yet more numerous deviations from symmetry which unintentionally exerted pressure produces in the incompletely ossified skull, there still remain those variations in the processes of nutrition and growth through which asymmetry becomes the rule not in the head and not in man only, but in the homologous parts of all axially developed animals.

As a matter of fact, and exclusive of the embryological identity of their elements, an ideal head is no more demonstrable than an ideal vertebra; and whatever may be hereafter accomplished, at present the anatomical and physiological constants of neither can be determined in detail. It therefore appears to be inexact to speak of the deformities of an organ whose conformation has not been distinctly ascertained. In addition to this, only a small portion of mankind have arrived at any common judgment on the subject of cranial contour, and wherever a standard is furnished by such a consensus of opinion, this is derived from art and not from science. Both empirical knowledge and physiological principles justify the general conclusion that the artistic form is that which is usually associated with superior brain power; but it does not at all follow that an alteration of outline that would destroy the former would similarly affect the latter. Such facts undoubtedly dis-

\* Most of the bibliography relating to the artificial deformation of children in North America is embodied in Professor Mason's work.

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Fig. 45.  
WOMAN CARRYING A CHILD  
(Photograph in P. S. M.)

parage alike the methods and the results of anthropological research in certain directions, but they neither obviate the necessity of initiating further study from existing information, nor impugn its value as a whole.

In considering the natural history of the human head, account must be taken of the fact that man, while not alone in this respect, is nevertheless an exceedingly aberrant form among the Mammalia. On any theory of life, however, except that of special creation, and independently of conflicting estimates of the systematic implications of structure, the organization of this most highly specialized being must be regarded as the outcome of descent, with modification, and should therefore be considered in connection with that of the groups to which man is affiliated.

As has been said, there is no absolute form for the head or for the vertebrae of which it is composed, and the fact that all classifications resting upon its features have failed, does not encourage the hope that the results sought through craniometry will be attained by means of its descriptive anatomy. All that can be properly affirmed is, that during the immemorial series of adjustments by which the mammals culminated in man, and in which evolutionary changes of all orders are included, the human head assumed an incompletely distinctive form, which is, both in itself and in the causes which determine its variations, more or less clearly revealed in the tribal history of mankind. The statement that the anthropoid head becomes less human with development has been generally united with the assumption that this implies important generic differences between them, and if the observation were true in the sense in which it is for the most part understood, it would do so. Its special significance is, however, detracted from by the general truth that in zoology the rule is that, for obvious reasons, young creatures are less differentiated than those which are mature; while, on the other hand, the difficulty of discriminating between the adult brains of some of the higher apes and those of certain savages, may be considered as qualifying the former assertion to so great a degree as to suggest error, or at least inexactness, in the observation. No doubt the mistake is partially attributable to misconceptions arising from an idea of the fixity of species, but in itself, the error is involved in all comparisons between unlike things. To found a parallel upon the external tables of the skull, as if these were equally characteristic and similarly developed in a gorilla and a man, is to include in the terms dissimilar elements, and thereby vitiate the comparison. The contours of the head in these instances are differently related, and, considering the plates of the skull especially, the external table of the ape's cranium is much more prominently associated with the muscular apparatus than is the case with man, in whom the subordination of the entire head to the encephalon is exceptional. This is but a single illustration of the general fact that throughout the vertebrate class the cranium proper, amid innumerable subordinate variations, assumes the

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more specialized character of a brain-case as we ascend in the organic scale. In fishes, where the head contains other organs than those of the nervous system, its indefinite relations to the cerebro-spinal axis are conspicuous. Among the Reptilia, though containing only the brain, the extreme disproportion between the head and its contents indicates that its conformity with the cerebral ganglia is subsidiary to other conformities; while in birds the limited range of the cranial cavity, as contrasted with its range when compared with the bulk of the body, conveys in a modified form the implication of increasing specialization of the head. As might be expected, the anatomical evidence furnished by the Mammalia is corroborative of that derived from lower groups. No variation, however extreme, is competent to free a structure from the influence of heredity, and it might be argued *a priori* that the human head would have the outlines of its history delineated in the morphology of the primates.

The facts in this instance justify the anticipation. As in the developmental record of birds, among which the ornithic stamp, either general or special, is but gradually and indirectly evolved, so also with the more immediate congeners of man, where the more salient characteristics of his type, distributed throughout a group of anthropoids, do not admit of consecutive arrangement, and can not be attributed in their totality to any specific form. From the primates, as from the other mammalian sub-classes, a cranial figure involved in the metameric development of the encephalon, gradually disengages itself and becomes more regular and more definite in its cerebral relations as the grade of organization is elevated; so that the profiles associated with ganglionic mass increase in prominence, while those which are otherwise associated correspondingly diminish.

These anatomical traits link themselves naturally with physiological co-ordinates. Everywhere encephalic structure is related, though not directly, to function. Enhanced importance in the brain implicates increased solidarity in the entire organism. As the cerebral elements grow in multiplicity, variety, and complexity, this development is concomitant with cranial amalgamation, with progressive obliteration of the features attaching to lower forms, with condensation of the encephalic ganglia, with a more direct correspondence between the skull and brain, and finally with a greater conformity of the body with the head.

Whatever phylogenetic significance may be found in these facts, their morphological and physiological bearing is unmistakable. Through quite various structural gradations there appears, though not in linear sequence, "a series of forms," which ultimately display in modifications of cranial contour a more definite coaptation of the envelope to its contained viscus in developmental progress, and in the falling away and weakening of its muscular attachments, the paramount function of the skull as a brain-case, and the subordination of its structure to that of the organ which it incloses.



It is not necessary here to consider the elements which compose organic form or the conditions that determine their arrangement. The process, so far as the head is concerned, has been, to a great extent, masked among the vertebrates by adaptation to other than encephalic relations, while the part was carried through the cartilaginous, semioosseous, amalgamated, and consolidated types of crania, to one which, as representative of the most important organ in the body, has been commonly selected by the anthropologists for investigation, and generally believed to promise results corresponding with its position and the function it sustains. Tried by the tests afforded by craniometry, however, it appears to have little or no taxinomial value, since the outcome of these measurements is to transpose races and fuse peoples otherwise known to be distinct.

At the same time, in man, cranial outlines are unquestionably preponderantly determined by the brain, while the features by which its action is obscured have been so frequently and completely described that they need not be recapitulated. But although this statement holds on the morphological side of the question, from the physiological standpoint the case is not the same. The brain limits the shape of the head and is itself limited by the laws of growth, heredity, and structural correlativity; but in the phenomenal series cerebral development is antecedent to cranial evolution, and the relation subsisting between these—a relation which is in its nature causal, so far as shape is concerned—places the factors upon different planes. In virtue of preponderant function and equivalent preponderance of structure in special ganglia, a general form of head has been attained; but from fluctuations in the energies by which it was produced in correspondence with variations in the conditions of life, this form varies both in human and pre-human history, and so widely as to have thus far prevented classification.

That the organ through which all adjustments to the environment are primarily made should vary among groups whose lowest aggregates are nearly as passive to the direct action of natural selection as beasts, and whose higher forms are but partially and incompletely adjusted, is not surprising; and while it must be assumed upon biological grounds that the plasticity of the brain has lessened since its deviation from the ancestral type, whence issued in divergent lines that of man and his congeners, still, the facts of descent suggest that to its organic variability, and to that expressed in specific adaptations, there must be added a strong inherited tendency in this direction.

The cerebral history of the primates seems to warrant the theoretical conclusion that among these great variability of the head exists.

In Lemuridae, where the cranium relatively to the face is small, and the ethmoidal, tentorial, and occipital planes are greatly inclined towards the basi-cranial axis, the brain scarcely exceeds the base of the skull in length, whereas in Simiidae the encephalon is more than twice as

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long. The anterior cerebral lobes in the Aretopithecini compare in mass with those of anthropoids, while the posterior lobes are more developed than in certain races of men. Among the Platyrrhini great cranial variations correspond with extreme contrasts in brain structure and mass. The low facial angle, inclined tentorial plane, and perpendicularity of the axis of the occipital foramen to that of the cranial base, belong, as in Mycetes, to a type in which the cerebellum is scarcely covered, while in Chrysothrix the posterior lobes of the cerebrum are of relatively greater proportions than in any of the Mammalia: and, moreover, the vertex is arched, the facial angle large, the basi-cranial axis short, as compared with its cavity, and the planes of the occipital foramen and tentorium are in correspondence. The surface of the brain in Cebus is nearly as much convoluted as that of the catarrhine apes, but the sulci fade almost to obliteration through Pithecia, Chrysothrix, and Nictipithecens. On the other hand, by the nearly total structural masking of the annectant gyri of the external perpendicular fissure, the brain in Ateles rises above the catarrhine type.

Diversities such as these, occurring within the limits of a single group, put craniological classification out of the question; but in Catarrhines and Anthropidae differences obtain, which, though less extreme, are equally decisive, and without anatomical details, for which there is no space, it may be said that the heads and brains of Semnopithecini and Colobi vary from those of Macaci and Cynocephali as significantly as the same structures do in the man-like apes. Apparently, then, no typical cranium exists among the simians any more than among men, from whom an artistic preconception has to a great extent concealed its absence.

With regard to this standard of art, also, it must be remembered that it is primarily one of *form*, while, physiologically, form has no necessary connection with the constitution of a ganglion. Such expressions as "nervous arc" and "reflex action" emphasize as if essential, that which, except contingently, has nothing to do with either curves or angles. In "the building of a brain" the terminal elements of nervous tracts are cellular, and agglomeration therefore results in the composition of a mass attached to a pedicle. Nothing which is generally more exact than this can be advanced. Components like these make up the parts and wholes of all nervous systems, and how they have combined in man and his class, and with what degree of uniformity, has already been indicated.

Of course it is not meant that the human head has not an average shape, or that this or any other part whose conformation is due to actions and reactions between an ancestral group and its entire environment, could alter otherwise than infinitesimally under the incidence of discontinuous forces. Nor is it intended to say that the harmony which exists in other instances between an organ and its properties is here ignored. No more than in any other machine or structure can the skull be considered as unaffected by the laws which co-ordinate mechan-

ical and functional fitness with functional and mechanical requirements. But resemblances of this kind are not those which are contemplated in anthropometry, where the relations of structure and function, and of these to the conditions of life, have been disregarded in a search for morphological constants, whose occurrence, under the circumstances, was biologically impossible. Much but not all has been done towards a science of man, when the divergent forms of his class have been united by forms that are intermediate, and when his pedigree has been reconstructed on the basis of kinship. The whole question of race is included in this generalization, although it is not thereby fully explained, neither is it likely to be elucidated by measurements.

Without pursuing the subject further it may be remarked that, abstractly, structure and function are determined in all organisms by the affinities of their units of composition; that complete homogeneity in a group of protoplasts is impossible, and that initial diversities will increase during evolution. The minuteness of these ultimates may not add to the difficulty of comprehension more than is the case with those dealt with by molecular physics and chemistry, but it is otherwise when the plasticity of life is added. That adaptation is connected with changes in function and structure is obvious, but neither in an organism, an organ, nor in the plastidules which compose them, is adaptation a final term in the progress from homogeneity to heterogeneity, from simplicity to complexity, from indefiniteness to definiteness; since, without alteration of elementary composition, there are no conceivable circumstances under which re-adjustment can be effected.

As it is with these phenomena which lie at the foundation of life, so is it with all the vital phenomena to which natural and sexual selection, growth, survival, genesis, heredity apply. Amid all degrees of composition and recombination, function constitutes the substance, adaptation the form of life. Every statical or dynamical distribution of organic energy by which incident forces are met is included in function; and though in large groups of organisms, correlative changes, structural and functional, occur slowly and within comparatively narrow limits, yet they are, in the nature of things, relatively indefinite, but contingently permanent, and do not afford on this subject the data which systematic ethnology requires. Not less than its co-ordinate, the evolution of form, does physiological development press for interpretation in every question relating to race, and the doctrine that all factors by which differences among men are worked out are resolvable into results of the intercourse between these and the conditions under which they are placed, is essentially a corollary from the persistence of force.

Space has permitted but the merest sketch of this subject, but there yet remains a question which sooner or later confronts the investigator of cranial deformities, and this is that of their transmission. Present opinion almost unanimously opposes the belief that these may, in any

degree, be maintained, but the possibility of their being founded, is not denied.

The possibility of the experience of a biological variation, first necessitated by a pre-concept, and equally limited by the limits of the modification.

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degree, be perpetuated when of artificial origin; nevertheless it may be maintained with reason that the grounds upon which unqualified denial rests, are theoretically as untenable, in the present state of anthropological science, as those upon which an unqualified assent could be founded. Future results in this direction will depend largely upon the possibility of connecting facts of observation with those furnished by the experimental physiology of the nervous system. The question is a biological one, and without adverting to what has been said concerning variation, it may be urged that in this, as in all such problems, the first necessity is to view them under biological conditions. This requirement has not in this instance been complied with. Teleological preconceptions seem to have been more or less obstructive of the view, and equally so, incorrect parallels between alterations apparently within the limits of health, and those which involve morbid consequences.

There is no doubt that modifications of development involve functional modifications, and that imperceptible molecular changes in the brain rest on precisely the same basis as perceptible ones in other parts of the body. The inconceivability of spontaneous variation, properly so called, the heredity of function as well as of structure, the certainty that if structure changed by function is transmitted, any alterations of structure which have physiologically altered function must be also inherited, appear to suggest an explanation of certain phenomena connected with this subject, which, except on the principle of descent, do not seem to be interpretable at all.

According to the statements of Mr. Spencer, there is reason to think that special structures of all varieties proceed from the special polarities of their organic units, and that any tissue or combination of tissues will impress the modifications it may have experienced upon its component elements, between which and the aggregate life implies perpetual action and reaction. If this process, as must be generally the case, takes place under normal conditions, the forces manifested tend towards equilibrium without reaching, practically, an exact physiological balance. During these adjustments and re-adjustments, however, one of two alternative results inevitably occurs. Either the structure will take the shape determined by the pre-existing tendencies of its elements, or the aggregate's altered form will mould these into harmony with itself. The question thus becomes one of affection of function, because, for every reason, it must be assumed that structural elements organically changed will, when acting as reproductive centers, engender similar changes.

To oppose to these statements the common assertion that mutilations do not become congenital, is to misconceive their character, and to confound pathological conditions with those which must be normal in order to be effective. It may readily be suspected that the impossibility of inheriting artificial alterations has been too hastily assumed, since this involves an additional assumption, which has not been demonstrated,

viz, that such changes do not become organic because they may occur without implicating function. The profound alterations effected by artificial selection are, of course, due to functional modifications, but it has not been shown that these can not be artificially induced, or that deformation must be universally morbid in character because it is a departure from such standards of organic type as now exist in imagination.

On the morphological side the question seems equally uncertain. Given, however, any cause which will effectually modify function, and modification of structure is inevitable. No naturalist supposes that the digital variations recorded as inherited, or those of the teeth, skin, etc., are attributable to any other cause than physiological change; and the same with transmitted club-foot, harelip, amaurosis, deafness. Further, adjustments by involution take place in nature as well as those by evolution, and although there are no structures whose properties are not originally ascribable to predetermined structural traits, there are yet structures which have no discoverable physiological features; and while morphological species, or species whose specific forms have no biological value, are recognized in zoology, and which, whether permanently or not, are withdrawn from the action of natural selection, it is difficult to see why the production of variety by any means that would effectually change function should be disallowed.

As was stated, there are reasons for suspecting that some such process has occurred among mankind to a limited extent; but whether or not, when all accessible information on the subject is organized, this may not prove to be a misconception attributable to insufficient knowledge, remains to be determined.

#### GENERAL NOTES ON DEFORMATION.

Malte-Brun. (*Géographie Universelle*. Ed. of Lavallée. Paris, 1858. 4to, t. 1.) General remarks on the causes and modes of distortion of the head (p. 303).

Humboldt & Bonpland. (*Voyage*, etc. Paris, 1811. 4to, 3<sup>e</sup> partie, t. 1. "Essai Politique, etc.") Remarks on head-flattening, its character and cause among Indians of North and South America. (Note, pp. 89, 90.)

Jefferys remarks upon the fine forms of the Indians of North America, and says the fact is attributable to "their bodies not being swathed and straitened in the cradle" (part 1, p. 96). The cradle-board was in use among all the tribes described by him; but this error is not surprising in an author who characterizes the Eskimaux as "tall of stature," and speaks of "their flaxen hair, their beards, the whiteness of their skin . . . quite as fair as that of Europeans" (part 1, p. 43). Certain blond tribes do occur among the Hyperborean races, but not where Jefferys places them; although the Eskimaux are not really dark-skinned. With regard to the fine forms so constantly noted among the American and other savages, most writers have ascribed it to their modes of life; Humboldt adding, in the case of the Americans, a certain racial im-  
plasticity. Most of the earlier authorities have evidently judged an assumed ethnological fact from the stand-point of a social theory. There does not appear to be any natural reason why a savage should be better shaped than a civilized man, and that this is the case remains to be shown. There is, however, an excellent reason why those who are physically defective should be eliminated from all aggregates in

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state of savagery, both by the action of natural selection and by that of their fellow-venturers. A very large body of proof could be readily brought forward to support the view that Wrangell's statement concerning the Chukches held true of most peoples in a similar social phase, viz: "La mort attend l'enfant qui a le meilleur de nature avec quelque difformité." *Le Nord de la Sibirie*. Paris, 1843, vol. 1, p. 267. Kennan and Bush made like observations in the same region, and Capt. John G. Bourke, U. S. Army, has pointed out that in the south this custom is mentioned by Padre Gumilla ("Orinoco," Madrid, 1741, p. 304), and by Clavigero (*Historia de la Baja California*. Mexico, 1859, p. 27). I do not recall any reference of the same kind in Hennepin, Le Clerc, Charlevoix, etc.; but though the custom may have existed among the northern tribes, despite Robertson's assertion that all the American Indians killed the children who "appeared feeble or defective" (*Hist. Dis. & Set. of America*. N. Y., 1856, p. 144), there is no doubt that in the literature of travel it is more frequently mentioned as occurring among the southern tribes; and this may have been one reason why the earlier discoverers, Columbus, Vespucci, Verrazano, &c., have spoken only of the fine appearance of the natives. The same contrasts, however, are found in savage life in this as in other respects. Captain Bourke confirms from personal observation the statement made in Emory's "Reconnaissance" (p. 61), that among the Apaches the deformed are sometimes well cared for. He also refers to a like mention in Francis Parkman (*The Jesuits in North America*. Boston, 1867, Introductory, xl.), and also to Peter Martyr's narrative (*Hakluyt, Voyages*, vol. 5, p. 357).

In connection with head-flattening in America, Humboldt (*Political Essay on New Spain*. London, 1814. 8vo, vol. 1) asserts that the back-head is naturally flat (p. 155). Also that the American cranium is normally "depressed backwards . . . among nations to whom the means of artificially producing deformity are . . . unknown." The Aztecs "never disfigure the heads of their children." The Mexican, Peruvian, and Atrean heads—all flattened; those Bonpland and himself procured were natural. "Certain hordes do compress the heads of children" (pp. 151, 155).

Squier (*The States of Central America*. N. Y., 1858. 8vo) quotes Valenzuela to the effect that among the Indians found by the Spanish at Lacandon (Dolores), Guatemala, "the cradles for their children were made of reeds" (p. 567).

Under the heading *Tête*, *Encyclopedie des Sciences*, etc., Neufchâtel, 1765, is the following: "Il est parlé dans les voyages et dans les géographies modernes, de certains peuples qui se rendent la tête plat que la main, et qui mettent la tête de leurs enfans, des qu'ils sont nés, entre deux presses, ou planches, sur le front et le derrière de la tête pour l'applatir."

## NOTES ON AMERICA.

Bancroft. (*Native Races of the Pacific States*, N. Y., 1873, vol. 1.) Chichimec women carried their infants on the back, "wrapped in a coarse cotton cloth, leaving the head and arms free" (p. 633). The cradle was a wicker basket suspended from a beam or bough (p. 633).

Gomara (*Con. Mex.*, fol. 318) states that the occiput was flattened among the Nahuatl nations by an arrangement of the cradle, this form being considered becoming. (*Bancroft, Native Races*, etc., vol. II, p. 281.)

Humboldt's statement that the Aztecs did not distort the head was, as Bancroft remarks (*Native Races*, vol. II, p. 281), too sweeping. That the custom "was practiced to a considerable extent in remote times by people inhabiting the country seems to be shown by the deformed skulls found in their graves, and by the sculptured figures upon the ruins." Klemm states that "the cradle consisted of a hard board to which the infant was bound in such a manner as to cause the malformation."

Sahagun, Torquemada, Clavigero, Brasseur de Bourbourg, Carbazal Espinosa say that when a Teochichimec child was born on a journey "the new-born babe was placed in a wicker basket and thrown over the back of the mother." (*Bancroft, Native Races of the Pacific States*. N. Y., 1875, vol. II, p. 271, note.)

"Torquemada (Book XIV, ch. 21) states that the Indians, "in Mexico, "used to deform their heads with a view to appear more formidable." (Spencer, Des. Soc. Ancient Mexicans, Central Americans, etc., p. 27.)

Landa (8 XX) "The Indians of Yucatan are, \* \* \* as a rule, \* \* \* bow-legged, for in their infancy their mothers carry them about suspended at their hammock-bones. They were made "squint-eyed," and their heads were flattened artificially. (Spencer, Des. Soc. Ancient Mexicans, Central Americans, etc., p. 27.)

Landa (XXX) describes the process: "Four or five days after birth the child was put on a small bed made of rods, and there, the face being underneath, the head was put between two boards, in front and behind. Between these they compressed it \* \* \* until the head was flattened and shaped like their own." (*Idem*, p. 27.)

Bancroft. (Native Races of the Pacific States. N. Y., 1873, vol. 1.) The Quiché woman (Central America) carries her baby on her back "in a cloth passed around her body" (p. 701).

Bancroft. (Native Races of the Pacific States. N. Y., 1875, vol. II, 8vo.) The Nicaraguan and Yucatan infants' heads were compressed and permanently flattened between two boards as a sign of noble birth. Squier asserts that occipital flattening was effected by the cradle-board among the Quichés, Cakchiquels, and Zutugils (pp. 731, 732). Don Horatio Guzmán, minister from Nicaragua, informs me that no compression of the head and no swathing of the infant is now practiced in any part of that country.

Bancroft. (Native Races of the Pacific States. N. Y., 1873, vol. 1.) The Smoo Indians of the Mosquito Group flatten the forehead by a process like that in use among the Columbians (p. 717).

Fuentes. (Palacio, p. 196.) In Guatemala children were fastened "to a board by means of straps wound round the body \* \* \* from the feet to the shoulders, in consequence of which all the Indians have the backs of their heads smooth and flat." (Spencer, Des. Soc. Ancient Mexicans, Central Americans, etc., p. 28.)

Jefferys, F. (Nat. and Civil Hist. of French Dominions in North and South America. London, 1760, fol.) Among the aborigines of Hispaniola "the singular conformation of the head \* \* \* is effected by art." Mothers pressed their infant's skull, either by hand or with boards, until it was distorted, "and in a manner bent back upon itself" (Part II, p. 8).

Oviedo. (Historia General y Natural de Indias, book II, chap. 5.) His statement of head-flattening is rather vague. "Porque al tiempo que nacen los niños les aprietan las cebezas," etc. The width of the front head, which he remarks as the result of artificial interference, points to the same form, and like appliances, noticed by Porto-Seguro, and others, in Brazil. (*Idem*, book II, chap. 3.) Gomara is cited as giving the same evidence concerning the natives of San Domingo. He says they flattened the head with cotton compresses for the purpose of enlarging the face. "Aprietan á los niños la cebeza muy blando, pero mucho entre dos almohadillas de algodón, para ensancharles la cara," etc.

There seems to have been some confusion in Gomara's mind on this subject—Bernal Diaz says there was on all subjects. At all events he gives another account of the manner in which the infant's head was distorted, which amounts to this: that it was done by the midwife at the moment of birth, or shortly after. In this case, a very common one among different tribes, the fact apparently indicates gradual extinction of the custom, since the effect of simple manipulation would be temporary, and where distortion implies as much as it sometimes does, its absence exposes the individual to the greatest misfortunes.

Topinard. (Éléments d'Anthropologie Générale. Paris, 1885, 8vo.) Remarks of forms of distortion by manipulation alone that they must be impermanent—"incapables de produire une déformation contenue" (p. 756). Prof. William H. Flower holds the same views, and, indeed, the fact is physiologically self-evident unless the manipulation were of an unprecedented kind.

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Major, R. H. edition, Hakluyt says, of the native each leg two beyond the ankle above-mentioned them" (p. 39).

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Las Casas (Apologética Historia. Madrid, 1875, chap. 31) remarks that in Peru head distortion was distinctive of the Inca family and of the highest nobility. "Privilegio grande concedian los del Perú á algunos señores y que ellos querian favorecer" (p. 396, *vide* Marcot, notes).

Major, R. H. (Select Letters of Christopher Columbus, etc. London, 1870. Second edition, Hakluyt So. Pub.) Dr. Chanca, fleet surgeon on Columbus's second voyage, says, of the native and Carib women in the West Indies, that the latter wore "on each leg two bands of woven cotton, the one fastened round the knee, the other round the ankle; by this means they make the calves of their legs large, and the above-mentioned parts very small. \* \* \* By this peculiarity we distinguished them" (p. 30).

Dr. Chanca supposed this custom to depend upon an idea that the distortion was becoming—"que esto me parece que tienen ellos por cosa gentil" (p. 30).

De Rochefort, C. (Histoire Naturelle, etc., des Isles Antilles. Rotterdam, 1658. 4to.) Notice of head and nose flattening among the Caribs (p. 318).

Humboldt and Bonpland. (Voyage, etc. Paris, 1800. 4to, seconde partie, p. 11. Relation Historique.) Distortions practiced by the Caribs on the Orinoco (p. 235).

Squier, E. G. (Nicaragua, etc. New York, 1852. 8vo, Vol. II.) Head-flattening among aborigines. Process and local origin of custom (p. 345). *Vide* Relacion of Fray Bobadilla on the same points. (Archivo de Indias.)

Heriot, G. (Travels Through the Canadas. London, 1807. 4to.) "The Caribs have their foreheads flattened. \* \* \* The head of the infant is compressed into this shape by placing on its brow a piece of board tied with a bandage, which is allowed to remain until the bones have acquired consistence" (p. 318).

Heriot, G. (Travels Through the Canadas. London, 1807. 4to.) "Carib girls have cotton sock woven to the leg, and "so closely \* \* \* that the calf thereby acquires more thickness and solidity than it would naturally possess" (p. 307).

Armas, Juan L. de. (Les Crânes dits Déformés. Havana, 1885.) This is a paper read before the Anthropological Society of Havana, November, 1875, to prove that mechanical deformation of the head was never practiced in the West Indies or on the continent.

Gravells, Vilanova and Areas. (Rapport présenté a Madrid, le 21 Mars, 1874.) This was to the effect that certain crania from Cuba, taken to be flattened Carib skulls, could not be identified as artificially deformed, but were probably natural heads. The text is, "having noticed that in the front and back part of the head the depression is not uniform, the commission is inclined to consider the flattening as natural, etc." These skulls seem to have been found by Don R. Ferrer, who very truly says that they can not be regarded as specimens of head-flattening among the Caribs, because there were never any Caribs in Cuba. (De Armas, Crânes dits Déformés, p. 7.)

De Armas (Les Crânes dits Déformés) says that no such practice could have been general in America for various reasons, *viz* it was difficult, tedious, and painful, and would have been destructive to the intellect (?); also that the Indians, though savages, were men with natural feelings toward their offspring which would have prevented them from perpetrating a custom so destructive as distortion of the head (p. 14 *et seq.*). Having given this illustration of his knowledge of the literature of anthropology, he declares that neither among the Peruvian mummies nor in the existing race could von Tschudi and Rývero discover a justification of the theory of mechanical deformation. A fact, and a singular one, but no more decisive than Robertson's statement that the mound skulls of North America are all normal (pp. 14, 15). In conclusion he remarks that "there is no basis, scientific, historical, or rational, on which to rest the affirmation that there were \* \* \* and are \* \* \* parts of America in which the natural formation of the head was (or is) modified by mechanical means." And more particularly is this a self-evident truth with regard to the Caribs of the Lesser Antilles: first, because none of the earliest chroniclers speak of the custom; and second, because the crania of this people have not the form attributed to them. Of course it was not possible for de Armas to deny the unsym-



metrical contour of certain skulls, but he asserted that this was natural, and if the statement could be relied on, none could be made of more importance. The weight of evidence is, however, overwhelmingly against him.

De Armas also asserts that Oviedo was the originator of the idea that distortion of the cranium was customary among the Indians of San Domingo, etc., but Gomara, Las Casas, De Leon, and Garcilasso de la Vega make like statements, and the evidence includes West Indian, Peruvian, Floridian tribes.

Walker (Colombia. London, 1822. 8vo) quotes Humboldt to the effect that among the Caribs of Panapana "the women \* \* \* carried their infants on their backs." They also, for the sake of adornment, compress the thighs and legs by "broad strips of cotton cloth, by which" the flesh \* \* \* was swelled in the interstices. \* \* \* They attach great importance to certain forms of the body. (Vol. 1, p. 545.)

Heriot, G. (Travels through the Canadas. London, 1807. 4to.) "The natives of South America generally make use of hammocks of cotton or of the interior bark of trees. \* \* \* This they suspend in their cabins and sometimes on the boughs of trees" (p. 287).

Señor Mutis Duran, of the Colombian legation at Washington, states that no tribe of Indians known to him in New Granada or Colombia distorts the head, but that cranial compression may be practiced by other tribes of this area which he had not observed. Bandaging infants with the idea of preserving the symmetry of their forms is general among all classes. The cradles used by the wealthy are imported or made after European models. Among the poorer classes there are two forms of cradle in use—one a boat-shaped case of light wood or bamboo, which will rock on any plane surface, and another constructed of similar materials and of like form, which is suspended from the end of a crooked rod and swung in the air.

Hilhouse, William. (Warow Land of British Guiana. Jour. Roy. Geo. Soc. London, 1831. Vol. IV.) Dr. Hancock remarks (note, pp. 332, 333, on Hilhouse's account of the Indians seen here) that "these tribes have also," *i. e.*, like the coast tribes of the Marañon, "the spread in the foot, or duck's foot. \* \* \* Their feet and toes are spread out in the manner most suitable for walking on the muddy shores and marshes they inhabit."

Im Thurn, E. F. (Among the Indians of Guiana (*i. e.*, British Guiana). London, 1883. 8vo.) Head-flattening customary among people of upper Essequibo River; formerly prevalent among chief tribes throughout Guiana and among all "true Caribs" (p. 191). Distortion of women's legs by Caribs (p. 192).

Ploss, Dr. H. (Das Kind im Brauch und Sitte der Völker. Leipzig, 1881. 2 Aufl., 2 Band.) Description of the treatment of infants in Peru under the Incas (*Idem*, p. 57). The same with respect to children in Asiatic Turkey and Chinese Turkestan (*Idem*, p. 60). Remarks on the effects of position at rest (*Idem*, pp. 81, 82). Statements concerning the cradle-board and head-flattening in America (*Idem*, pp. 101, 102). Description of the suckling-board and swaddling of infants among the Maronites and Modern Germans (*Idem*, p. 113, 114).

Squier, E. G. (Peru, etc. New York, 1877. 8vo.) Distorted Aymara skull from Chulpas (p. 244).

Appendix B. Extracta from Fourth Annual Report of Peabody Museum, Cambridge. Remarks of Professor Wyman "On crania. Two modes of distortion, their effects," etc. (pp. 580, 581). *Vide* Padre Arriaga on this custom.

Priehard, J. C. (Researches into the Physical History of Mankind. London, 1811. 4th ed. 8vo) quotes Spix and Martins on the separation of the great toe among the Paris, Curopos, and Coroados, South America.

Marcy, P. (Travels in South America. London, 1875. 4to.) Head-flattening formerly practiced by Peruvian Conibos. Obsolete within two generations. All very old people seen by Marcy had distorted crania; no young persons. (Vol. II, p. 40, and note.)

Acosta, Joa. (p. 24). The Pauches (Chibchas) compressed the skulls of infants be-

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teen boards into a "pyramidal" shape. (Spencer, Des. Soc. Ancient Mexicans, Central Americans, etc., p. 28.)

*Idem.* Lengthening (apart from piercing) the lobe of the ear was a royal fashion of the first four Incas. After Mayta-Cupus it became designative of the Curacas (caciques) of the body guard. Now prevalent among certain tribes of the Amazons, e. g., the Orejones (Spanish), broad-ears. (Vol. II, p. 270.)

Piedrahita. (Book I, ch. 2.) The Coyaimas and Natagaymas (Chibchas) "have the custom of putting the tender head of a new-born child between two boards . . . in such a way that it . . . gets flattened." The Pichaos and Panches of the same stock do this also. (Spencer, Des. Soc. Ancient Mexicans, etc., p. 28.)

*Idem.* Compression of the head into the shape of "a bishop's mitre." (*Vide* Portogeuero.) Now obsolete among the Omaguas or Flatheads—a Spanish corruption of the Quichua Omahuas. These are an emigrant stock—the Umahuas, called by the Tupinambas of Brazil Icanga-peña (flatheads), which was contracted and corrupted by the Portuguese into Cambebas, whence La Condamine's mistake. (*Vide* Ref.) He mistook a title for a race name. (Vol. II, 310-312.)

Cieza (ch. 100) says of the Peruvian Collas that "their heads are very long and flattened behind, because they are pressed and flattened into what shape they choose during childhood." (Spencer, Des. Soc. Ancient Mexicans, Central Americans, etc., p. 28.)

Owen, Prof. R. (Anatomy of the Vertebrates. London, 1866. 8vo.) In the Inca race the skull "is high behind, owing to the habit of carrying the infant with the back of the head resting on a flat board, the pressure usually producing unsymmetrical distortion of the occipital part of the skull." (Vol. II, p. 567.) The same statement is made concerning the Patagonians. (Vol. II, p. 568.)

Cieza (ch. 50). Among the Caraquees of Peru, the child's head was pressed between boards, so that it "was long and broad, but flat behind." The Indians said this was conducive to health and vigor. (Spencer, Des. Soc. Ancient Mexicans, Central Americans, etc., p. 28.)

*Idem.* Pls. Nos. 386, 387, and 388, vol. II, p. 567, exhibit artificially distorted skulls of the ancient Peruvians from Titicaca.

Meyen (p. 36) mentions a decree of the Lima Synod of 1585 against flattening the head. Rivero and Tschudi say that the irregularities in crania from the coast of Peru "were undoubtedly produced by mechanical causes" (p. 32). Santa Cruz, Narratives, p. 78, states that Manco Capac introduced head flattening to make the people silly and easily ruled. (Spencer, Des. Soc. Ancient Mexicans, etc., p. 28.)

Marcy, P. (Travels in South America. London, 1875. 4to.) Notice of custom of distorting the head among the Aymaras. (Vol. I, pp. 67, 68.) Old Aymara sculptures showing vertical and antero-posterior flattening. (Vol. I, p. 185.) This work contains many "typical portraits" (I, 103) "taken from life" (I, 518). If correct at all, the Quichuas on the west, and Antis and Chonlaquiro Indians east of the Andes, distort their heads *now*, though Marcy does not say so. (*Vide* pls. Vol. I, pp. 103, 176, 515.)

Torquemada (Book XIV, ch. 25) affirms that permission to shape the heads of their children was a favor granted by the Inca to some nobles, e. g., the artificial contour was that of the royal family. (Spencer, Des. Soc. Ancient Mexicans, Central Americans, etc., p. 28.)

In all these contemporary fac-similes, and in the portrait medallions (Vol. I, pp. 210, 216, sixteenth century) of Incas and Coyas—"The Imperial Tree"—it is noteworthy that, if the delineation is at all accurate, some heads are distorted and some not. It is not possible in this instance to reconcile the portraits with Las Casas' statement that after the fourth Inca the custom ceased.

Ulloa, Juan and Antonio de. (Voyage to South America. London, 1807. 8vo.) Among the Quito Indians, "their beds consist of two or three sheepskins, without pillows or anything else." (Vol. I, pp. 408, 409.) Children are carried on the mothers' shoulders. (Vol. I, p. 409.)

Miers, J. (Travels in Chili and La Plata. London, 1826. 8vo.) The Pampa Indians "never walk any distance . . . some use saddles, but not all; . . . they are ill made." (Vol. I, pp. 256, 257.) Dr. Leighton says of the "horse" Indians of Chili, that "their legs are generally bandy." (Vol. II, p. 473.)

Among the Indians of Chili, "the child is slung in a kind of basket, formed of a wooden hoop having a net-work stretched across it; it is hung by thongs to the roof of the hut." (Vol. II, p. 162.)

De La Condamine. (Relation Abrégée d'un Voyage, etc. Maestricht, 1778. 12mo.) Derivation of the tribal names, Omaguas and Camberas, from the custom of flattening the head; notice of the process (p. 70). *Vide* Porto-Seguro, Historia Geral do Brazil. Vol. I, pp. 18, 19.

Porto-Seguro. (Historia Geral do Brazil. Rio de Janeiro, 1878. 8vo. Vol. I. Head-Flattening.) Etymological remarks on the derivation of the name of certain Tupi (Guaranic) tribes, from what appears to be antero-posterior compression. "Parecidas a mitras de bispos." (Vol. I, pp. 18, 19.)

Southey remarks (History of Brazil. London, 1819. 4to. Vol. III, p. 703) that when Ribeiro encountered the remains of the Omagua at Olivença in 1774, "they had left off the apparatus for flattening the foreheads and elongating the heads of their infants; still they admired the old standard of beauty so much that they moulded them by hand; but the custom is now wholly disused." In Note 32, Vol. III, p. 896, he adds that "several tribes of the Rio Negro flattened their heads like the Omaguas." Humboldt (Political Essay on New Spain. London, 1814. 8vo. Vol. I, p. 154) says, "the barbarous custom . . . of pressing the heads of children between two boards" in South America, "was, like the Greek exaggeration of the facial angle, the Kalmuck nose, the Hottentot lips, an attempt to conform to an ideal of beauty."

Spix and Martius. (Travels in Brazil. London, 1821. 8vo.) It is stated that the women of the Campos of East Brazil "carry their children about on their backs," and from the context, as well as the fact that the sleeping cradle is a hammock, it seems probable that they are carried in a sling. (Vol. II, p. 217.)

Brown and Lidstone. (Fifteen Thousand Miles on the Amazon, etc. London, 1878. 8vo.) They mention another exception to the use of the hammock. The Pamay Indians, on the Rio Negro, "have not the peculiarity of using hammocks, but sleep on the floor of their tents" on "mats of plaited palm leaves" (p. 433).

Heriot, G. (Travels Through the Canadas. London, 1807. 4to.) "The Brazilians, and several other nations in South America," plunge the new-born infant into water. It is then "swaddled to little boards lined with cotton, and more frequently with moss" (p. 343).

In connection with references to nose-flattening as a custom among Brazilian and other South American Indians, the following indicates both the variability of the facial type and that of the standard to which nasal contour conforms when artificially modified. De Moussy, V. M. (Description, etc. de la Confédération Argentine. Paris, 1860. 8vo.) quotes d'Orbigny's *L'homme américain*, etc., to the effect that in the Peruvian branch of the Ando-Peruvian race the nose is long and high—"nez long, très-aquilin." In the Andian branch of same race it varies—"nez variable." In the Aracama branch of same race it is "très court." The Pampean branch of the Pampean race have the "nez très-court, très-épaté, à narines larges, ouvertes." Among the Chiquitean branch of this race the nose is "court, un peu épaté." In the third or Moscan branch of the Pampean race it is "court, peu large." Among the Guaranic tribes of the Brazilian-Guaranian race, the feature is described as "nez court, étroit, narines étroites." Length is a natural characteristic; the rest may be natural or artificial, but no doubt are largely modifications. *Vide* references, *passim*. (Vol. II, pp. 115-117; note.)

Dobrizhoffer, M. (An Account of the Abipones. London, 1822. 8vo.) Father Dobrizhoffer was in Paraguay from 1749 to 1767, and his ethnological matter is ex-

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ceptionally valuable. Of a certain tribe at Mbaovera he says: "The mothers put their babies in wicker baskets, and carry them on their shoulders." (Vol. 1, p. 62.) This is the first notice of any cradle but a sling in this region.

Dobrizhoffer, M. (An Account of the Abipones, London, 1822, 8vo.) The mounted tribes—Indios bravos—of Paraguay "do not use stirrups, and most of them are unfurnished with saddles, even." This fact accounts for the excessive curvature of the legs noticed in previous references. (Vol. 1, p. 236.)

Dobrizhoffer remarks of the Abipones of Chaco, also "an equestrian people," but who are provided with saddles, though "stirrups are not in general use," that "you never see an Abipone with \* \* \* bandy legs." Like the Kirghiz, all these Indians ride more than they walk, and are placed on horseback at the earliest age. Father Dobrizhoffer's statement is not in accordance with the facts of common observation in this regard; but, taken with some reservation, the greater symmetry of limb among the tribes of Chaco is evidently due to the difference of position involved in the use of a saddle. (Vol. II, p. 113.)

King, Col. J. A. (Twenty-four Years in the Argentine Republic, London, 1846, 8vo.) The Chirivione Indians of Gran-Chaco would not eat mutton for fear "their noses would become flat" (p. 169).

Parrish, Sir W. (Buenos Ayres, London, 1852, 8vo.) Speaking of the Pelmenches—"Pine Trees"—a Pampa branch, he says: "I have seen some of these Indians who, from being so constantly on horseback, had become bow-legged to such an extent of deformity that the soles of their feet were turned inward, etc." (p. 173.) This points to the absence of a saddle, such as used, at least, by their congeners, the Tehuelches-Patagonians.

Harris, J. (Navigantium atque Itinerantium Bibliotheca, London, 1741, Folio.) Sebald de Weert speaks of the "crooked legs" of a certain Indian woman found in the Straits of Magellan. (Vol. 1, p. 12.) From what is said afterwards (*Idem*, p. 13) this was evidently a Fuegian.

There are several references to the distortion of limbs among the Fuegians, and to its cause. As an example of the uncertainty attaching to reports of the early voyagers, Harris', Navigantium, etc., quotes Jacques le Hermitte, Voyage of Circumnavigation, 1623, to the effect that the inhabitants of Terra del Fuego were "as fair as any in Europe; \* \* \* very strong and well proportioned, and generally about the height of the people in Europe." (Vol. 1, p. 71.) Of the same kind is Captain Cowley's statement, made from personal observation, that the Hottentots "are born white, but make themselves black with soot." (Harris's Bibliotheca, Vol. 1, p. 83.)

Cook, Captain. (Voyages, etc. London, 1773, 8vo.) Describing the beds of the natives of Terra del Fuego, says that "a little grass \* \* \* served both for bed and chairs." (Vol. II, p. 55.)

## NOTES ON EUROPE.

Rae, Ed. (The White Sea Peninsula, London, 1881, 8vo.) Bowed legs are mentioned as characteristic of the Norwegian Lapps. Not a pure race like those of South Finnmark and Terski Lapland. Distortion probably due to the skin-bag cradle (p. 232).

Laing, S. (Journal of a Residence in Norway, London, 1836, 8vo.) He describes as a characteristic the bowed legs of the Norwegian Lapps. "They form a curve with the leg-bone down to the foot, so that in standing with their feet close together all above is far apart" (p. 247). Pressure in the hood, etc., during infancy probably causes this.

Panofka, T. (Manners and Customs of the Greeks, London, 1839, 4to.) Description of the *Akron*, or wicker, shoe-shaped swinging cradle of Greece (Pl. II).

Gnül and Kauer. (Life of the Greeks and Romans, London, —, 8vo.) "The antique cradle," i. e., the *Akron* of the Hæroic age, "consisted of a flat swing of basket-work." The child, enveloped in the *σπαγγα*, must necessarily have been bound

to this. In the shoe-shaped basket-cradle the infant occupied a sitting position (*vide pl.*, p. 195). The last-named cradle had handles, by which it could be carried or swung. Subsequently, when communication with Asia was constant, other forms of the cradle came into use, "cradles similar to our own modern ones" (pp. 195, 196). The *σταγύρια*, used everywhere in Greece, except in Sparta, were designed to prevent distortion. Besides the swaddling-clothes, however, there was in common use a sufficient variety of bed-clothes to make any kind of resting place for the child soft enough to insure safety against pressure, viz, the *κλίνη* of Homer was covered with hides (*σώα*), and over this lay the *βήρυξ*, blankets or mattress, perhaps. At all events, the later *κρηβέτιον* was a sack of some kind of stuff filled with feathers, pecked wool, etc., and was laid across the straps of the *δένδρα*, or folding bed (*cot*). There were also linen sheets, the blankets before mentioned, and some kind of a heavier covering, presumably of wool, since it was rough on both sides—*πικροπρόματα*, *πικροματρία*, etc.—together with stuffed pillows and bolsters.

Professor Becker (Charles, London, 1880; *Excursus*, pp. 221, 222) gives much the same account of the Greek bed and bedding as Gahl and Komer, *Life of the Greeks and Romans* (p. 136, *et seq.*). Cradles, he says, are first mentioned by Plutarch. "Plato knew nothing of them." No author of his age can be said to have mentioned "a regular cradle." Mothers probably carried their children in their arms, and these "were not encouraged to walk very early." Wet-nurses were commonly employed, and among these the Spartan women were the most famous.

Potter, Dr. J. (*Archæologia Græca*. New York, 1825. 8vo.) It appears that observation had taught the Greeks the effects of pressure on immature bones, since everywhere, except in Sparta, where the end was otherwise secured, the infant was wrapped "in swaddling-bands . . . lest its limbs . . . should happen to be distorted" (p. 628).

De Perthes, B. (*Voyage en Russie*. Paris, 1859. 12mo.) Remarks on nose-flattening in Asiatic Russia, and probable cause of the custom (p. 288).

Burton and Drake. (*Unexplored Syria*. London, 1872. 8vo.) Cranium said to be Turanian, exhibiting "unilateral flattening . . . from use of the suckling-board." (Appendix, vol. II, p. 277.)

Burton and Drake. (*Unexplored Syria*. London, 1872. 8vo. Vol. II, Appendix.) Distortion of cranial contour referred to "custom of swathing the child's head tightly after birth" (*vide* Foville on the process). This distortion of the *calvaria* was in the case of a Semitic (probably Jewish) skull (p. 316), (*ibid.*, Appendix, vol. II). Specimen of brachycephalous Greco-Roman cranium, exhibiting asymmetrical parietal and supra-occipital flattening, partially due to "suckling-board" (pp. 356, 357).

Seeholm, H. (*Siberia in Asia*, London, 1882. 8vo.) describes an Ost'-yak cradle as "a wooden box, about 3 inches deep, with rounded ends, almost the shape of the child." The oval bottom covered with sawdust. Infant wrapped in dannel and furs, and lashed in the cradle. The child is nursed while in this position (pp. 62, 63).

Prichard, J. C. (*Researches into the Physical History of Mankind*. London, 1841, 4th ed. 8vo.) He quotes Pallas to the effect that the only deformity visible among Kabanks is "an outward bending of the arms and legs, resulting from the practice of causing children to rest in their cradles on a kind of saddle" (vol. I, p. 263).

Prejvalsky, Col. N. (*Mongolia*. London, 1876. 8vo. Vol. I.) Chapter II, page 17 *et seq.*, "is especially devoted to the ethnology of Mongolia." He says of the Mongol, "his legs are bowed by constant equestrianism;" but nothing of any form of cradle, or mode of carrying infants, or of malformations other than the above, is said anywhere.

In Pampelly's *Across America and Asia*, La Farge (p. 199) has given fac-similes of wood-cuts representing various deformities of the head, evidently artificial. Japanese art, and especially genre art, is of a high order, not relatively, but positively, and as it can not be supposed that such should be the case without a knowledge of

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the fact that all caricature depends for its effect upon an exaggeration of well-known characteristics to the degree of grotesqueness, it would be well to inquire if now or formerly any custom, etc., justified these contours.

From Dr. W. W. Rockhill the information is received that in China and Mongolia children are carried in the same way as described by Mr. Akabané in Japan, except that the crossed hands to secure the child on the mother's back are not made use of. Capt. John G. Bourke, U. S. Army, states that the Navajos use a cradle-board similar to that described by Major Powell on the Colorado, viz, a buckskin sack fastened to a board, into which the infant is put without being swathed. No cradles are used by the Japanese, Chinese, or in Mongolia.

## NOTES ON ASIA.

The Emperor of China, Kien-hing (1736-1796), in his work *Mandchou-yuen-hion-kas*, says: "The ancient Mandchou some days after the birth of a child prepared for it a little hard bed, and laid it thereon face up. Little by little the back of the head was flattened and became larger. The Chinese have a custom opposite to this. They lay the new born upon its side, first right, then left, wherefore the head is made narrower." This would make the Mandchou brachycephals and the Chinese dolichocephals.

Busk, George (Jour. Anthropol. Inst. Great Britain and Ireland, Nov., 1878, "Notes on a skull termed Nabathean") says that regarding the norma lateralis, its outlines "almost suggest that the skull has been constricted by a bandage."

Spencer, H. (Descriptive Sociology, N. Y. Asiatic Races among the Nomadic Arabs.) "Noble families used to alter the shape of children's heads." (Table XXXI.) This was done in the age of Abou-Zeyd. (Bastian, Mensch, II, 229. *Ill.*, p. 21.)

Vambéry, A. (Sketches of Central Asia. London, 1868. 8vo.) The Turkoman head is "proportionally small" and oblong. This form "is ascribed to the circumstance" that infants are not cradled, but "placed . . . in a swing made of linen cloth" (p. 296). The Turcomans commonly have "their feet bent inwardly; probably the consequence of their continually riding on horseback" (p. 296).

Pallas. (I, 97, *Ussaq*.) The Kalmycks "are well made . . . with the exception of the legs, which are generally bent (a 'sing from being so much on horseback), and slender, like the arms." (Spencer, Des. Sociol. Asiatic Races, p. 3.)

Featherman, A. (Social History of the Races of Mankind, 2d division. London, 1887. 8vo.) The women among the Néasesa, "who are accustomed to bear heavy burdens, have their knees turned inward, and their hips are more or less deformed" (p. 347).

Featherman, A. (Social History of the Races of Mankind, 2d division. London, 1887. 8vo.) Among the Nicobar Islanders "the skull is depressed by art" (p. 239). "A block of wood answers the purpose of a pillow" (p. 240).

Langsdorf, G. H. von (Voyages and Travels, London, 1813. 4to) describes the Ainos (Japan) as having "compressed noses" (vol. I, p. 328). He says the same of the people of Onalashka (vol. II, p. 31). It is not stated that this peculiarity is produced by artificial means. In this, as in a great number of other instances, nothing is said of the appliances used; but the inference is that such must have existed in the case of infants. The following information, communicated by Mr. Shiro Akabané, secretary of the Japanese legation at Washington, exhibits a very simple mode of carrying infants on the back. No cradles of any kind are used in Japan. The child is never bandaged. It is wrapped loosely in a cloth of some kind, and placed on a soft mattress on the floor. There it remains, except when nursed, until it is old enough to clasp the body of its parent with its legs, when it is placed on the back beneath the outer garment, and supported by two bands passing over its back like cross-belts.

History of Kamitchatka (translated and abridged from official Russian account, based on all voyages and travels to Kamitchatka and Kurile Islands, by Dr. James Grieve, Gloucester, 1764. 4to). The Koreki (Koriaks) "use neither cradle nor swaddling-cloths." No mention of any kind of bodily malformation (p. 233).

As Grieco says he only mentions facts concerning the Koriaks and Kurile Islanders, which are *not* true of Kamtchatkales, it may be true that in Kamtchatka and the Kuriles cradles *are* used.

Both among the Ainos and Tartars, Rollin's descriptions point to distortions. The following are his cranial measurements in Saghalien and at the Baie de Castrics: Island of Tchoka (Saghalien), circumference of head, 1 foot, 10 inches, 4 lines; long diameter, 9 inches, 8 lines; short diameter, 5 inches, 8 lines. Baie de Castrics, circumference of head, 1 foot, 9 inches, 4 lines; long diameter, 9 inches; short diameter, 5 inches, 4 lines.

Bush, R. J. (Reindeer, Dogs, and Snow-Shoes. N. Y., 1871. 8vo.) In October Bush saw among the Gilaks, on the Amoor, "a babe tightly banded in a wooden box or cradle, something like that used by our American Indians, but with its legs from the knee downwards unfettered." This cradle was hung vertically to the "ridge-pole" of a "lean-to" shelter, and the child's feet touching the ground, it "swung itself" (p. 123). In northeast Siberia in January, Bush saw "two little boys," belonging to the nomad Tungusians, "lashed together and thrown over a pack-saddle, the one balancing the other. \* \* \* They were each sewed up in single garment \* \* \* made of heavy reindeer fur." Only the eyes and nose were visible (pp. 210, 211).

A. E. Nordenskiöld (Voyage of the Vega, London, 1881, 8vo, Vol. II) describes "a wide skin covering with the legs and arms sewed together downwards" as the substitute for the cradle among the Chukchis. Similar devices used by most polar tribes apparently. No visible cause for distortion (p. 102).

#### NOTES ON AFRICA.

Wood, J. G. (Uncivilized Races of Men. Hartford, 1871. 8vo.) The Abyssinian midwives mold the features of infants "to make them handsome" (p. 458).

Wood, J. G. (Uncivilized Races of Men. Hartford, 1871. 8vo.) Among the Fans the child is carried astride of a bark belt (p. 530). The "paingkoot" or circular mat cloak of Australians serves to carry the child, vertically placed. The Australian form is exceptionally fine (p. 609). The cradle of the New Zealand infant is a mat wrap (p. 817). In New Guinea the child lies "in a sort of sling" of leaves or bark, and is so carried (p. 901).

Alexander, Captain (Jour. Royal Geogr. Soc., London, 1835, Vol. V, p. 318, note) says of the Fingoes (or Wanderers) of South Africa, that their "children are carried behind wrapped in the kaross."

Little, H. (Madagascar. Edinburgh and London, 1881. 12mo.) The Magalasy "mother carries her infant upon her back, and not in her arms" (p. 64). No description of the means used to support the child.

On page 193 of M. C. Buet's Madagascar la Reine des Isles Africaines, there is a plate of a woman carrying a child, placed in a sort of hood formed of a fold of the outer garment, which may explain Little's statement.

Wilkinson, Sir J. G. (Manners and Customs of the Ancient Egyptians, New York, 1879) states that the head-rest, or according to Porphyry "a half-cylinder of wood in lieu of a pillow," was in general use in Egypt. (Vol. I, pp. 185, 186.)

Wilkinson adds that the same kind of a pillow is found in China, Japan, and among the Ashantees and Kaffirs. This is a very incomplete statement of the peoples who use the head-rest; but there is a slight incongruity between his assertion of the universal use of this kind of pillow, and that made (Vol. I, p. 417) to the effect that the Egyptians commonly slept on couches, because many of those depicted in his plates would not have permitted the head-rest to be used on account of their form. He says also that the Egyptian bed was often a skin placed on the ground or a frame of palm wicker-work like the modern *caress*, and in these cases a wooden pillow, cushioned as in Japan and China, for the rich, might have been employed.

The Madi women carry their infants in skins which have been dried in the sun and scraped clean and smooth with a stone and softened with butter. The skins of

goats, gazelles, spread over the mother's with its head bel the sun. When (1831-81, p. 325.)

Forbes, H. O. (1855. 8vo.) In "spathe," which is one sleeps on a b piece of square

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goats, gazelles, sheep, and calves are used, the legs being tied together and strung over the mother's shoulders. The baby is placed in the skin under the woman's arm, with its head behind. Sometimes a gourd is placed over the head to protect it from the sun. When older, the child is carried on the arm. (Proc. Roy. Soc., Edinburgh, 1854-54, p. 325.)

## NOTES ON OCEANICA.

Forbes, H. O. (A Naturalist's Wanderings in the Eastern Archipelago. New York, 1875. 8vo.) In Timor-Laut, infants are laid "quite naked . . . on a hard palm spathe," which is spread in a sawela or "rough rattan basket" (pp. 345, 346). Every one sleeps on a banquette covered with bamboo mats, and they "rest their heads on a piece of squared bamboo with rounded edges" (p. 348).

Dr. J. G. Garson (Appendix to Part IV, p. 343), describing the Timor-Laut crania procured by Forbes, remarks that "all the brachycephalic skulls . . . exhibit more or less flattening in the occipital and parieto-occipital region, such as would be produced by laying an infant, without any soft material under its head, in a cradle like that described." Owing to race intermixture there are two types of cranial contour in Timor-Laut; but it is evident that the same conditions must be operative whether the head is short or long. The difference is one of degree, not of kind. Dr. Garson observes also that "the height of the skulls is in all instances less than the breadth," a fact which (although not mentioned as such) is of the same class as that of occipital flattening, and apparently due to the same cause, viz. the weight of a head incompletely ossified resting on an unyielding surface, and in which restitution during growth is prevented by the subsequent use of a wooden pillow. An isolated fact, and of course having only that value in this connection, is stated by Major Cambell (Geographical Memoir of Melville Island, north coast of Australia, in Jour. Royal Geogr. Soc. London, 1831, Vol. IV). He says that the pillows he saw were made of "pieces of soft silky bark, rolled up in several folds" (p. 157), and also that their cranial characteristic is that "the back of the head projects very much" (p. 153). . . . The aborigines of Melville and Bathurst Islands are of the same race . . . as those throughout New Holland (p. 158). Hard or wooden pillows are not universal in warm countries. The Ovals of Madagascar sit on cushions, lie on mats, and have a matted bolster." (Jour. Roy. Geogr. Soc., 1835, Vol. V, p. 332; Captain Lewis.)

Flower, William H. (Fashion in Deformity. Humboldt Library, New York. Vol. II, No. 28.) The author reports a statement made to himself by Mr. H. B. Law, to the effect that the Dyaks of Arawak practiced artificial flattening of the occiput (p. 12).

Featherman, A. (Social History of the Races of Mankind. 2d division. London, 1887. 8vo.) Among the Dyaks a mat like the Mexican petate, which serves the same purpose, is used for a bed. "A bag stuffed with grass answers the purpose of a pillow" (p. 258).

Reynolds, J. H. (voyage of the U. S. frigate *Potomac*, New York, 1835, 8vo) states that the heads of the Achenese "are somewhat flat or compressed," but gives no reason for this (p. 183).

Guillemeard, Dr. F. H. H. (Cruise of the *Marchesa*, London, 1876. 8vo.) In the Sulu Archipelago the cradle used is a "little basket-woven cot" hung in the middle of a long bamboo supported at the ends. The vibrations of the bamboo when pulled rock the child. (Vol. II, p. 14.) Among the Hatam Papuans he saw a number of women "with babies strapped upon their backs." (Vol. II, p. 291.)

Featherman, A. (Social History of the Races of Mankind. 2d division. London, 1887. 8vo.) Among the Sumatras "the nose is flattened and the skull is compressed from early infancy as a mark of beauty" (p. 289).

Marsden (p. 44). "The Sumatrans flatten the noses, and compress the noses of children newly born. They likewise pull out the ears of infants to make them stand



at an angle from the head." (Spencer, Des. Soc. Negritto and Malayo-Polynesian Races, pp. 20.)

Featherman, A. (Social History of the Races of Mankind. London, 1887. 8vo.) Among the Melville Island tribes "a roll of thin, silky bark serves as a pillow at night and as a seat in the day-time." (Papuo-Melanesians, 2d divis., p. 120.)

Featherman, A. (Social History of the Races of Mankind. London, 1887. 8vo.) The aboriginal Tasmanian women (Papuan) "throw over their shoulders the skin of an untanned kangaroo or opossum," in which they place their children "when carrying them on the back." (Papuo and Malayo Melanesians, 2d divis., p. 100.)

Cook, Captain. (Voyage towards the South Pole, etc., II, p. 31.) Natives of Mallicollo wear a belt which "they tie so tight over the belly that the shape of their bodies is not unlike that of an overgrown pismire." (Spencer, Des. Soc. Negritto and Malayo-Polynesian Races, p. 20.)

Busk, George (Jour. Anthropol. Inst. Great Britain and Ireland, Jan., 1877) speaks of the "extreme flattening . . . of the frontal region" in certain Mallicollo skulls as "artificial."

Cheever, H. T. "The unnatural flattening of the occiput" (in the Hawaiian head) "is thought to be owing to the way the mother holds her babe, which is by the left hand supporting the back of its head." (Spencer, Des. Soc. Negritto and Malayo-Polynesian Races; pp. 20, 21.) Occipital flattening also promoted by the use of a mat pillow or one of wood.

D'Albertis, L. M. (New Guinea. London, 1881. 8vo.) On Yule Island "children were carried . . . in netted bags, resting on the backs of their mothers, suspended by a cord that passed round the women's heads. . . . Their legs were small in proportion to their bodies." (Vol. I, p. 262.) Both on the coast and in the interior of Yule Island the natives wear a tight, broad belt, "sometimes woven on the body." Compression from this results in distortion, giving the figure a "very peculiar appearance." (Vol. II, p. 362.)

Featherman, A. (Social History of the Races of Mankind. London, 1887. 8vo.) State that the Riara women (Papuo-Melanesian group) carry their children "on their backs in a bag of net-work . . . suspended from the forehead by a band" (p. 51). Other Papuan carry their infants in the "flap" of a cloak made of cocoa-nut fiber (p. 21). The Tasmanians carried them "wrapped in a kangaroo-skin, which hung behind the back" (p. 21).

United States Exploring Expedition (Wilkes). (4to. Vol. VI. "Ethnography." Horatio Hale. Philadelphia, 1846.) General remarks on prevalent occipital flattening among Polynesians (p. 10).

In connection with the references to occipital flattening among the Polynesians (a fact variously explained), but not in any case, so far, referred to the general custom of laying infants on hard mats in warm countries, and especially so in Oceania, thus undesignedly compressing the head by its own weight, the following statements are made: Sir J. Bowring (Philippine Islands, London, 1859, 8vo) quotes the ethnological tables of Buzeta to the effect that the "pure Indians" (Tagals) of the Philippines have this characteristic, whereas among the Mestizos and Negritos it is not mentioned (p. 176). Wood (Uncivilized Races of Men; Hartford, 1871; 8vo) states that in *childhood* the Bushman skull exhibits excessive occipital projection, and this naturally (p. 249). Further, that the same is the case with the Ovambo at all ages (p. 316). Finally, that marked convexity of the front as well as the back head distinguishes the Wahuma (p. 100). These facts, *by themselves*, cancel any inferences from the exceptional contour of a *single* cranial bone unsupported by evidence of abnormal growth or mechanical interference. Hard mats and a wooden pillow explain the fact of occipital flattening, where a vertical occiput is not a decided race feature.

Wallace, A. R. (Australasia, London, 1879, 12mo) quotes Captain Erskine to the effect that among the Polynesian or Mahori race it is the custom to flatten the nose during infancy (p. 493). He remarks that the occipital flattening may be artificial

(p. 494). Through notices of disfigurement of Vanitoro, San elevated by circular Pritchard W. describing the procedure have the custom of flattening the forehead with the fingers (pp. 127, 128).

Martin, Dr. J. (8vo) On Yule (the mothers, sus 202.)

Buller, J. (Fetters-dattening)

Foster, Dr. J. (1778, 4to). Notice of the People of Tierra and the toes (pp. 503, 504).

Foster describes the procedure of the general de las I.

Turnbull, John (of the Otafany" (p. 341).

Ellis, William (of "fancy" in the and were generally in bandages or wraps and its features spread out the nose of beauty." (Vol. I, p. 343.)

In general reference, Caroline, stature," but the in mountainous from using the "the facial angle is not so gentle or aquiline," chiefs have no

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Dr. Karl Schou (1820). Remarks on America (*ibid.*, Wood, J. G.

ing and nose-flattening. United States treated.

(p. 494). Throughout this work and the ethnological appendix by Keane, there are no notices of distortion other than the above. On page 476 is a portrait of a "chief of Vanitono, Santa Cruz Islands," whose skull appears to have been compressed and elevated by circular bandages.

Pritchard W. T. (*Polynesian Reminiscences*, London, 1866, 8vo.) Without describing the process, he states the fact that the Tongans, Samoans, and Fiji Islanders have the custom "of squeezing the heads of infants into \* \* \* a shape in conformity with their ideal of beauty" (p. 417). Remarks on contour of distorted skull (pp. 127, 128).

Martin, Dr. J. (*An Account of the Natives of the Tonga Islands*, London, 1818, 8vo.) On Yule Island "children were carried in netted bags, resting on the backs of the mothers, suspended by a cord that passed round the women's heads." (Vol. 1, p. 202.)

Buller, J. (*Forty Years in New Zealand*, London, 1878, 12mo.) Description of nose-flattening and modification of shape of limbs by manipulation (pp. 215, 216).

Foster, Dr. J. R. (*Observations made during a Voyage round the World*, London, 1778, 4to.) Notice of antero-posterior depression of skull in Mallicollo (pp. 242, 267, 268). People of Tierra del Fuego, constantly in canoes, have "the legs bent, the knees large, and the toes turned inwards" (pp. 251, 268). Remarks on nose-flattening in Tahiti (pp. 593, 594). Says Hottentots and natives of Macassar have same custom (p. 594).

Foster describes the process of flattening the nose in Tahiti, and quotes his description of the process used by the Hottentots and in Macassar from Gomara, *Historia General de las Indias* (pp. 593, 594).

Turnbull, John (*Voyage Round the World*, London, 1813, 8vo) remarks that the noses of the Otahaitians are "universally flat, occasioned by pressure during their infancy" (p. 314). Nothing further said.

Ellis, William. (*Polynesian Researches*, London, 1829, 8vo.) "During the period of infancy" in the Society and Caroline Islands "the children were seldom clothed, and were generally laid or carried in a horizontal position. They were never confined in bandages or wrapped in tight clothing." In Tahiti "the shape of the child's head" and its features were carefully observed, and parents and nurses "often pressed or spread out the nostrils of the females, as a flat nose was considered by them a mark of beauty." (Vol. 1, p. 343.) In Tahiti "the forehead and the back of the head of the boys were pressed upwards, so that the upper part of the skull appeared in the shape of a wedge. This, they said, was done to add to the terror of their aspect." (Vol. 1, p. 343.)

In general remarks on the "South Sea Islanders," *i. e.*, natives of the Georgian, Society, Caroline, "and adjacent isles," Ellis says they "are generally above the middle stature," but their limbs are not correspondingly muscular, though "well formed." In mountainous parts they have inturned feet and an "exceedingly awkward" gait, from using the naked feet in climbing rocks and ravines. Except when distorted, "the facial angle is frequently as perpendicular as in the European." Nose-flattening is not so general as it was formerly, and the nose "is seldom flat," but "rectilinear or aquiline." (Vol. 1, pp. 13-15.) The bed of the majority is a single mat. The chiefs have many. The pillow is wooden. (Vol. 1, p. 67.)

On Carpentaria Gulf, Australia, the mothers flatten the nose of their young children by pressing it with the hand on the point and laying the child on its face.

Dr. Karl Scherzer. (*Voyage of the Novara*, London, 1863, 8vo. Vol. III.) Opinion that artificial flattening of occipital region prevails among women of Tahiti (p. 220). Remarks on artificial distortion of head on west coast of North and South America (*ibid.*, pp. 317, 348, 353).

Wood, J. G. (*Uncivilized Races of Men*, Hartford, 1871, 8vo.) Occipital flattening and nose-flattening among the Tahitians, with description of the process (p. 1059).

United States Exploring Expedition, 1, 339. Method of carrying children illustrated.

Calvert, T. W. and J. (*Fiji and the Fijians*, N. Y., 1859, 8vo.) The bed of a chief made on the banquette, "is covered with mats, varying in number from two to ten and spread over a thick layer of dried grass and elastic ferns, while on them are placed two or three neat wooden or bamboo pillows" (p. 108). There was an elaborate form of general bed. An infant is "anointed with oil and tumeric," but apparently not swathed in any way. The friends "plait small mats, measuring about feet by 1, for the mother to nurse her babe upon." There is no notice that its bed is not like that described above (p. 138). "Natives nurse the child sitting quite naked astride the mother's hip, where it is kept from falling by her arm" (p. 139).

The Calverts also describe the nose as "well shaped, with full nostrils, yet distinct from the negro type." The "lower extremities" are "of the proportion generally found among white people." The "mold of the body is decidedly European" (p. 82). Dr. Pickering (*Races of Men*, p. 117) says the Fijian crania are unique, have "rather the negro outline," while "the profile" appears to be "as vertical, if not more so, than in the white race."

Nind, S. (*Jour. Royal Geogr. Soc. London*, 1832, 8vo, Vol. 1.) Describing natives of King George's Sound (Swan River colony), in Australia, he says: "For the first few weeks the child is carried on the left arm in a fold of the cloak, but subsequently is suspended on the shoulders" (p. 30).

Foville, A. (*Influence des Vêtements sur nos Organes*, etc., Paris, 1834), describes cases of cranial deformity and mental incapacity produced by bandaging the head during infancy.

Foville quotes Blumenbach (*Collectio Craniorum*) with reference to cases of antero-posterior flattening accompanied by occipital protrusion, and to instances of the pyramidal form of the Peruvian skull. He states that Turkish crania grooved by ligatures have been found.

M. Viréy (*Art. "Enfant," Dic. des Sci. Méd.*) asserts that caps drawn tight by ribbons will "force the head into a sugar-loaf shape, and produce idiocy" in infants.

La Bret. (*Compt. Rend. Soc. de Biologie*, Paris, 1852, 1v, *et seq.*) Sur la déformation artificielle du crâne en Amérique. The author gives a résumé of the opinions of well-known writers on the production of cranial deformity by artificial means in North and South America.

Gueniot (*Bull. Soc. de Chir. de Paris*, 1870, 2d Ser., x, 382 *et seq.*), "Obliquité par propulsion unilatérale," describes a case of flattening of the occipito-parietal region on one side, accompanied by corresponding projection of the other, due to constant position of the head on a hard surface during infancy.

Dr. J. Thurman (*On Synostosis of the Cranial Bones*, London, 1865), describes a brachycephalous skull from the Round Barrows, with a broad, shallow depression passing behind the coronal suture and over the occiput in the line of the transverse spine. This was evidently the effect of some kind of head-dress; probably, one such as MM. Foville and Lunier has described as now in use in France.

L. A. Gosse (*Essai sur les déformations artificielles du crâne*, Paris, 1855, Ackermann. Neues Magazin von Baldringer, Bd. 2, p. 5), says, "Hinc morem in Germania satis usitatum esse et Laurenberg; etiam Hamburgensis capita neonatorum vinctis artificiose compressisse." Schade, J. *De Singulari crani ejusdem deformitate, tryphiae*, 1858, 11."

*Idem* Lunier (*Essai sur les déformations artificielles du crâne*, Gosse, Paris, 1865), refers to this custom as prevailing — the Franco-Gallic "toyines, and adds, "Hanc hanc dicitur de intellectu videtur, totum etiam hujus crani deformitatem ea causa affectam esse." 11.

*Idem*, Andry (Gosse's *essai*) reports the same in Flanders. Shadel recognizes the intra-uterine causes, and for the most part occupies himself with distortion due to affections of the sutures, following Hyrtl, Stahl, and Virchow.

Case of what Guéniot calls *Obliquité par propulsion unilatérale*, "reported by M. Moequet. (*Bull. Soc. Anat. de Paris*, 1875, 1, 56.) Cause stated to be in all such cases,

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Bourke, Capt. John G. (*Snake-Dance of the Moquis, New York, 1884*), describes "cradles of flat boards, with a semi-circular screen for the head. These differ among the Moquis in no essential from the ordinary cradle-board of the North American Indians. When the child is placed on it it is wrapped up tightly in blankets, with its arms pinioned (tightly to its sides)" (pp. 219, 211).

Vambéry, A. (*Sketches of Central Asia, London, 1868*). Swaddling clothes are here in general use, and the kindik kesen, or cutter of the same, is a person of much consequence, because the act of cutting these out is accompanied by many ceremonial observances. Vambéry seems to indicate, however, that the child is not swathed for any length of time.

Harris, Maj. W. C. (*Highlands of Ethiopia, London, 1841*). The beux of the Dankalls and Somalis, at Tajura, "employ in lieu of a pillow a small wooden bolster, shaped like a crutch-handle, which receives the neck . . . and preserves the periwig from derangement" (1, p. 58).

D'Alberis, L. M. (*New Guinea*). "Great varieties of type, in color, physiognomy, and in the shape of the skull," are found on Pangiani Island. Here it is observed that parietal compression protrudes the supra-orbital arches (1, p. 29). The same statements may, he says, be made of the natives at Orangerie Bay (1, p. 37). Along the whole line, from Sorong to Dorey, the nose varied in form from flat to aquiline (1, p. 210). In his plate of the mummified head got from Darnley Island, Torres Straits, the type is microcephalous.

Blake, Dr. Carter (*Appendix Unexplored Syria, Burton & Drake, London, 1872*), describes a female skull from the Dayr Mir Musa el Habashi showing artificial "compression of the parietal bones," probably caused by use of the "suckling-board."

Davis. (*Collection of Voyages and Travels, etc., London, 1710*). "In Morria, a small, low island, lying in the river of the Amazons," children are thus carried: "They take a piece of the rind of a tree, and with one end thereof they fasten the child's head, and about the arms-pits and shoulders with the other, and so hang it on their backs like a tinker's budget" (1, p. 157).

Dawkins, W. Boyd. (*Cave Hunting, London, 1871*). Refers to Professor Busk's notes on the crania of Perthi-Chwaren, in which a skull with "a well marked depression across the middle of the occipital bone" is described. This depression had the appearance of being "caused by the constriction of a bandage." Except this deformation the skull was "well formed and symmetrical," not having any of the contours of the *ête annulaire*, due, according to MM. Foville and Gasse, to occipital compression (p. 170).

Professor Busk states, in his ethnological notes (*Cave Hunting*), that the Berber contingent of the Moorish invaders of Europe in the eighth, ninth, and tenth centuries "used to elongate the skull posteriorly and flatten the head" (pp. 170, 171).

In the same work Professor Dawkins suggests that the flattened occiput of the brachycephalous invaders of neolithic Britain "may have been caused by the use of an unyielding cradle-board or intanex" (p. 193). Evidently the flattened vertex of the Seliigneux cave was not natural (p. 213).

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