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WITH FURTHER DATA ON THE VERO SKULL

(With Eight Plates)

BY
T. D. STEWART
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(Publication 3854)

CITY OF WASHINGTON
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INTRODUCTION

The Christmas scientific meetings held in New Haven in 1925 were enlivened by a session of the Paleontological Society at which J. W. Gidley exhibited a crushed human skull from Melbourne, Fla., which, he suggested, had been stepped on by a mastodon or mammoth. Ordinarily the paleontologists might not have been excited by Gidley's offering and its implication of human antiquity on this continent. However, news of his scheduled paper had reached the American Anthropological Association, meeting several blocks away, and this body, led by that veteran antagonist of the antiquity of man in America, Aleš Hrdlička, came en masse to hear the debate. This increased attendance, besides showing the general interest in the subject, also gave emphasis to its controversial nature.

The anthropologists, or at least the more vocal of them, were intent on defending the generalization, more widely held at that time than now, that man first came to this continent in recent times. The paleontologists, on the other hand, were defending basic concepts of their science; namely, that the faunal inclusions in a stratum when found undisturbed and not redeposited are indicative of the relative age of the stratum, and also that such faunal associations represent in themselves contemporaneity of existence.

In the tense atmosphere engendered by these different viewpoints, the session proceeded with rather more dignity than some had anticipated.[1] Gidley somewhat reduced the controversial issue by sug-

[1] The secretary of the Paleontological Society reported the event thus: "At 2 p.m. the Society convened and had as its guests visiting archeologists and ethnologists to hear the geological evidence for fossil man in Florida.

"A spirited discussion followed Dr. Gidley's presentation, which was illustrated by some of the human remains discovered and by lantern slides. Among the speakers was Dr. Aleš Hrdlička, who made an appeal for closer affiliation between the ethnologists and geologists in studies of ancient man." [P. 239.]

gesting ". . . a relatively recent date, either late Pleistocene or even post-Pleistocene, for the extinction of the last survivors of the Pleistocene fauna in the south" (Gidley, 1926a). In leading the discussion, Hrdlička refused to accept this dating and reasserted some of the arguments he had used against the antiquity of the similar finds of E. H. Sellards at Vero, Fla. (Hrdlička, 1918, pp. 34-38). The essence of these arguments is: (1) that the chances for the accidental inclusion of human remains, especially of more than one individual, in a geological deposit are infinitesimal, and (2) that, judging from Old World finds, "As late as the Aurignacian culture period, approximately 15,000 to 25,000 years ago, man had not yet fully reached modern standards in physical development . . . and cannot possibly be conceived of as having been numerous enough to reach the northeasternmost limits of Asia, from which alone there was a practical way open to the American continent" (p. 37). Since Gidley denied the existence of any evidence pointing to intrusive burial, whereas the anthropologists felt that such evidence could have been overlooked, the debate, needless to say, ended in a draw.

The next year Gidley and Loomis, as co-excavators at Melbourne, both together and separately restated their conclusions:

Gidley:

. . . . there was no difficulty in recognizing over a wide area at Melbourne the three principal geologic horizons designated by Sellards at Vero as Nos. 1, 2 and 3. This made the correlation of the beds of the two localities comparatively easy. It was found that at both localities, all the fossil bones taken from Sellards "No. 2" layer were primarily deposited and were definitely of Pleistocene age. Many of the bones of the lower part of No. 3 were also of this age but were often mixed with bones of more modern species. Also that "No. 3" layer usually lies unconformably upon the somewhat unevenly eroded surface of "No. 2." "No. 3" layer throughout contained numerous evidences of man, apparently of no great antiquity, while no remains of this character were found, in the lower portion at least of "No. 2." However, at Melbourne there were found, at three relatively widely separated areas, human bones or artifacts associated with undisturbed, and not redeposited, fossil bones of the Pleistocene fauna. These finds were all near the top of "No. 2" level, just below the contact plane [see plate 1, A and B]. As no human remains or artifacts were found below the top layer of "No. 2" it is assumed that man arrived in Florida about the close of the time marked by the finished deposition of "No. 2" or during the erosion interval between it and "No. 3" and that he seems to have found there a late survival of the Pleistocene fauna, certain species of which may have persisted in the south later than did their relatives in the north country. [1926b, p. 26.]

Loomis:

While this No. 3 bed was forming, the bones of mastodons and mammoths were included in the material along with both human bones and tools. The whole

question now hangs on when this last filling in took place. The only data which are now available are the bones of the mastodon and mammoth. At first thought one would say it must have been either in late Ice Age or very shortly after the Ice Age. The end of the Ice period is put at 25,000 years ago.

The only possibility of a later date than 15,000 to 20,000 years ago as a minimum, lies in the possibility of these elephants surviving in Florida to a later date than elsewhere. In these beds we are not dealing with a remnant of the elephant fauna. They occur in great numbers. . . . The elephants were flourishing during the time that No. 3 bed was laid down. Much the same is true in other parts of the country. Just before they disappeared they were very abundant, then they were all gone, as though swept off by a pestilence. There is no reason to think they lasted longer in Florida than elsewhere. All this, then, would indicate that man of the Neolithic type of culture was in Florida 20,000 years ago at least. [1926, p. 262.]

Gidley and Loomis:

. . . . it may safely be assumed that man, although of modern type, reached Florida before the total extinction of the mammoths and mastodons. But that this arrival occurred far within Pleistocene time does not seem probable. Mammoths and mastodons are known to have survived in the Great Lakes regions up to the time of the formation of the swamp deposits which followed the last retreat of the glaciers in North America, and it seems not improbable that a considerable remnant of the Pleistocene fauna survived the glacial periods in Florida and other localities of the southern and southwestern United States, and remained there after the great ice sheets had disappeared in the North. However this may be finally concluded, the present evidence as here interpreted seems to indicate quite clearly that the time of man's first appearance in Florida should be placed at a time much earlier than has hitherto been supposed, possibly early post-Pleistocene, and that these people seem to have preceded the Indians who built the mounds characteristic of the east coast of Florida. [1926, pp. 263-264.]

Gidley continued his search for elephants in Florida each year until his death in 1931. In the course of this work, although he found no more ancient human bones, he seems to have fortified his original convictions regarding the natural association of the human and elephant remains and hence their relative antiquity. (See Explorations and Field Work of the Smithsonian Institution for the respective years.)

FIRST RECONSTRUCTION

About 1937 the Melbourne skull and left clavicle were transferred from the Division of Vertebrate Paleontology to the Division of Physical Anthropology in the United States National Museum, where

they bear catalog No. 331,402.[2] At that time, as when exhibited in New Haven, the specimens were still encased in plaster of paris (pl. 2). However, in order to demonstrate the type of the skull, Hrdlička had one of the minor museum preparators undertake its reconstruction. In this process, since many parts were missing, the pieces were applied for stability to a mass of modeling clay (plasticine). The result (pl. 3) was discussed by Hrdlička at the International Symposium on Early Man held in Philadelphia in 1937 and exhibited during the same year at the meeting of the American Association of Physical Anthropologists in Cambridge (Hrdlička, 1937a and b). On both occasions he characterized it as the usual type of the Indian crania found in the mounds of this part of Florida.

Although this about covers the history of the Melbourne skull, note should be made of an important coincidence relating to the year 1925, when this skull was found. This was the year in which the Folsom fossil pit—across the continent in New Mexico—was first reported. Here in 1926 Figgins was to find the first Folsom point associated with an extinct bison. Since then many other chipped blades of this peculiar type have been found in widely scattered localities, especially in the Southwest, and usually under conditions suggesting a relative antiquity (Roberts, 1939). Unfortunately, no human skeletal remains have been found associated with these artifacts. However, the circumstances surrounding their recovery, both geological and paleontological, constitute the best evidence thus far in favor of ancient man in America. As such it gives renewed significance, as J. C. Merriam has pointed out (1935), to the Florida finds of Gidley and Loomis.

It may be noted also in this connection that Sellards, who is well acquainted with these developments in the West, reaffirmed in 1937 his views regarding his Vero finds of 1915-16. As he views the situation after an interval of 20 years,

> The conclusion that is in accord with the observations at Vero, and at many other localities in the western hemisphere, is that man reached this continent before the close of the Pleistocene . . . and participated in the great drama of the extinction of the magnificent mammalian fauna of that period. [P. 210.]

[2] Gidley and Loomis (1926, p. 259) speak of pieces of finger, arm, and leg bones found near the skull. When the present study was almost completed (1946) these parts, along with some other pieces of the skull, were found in Gidley's collection in the Division of Vertebrate Paleontology. These parts also have been given the number 331,402 in the Division of Physical Anthropology. Since these extra parts do not change the conclusions already reached, it has been decided not to recast the report, but rather to add a section at the end (see pp. 24-27). Throughout the text, wherever statements require modification on account of this new material, proper footnotes have been added.

From the above summary it appears that the Melbourne skull, although one of the very few thus far found in America for which such an impressive age is claimed, itself has received only minor attention. Aside from considerations as to its position in the deposits and its flattened condition when found, the sole description by an anthropologist (Hrdlička, 1937a) is contained in one sentence supplemented by three small illustrations. This description reads as follows:

> It is the skull of an Indian male, of advanced adult age, undeformed, brachycranic, high, and in general presenting the ordinary Florida mound Indian type and characters. [P. 98.]

The mound crania from this part of Florida are indeed relatively *broad-* and high-headed (Hrdlička 1940a; see also below). Distributional studies (Stewart, 1940), on the other hand, support the belief that the earliest cranial type on the continent was *long-* and high-headed. What then is the explanation of the rounded form reported by Hrdlička for the Melbourne skull? Is it, in spite of the paleontological evidence, actually as recent as Hrdlička contended? Or were there more than one early type, both long- and round-headed? Or is the reconstruction at fault and the specimen really long-headed?

SECOND RECONSTRUCTION

I have long felt that the crude method used in the original reconstruction of the Melbourne skull was reason enough for reexamining its form. In this version, owing to the solid mass of clay within, only the outer surface of the skull is visible. This makes it difficult to judge whether all fragments are in their proper positions and, where fragments have been united, whether they are tightly joined. The proper union of the fragments is especially important because this mainly determines the form of the total reconstruction. If, as seems to have been the case, the fragments were visually oriented on the surface of the ball of clay, then their relationships depend more upon the size and shape of this ball than upon their proper union. Besides, there are certain morphological details, clearly visible in the illustrations, that cast doubt upon this reconstruction. We shall return to these details later.

I should point out also that thus far the Vero and Melbourne skulls have been studied only by Hrdlička, who definitely was biased on the subject of man's antiquity on this continent. Now that there is more reason to accept the paleontological evidence of man's presence in America during late Pleistocene or early post-Pleistocene times, it seems high time to examine the skulls from this different point of view.

Recently I have detached the fragments of the Melbourne skull from the ball of clay, cleaned them and made a new reconstruction. In this second version the shape of the whole has been determined primarily from the union of the parts. Temporary support for the assembled fragments was gained by the use of wire braces held in place by ambroid. At a later stage when the result was deemed satisfactory, the gaps caused by missing parts were filled in with a commercial "crack filler." Usually this gave sufficient strength so that the braces were no longer needed. Finally, when all the parts that could be joined were in place, certain distinctive parts, such as the temporal bones and zygomatic processes of the frontal bone, which lacked actual contacts, were approximately located. Here also the gaps in the temporal and supraorbital regions were filled in for support. Plate 4 shows the result of this second reconstruction.

It is important to indicate the limitations imposed upon the restorer by the imperfections of the fragments. The better to illustrate these details, stereographic drawings have been made of the new version with the aid of the Schwarz stereograph (fig. 1, A-D). Inspection of figure 1, A, makes it clear that only in the midparietal region is there continuity of bone between the right and left sides. The total length of the preserved part of the sagittal suture, which provides this contact, amounts to 3 cm. Furthermore, along the edges of the suture, only the inner table of the bone is preserved, the outer table being irregularly broken away for distances up to 7 mm. laterally (this detail is also shown in pl. 6). The recovered portions of the two parietals thus join along a thin edge. Accordingly, this joint can be moved like a hinge, narrowing or broadening the skull as a whole. In joining these parts I was guided simply by the fit of the edges and my original joint has not been (although perhaps it should be slightly) modified.

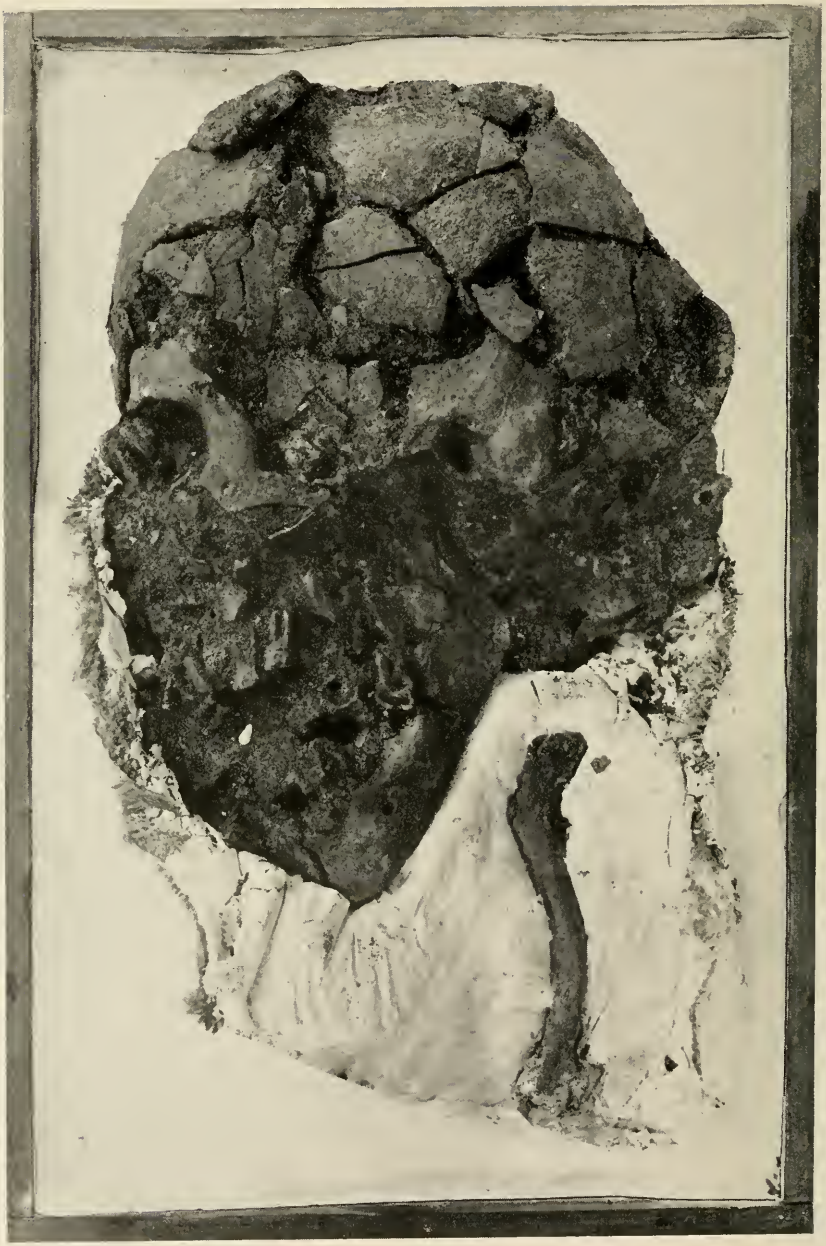
Aside from the sagittal suture the only indication of the midline is preserved in the form of the frontal crest on the inner side of the frontal bone. This crest is a part of the set of fragments making up much of the left side of this bone. Since damage makes the exact alignment of the frontal and parietal bones along the left coronal suture somewhat uncertain, the only solution was to align the frontal crest with the sagittal suture. Along the right side of the coronal suture, where likewise there was considerable damage, the alignment of the fragments could be judged by the pattern of the vascular impressions on the inner surface (pl. 5).

The only other questionable joints occur on the left parietal just above the superior limit of the squamous suture (fig. 1, C). It is

A, view of a drainage canal at Melbourne, Fla., and the excavation near it, in which was found the human skull.

B, the human skull just before it was bandaged. The arrow points to the skull. Above it is No. 3 layer, below is No. 2 layer.

(Captions as given by Loomis, 1926, p. 261.)



The Melbourne skull and left clavicle mounted in plaster of paris as exhibited in 1925. The box seen here as a frame is recalled as being only about 3 inches deep. This indicates the flatness of the crushed specimen. Also, owing to the paleontological technique of removing such specimens, the parts here exposed were originally on the under side as the specimen was discovered. In witness of this fact, note the crepe paper passing under the clavicle and under the skull.

Four views of the Melbourne skull as reconstructed under Hrdlička's direction. Note the roundness of the specimen and the abnormal distance between ear opening and lateral border of the eye. X indicates a misplaced piece of frontal bone. Compare details with the writer's reconstruction shown in plate 4. A cast of the original is shown here oriented as nearly as possible on the Frankfort horizontal. Approximately $\frac{1}{3}$ natural size.

Four views of the writer's reconstruction of the Melbourne skull oriented on the Frankfort horizontal. Note the elongated form and compare with the earlier reconstruction shown in plate 3. These views are interpreted in stereographic drawings (fig. 1, A-D). The posterior part of the left parietal was found and placed in position after these views were made (fig. 6). Approximately $\frac{1}{3}$ natural size.

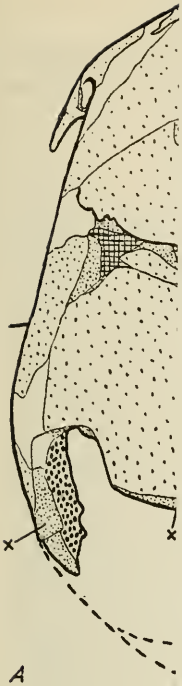


FIG. 1.—Stereogra
(C) norma lateralis
stipple = natural bon
endocranial surface;

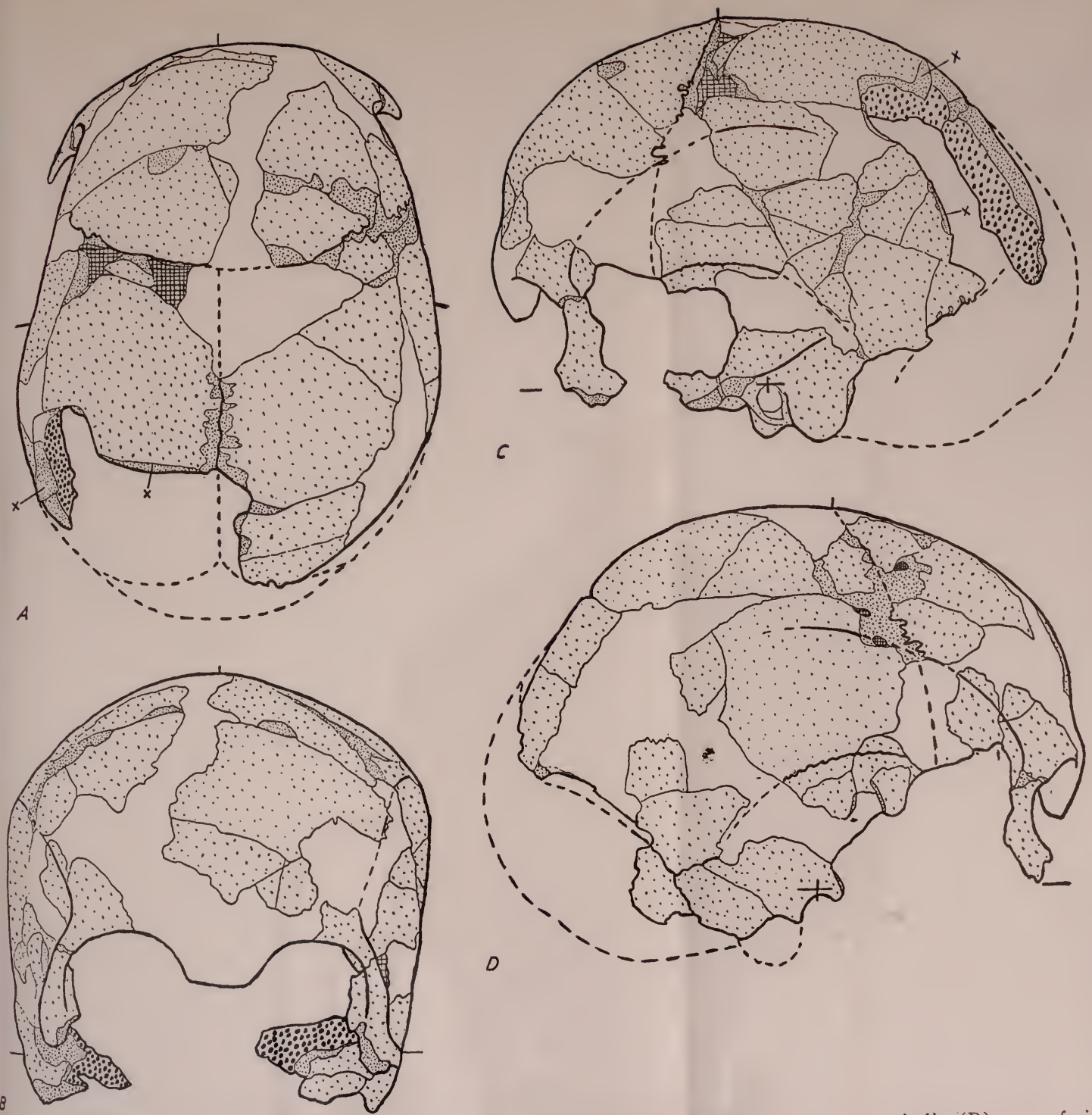


FIG. 1.—Stereographic drawings of the writer's reconstruction of the Melbourne skull in (A) norma verticalis, (B) norma facialis, (C) norma lateralis sin., and (D) norma lateralis dex. X indicates cut surface. Compare with photographs in plates 4 and 6. (Coarse stipple = natural bone surface; fine stipple = broken bone surface; included white areas = supporting "filler"; heavy dots = natural endocranial surface; crosshatch = openings.) ½ natural size.

believed that imperfections in this area account for the flatness of this side as contrasted with the right (fig. 1, B).

RECONSTRUCTIONS COMPARED

Let us now compare the two versions of the reconstructed Melbourne skull. Examination of the photographs (pls. 3 and 4) will show that more parts have been included in the first than in the second version. This is because the second version depends, with few exceptions, upon proven contacts between fragments, and no such contacts can be found for some of the smaller fragments. Indeed, some of the smaller fragments seen in the frontal region of the first version seem to have been placed in position without any justification. The same can be said about the assemblage of fragments occupying the midline near the occiput in the first version (indicated by the X in pl. 3). This assemblage is quite definitely a part of the frontal bone (right side) and has been located accordingly in the second version. In proof of this, as already indicated, I call attention to plate 5, which shows a positive impression of the vascular markings on the inner surface of the right fronto-parietal region. The symbols F_1, F_2, and F_3 denote parts of the frontal bone; P_1, P_2, and P_3, parts of the parietal. The assemblage P_1, F_1, F_2, and F_3 forms a unit with tight joints. Between P_1 and P_3 there is a defect in the bone; between P_1 and P_2 the joint surface is very thin, being damaged externally and narrowed internally by a vascular impression; and between F_3 and P_3 there is likewise contact of the inner table alone. The correct relationship of these fragments is indicated by the continuation of the vascular impressions as indicated by the arrows. Also, it is evident from figure 1, A, that the included portion of the coronal suture is symmetrical with that of the other side.

In figure 1, A and C, attention is called to a feature of the second reconstruction that seems to prove the correctness of the assemblage of fragments composing its left parietal. This feature, which is shown in more detail in plate 6, A and B, consists of an artificially cut edge, beginning at the sagittal suture about 7 cm. back of bregma and running laterally and somewhat diagonally backward. This edge is interrupted by a circular break in the bone, and hence consists of a medial portion 4.5 cm. long and a lateral portion 1.5 cm. long, separated by a gap 4 cm. wide. Nevertheless, both portions of this edge appear to be in the same plane (pl. 6, B), both being beveled so as to face upward as well as backward.[3] In Hrdlička's version

[3] This reconstruction was definitely verified by the finding of additional pieces of this parietal (see pp. 24-26).

these two portions of the cut edge are not in alignment, and, moreover, in contact with the medial portion is the fragment of right frontal discussed in the foregoing paragraph. The further significance of this cut edge will be discussed later.

The method used in reconstructing the second version of the Melbourne skull made it possible to obtain an endocranial cast. Besides further verifying the reasonably correct relationships of the cranial fragments, this cast has served to demonstrate two cranial features, the existence of which is completely hidden in the first version. Both of the features are internal surface configurations reflecting, undoubtedly, brain shape. The first of these features is an asymmetry of the frontal area. Here the right side is flatter than the left. The result is a rather pronounced crest along the midline extending as far back as bregma. There is no evidence of this shape externally; indeed, the forehead is nicely rounded.

The second feature of the endocranial cast is represented externally by the gap in the artificially cut posterior parietal edge described in the preceding paragraph (pl. 6, A and B). At this point the cast shows a marked prominence. Between the surviving portion of this prominence and the midline is a depression about 5 mm. deep. On the other sides there is a more gradual slope. And, of course, the posterior part, as well as the eminence is missing.[4] The bone surrounding the eminence is reduced in thickness as can be seen in plate 6, A, but still amounts to 5 mm. This structure certainly represents a brain tumor of some sort. The occurrence of two such unusual features in the same area, namely, a brain tumor and an artificial opening in the bone, may be a coincidence, because the nature of the cut is not clearly related to the shape of the tumor.

Let us turn now to the measurements, which show perhaps the most striking differences between the two versions. Table 1 shows that the first version is hyperbrachycranic, whereas the second version is dolichocranic. For further comparison with the first version I have used a hyperbrachycranic skull from Tampa Bay (U.S.N.M. No. 243,689). No skull with a breadth of 162 mm. is listed among the 700-odd specimens from Florida in the Catalog of Crania (Hrdlička, 1940a); indeed, less than 11 percent of those judged to be undeformed have a cranial index exceeding 85. For comparison with the second version I have used a skull of about the same size and shape from Pensacola Bay (U.S.N.M. No. 242,665). Dolichocrany (70.0-74.9)

[4] The subsequent finding of the posterior part of this parietal shows that the swelling in the endocast slopes off gradually in this direction.

is rare (4 percent) among the Florida skulls listed in the Catalog of Crania.

Comparing now the first version with the round-headed Tampa Bay specimen a great discrepancy will be seen between all measurements involving the landmark on the upper border of each ear opening known as porion (measurements Nos. 3, 5, 6, and 7). The

TABLE 1.—*Comparative measurements of the two versions of the reconstructed Melbourne skull and of two undamaged skulls representing extreme recent Florida types*

Measurement (mm.) or index	1st version	U.S.N.M. No. 243,689	2d version	U.S.N.M. No. 242,665
1. Maximum length	(182)[1]	180	(186)	184
2. Maximum breadth	162	154	136	136
Cranial index $\left(\frac{2 \times 100}{1}\right)$	*89.0*	*85.6*	*73.1*	*73.9*
3. Biporion-bregmatic height	134	124	122	123
Upper mean height index $\left(\frac{3 \times 100}{\text{mean of 1 \& 2}}\right)$	*77.9*	*71.2*	*75.8*	*76.9*
4. Minimum frontal diameter	102	100	94	97
Fronto-parietal index $\left(\frac{4 \times 100}{2}\right)$	*63.0*	*64.9*	*69.1*	*71.3*
5. Ectoconchion-porionic length, right	110	(72)	72	(74)
6. " " " left	105	(77)	66	76
Porion position index $\left(\frac{\text{mean of 5 \& 6} \times 100}{1}\right)$	*59.1*	*(41.4)*	*37.1*	*(40.8)*
7. Biporionic breadth	148	124	109	113
Biporion-parietal index $\left(\frac{7 \times 100}{2}\right)$	*91.4*	*80.5*	*80.1*	*83.1*

[1] Measurements and indices in parentheses are based upon estimates.

distance between the two ears (measurement No. 7: biporionic breadth) in the first version is 24 mm. greater than in the Tampa Bay specimen. Similarly, in measurement No. 3, the biporionic line is 10 mm. farther from bregma; and in measurements Nos. 5 and 6 as averaged, the distance from the lateral border of the orbit (ectoconchion) to porion is 33 mm. greater. Without attempting to furnish more proof, it can be said categorically that the position of the ears in the first version of the Melbourne skull is freakish.

No such discrepancies exist between the measurements of the second version and the long-headed skull from Pensacola Bay. Slight distortion of the former probably is indicated by its lesser biporionic

breadth, minimum frontal diameter, and left ectoconchion-porion length; but these measurements probably are still within normal limits.

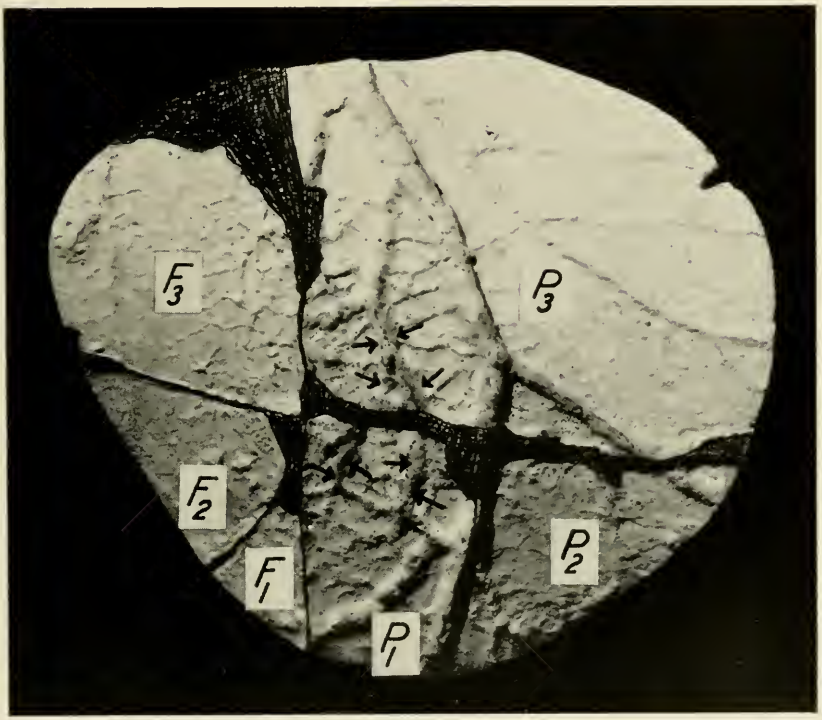
Summarizing these findings, the two reconstructions of the Melbourne skull represent extremes of skull shape; hyperbrachycrany (89.0) in the first version and dolichocrany (73.1) in the second. Only about 15 percent of undeformed Florida Indian skulls fall into these combined classes; the great majority (85 percent) fall into the intermediate classes of mesocrany and brachycrany. It seems certain that the width of the vault arrived at in the first reconstruction (162 mm.) is excessive. Also, the positions of the temporal bones and some of the frontal and parietal fragments in this version are definitely incorrect. In the main, however, the tremendous difference in shape represented in the two versions depends upon the imperfect joint involving about an inch and a half of the sagittal suture in the midparietal region. Since this joint, in addition to being damaged externally, is the sole contact between the two sides, it is capable of a hinge action. As this hinge is opened up, the vault becomes broader, and as it is closed, the vault becomes narrower. The accuracy of the reconstruction depends to a considerable extent, therefore, upon this joint.

Although the facts thus far presented probably will convince most readers that the second version of the Melbourne skull is the better of the two, doubtless many are still uncertain as to how nearly the new reconstruction approaches the original form. Owing to the pattern of the missing parts, no one could hope to reach perfection in reestablishing the relationships of the remaining parts.[5] Therefore, the best that can be done is to aim for a reasonable reconstruction. This, I believe, has been achieved.

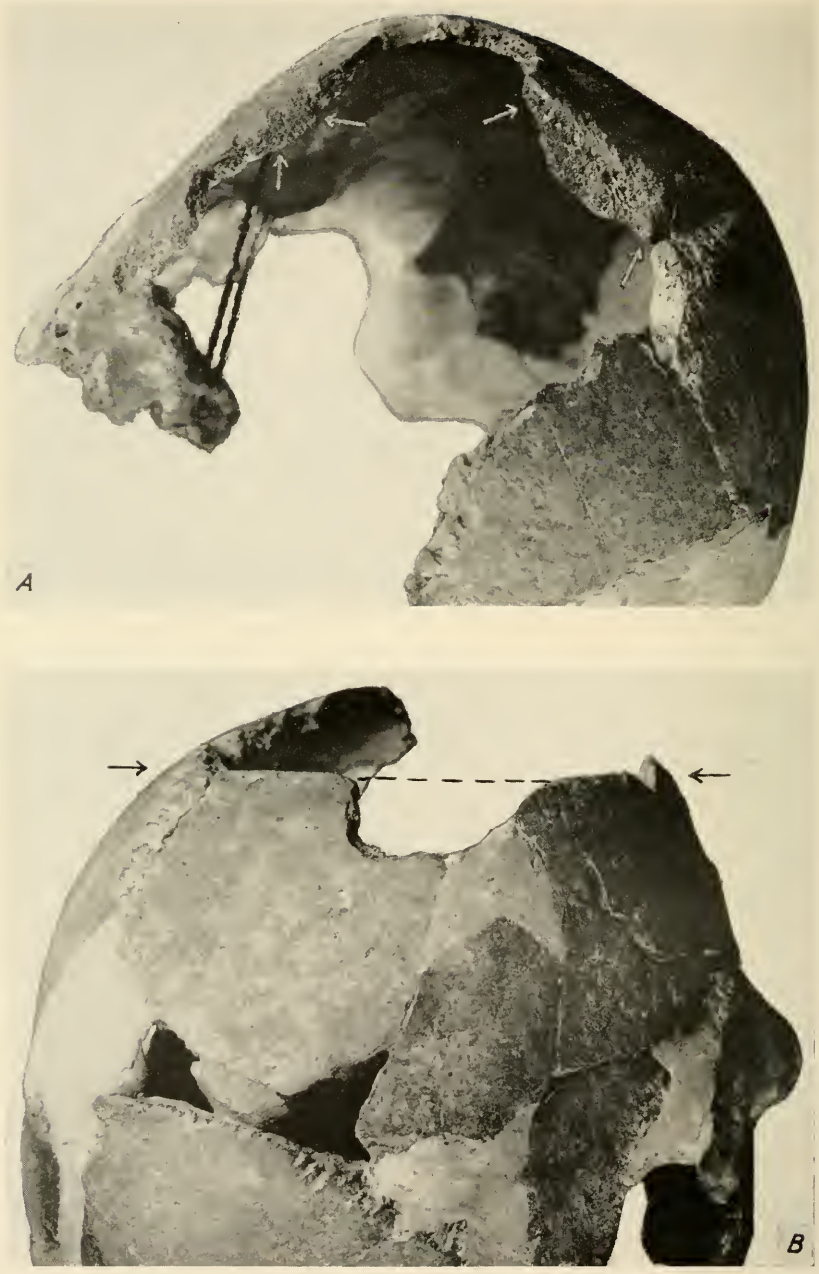
THE VERO SKULL

The question that arises at this point is: How does this new version of the Melbourne skull compare with the Vero skull, for which an equal age is claimed by the paleontologists and which also comes from Florida? Before answering this question it is necessary to discuss the Vero skull.

[5] I spent considerable time trying to show that the curvature of the parietal bone in transverse section is closely related to the horizontal shape of the vault. If such a relationship could be found, it could be used in the present case, because the original transverse curvature of the parietal is preserved. However, I found the same kind of parietal curvature in both dolichocranic and brachycranic skulls from Florida.



Plaster cast of endocranial surface in the region of the right half of the coronal suture. F_{1-3} indicate three portions of the frontal bone. P_{1-3} indicate three portions of the right parietal. Breaks between these parts have been inked in on the photograph. Arrows show the course of vascular impressions crossing the breaks and thus verifying the correct restoration of the parts.



Two views of the left parietal showing cut surface. A, the arrows indicate the extent of the two preserved portions of this surface. The circular break between the pairs of arrows perhaps has resulted from a thinning of the bone in this region, which in turn may have been caused by a brain tumor. Note also that the contact between the two parietal bones at the sagittal suture is limited to the inner table. B, the arrows and line of dashes indicate that the cut surface is a plane.

:) norma lateralis dex., and (
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ce of supporting "filler.") ½ na

Four views of the Vero skull oriented on the Frankfort horizontal. Note the slender connection between the frontal and right parietal. These views are interpreted in stereographic drawings (fig. 2, A-D). Approximately ⅓ natural size.

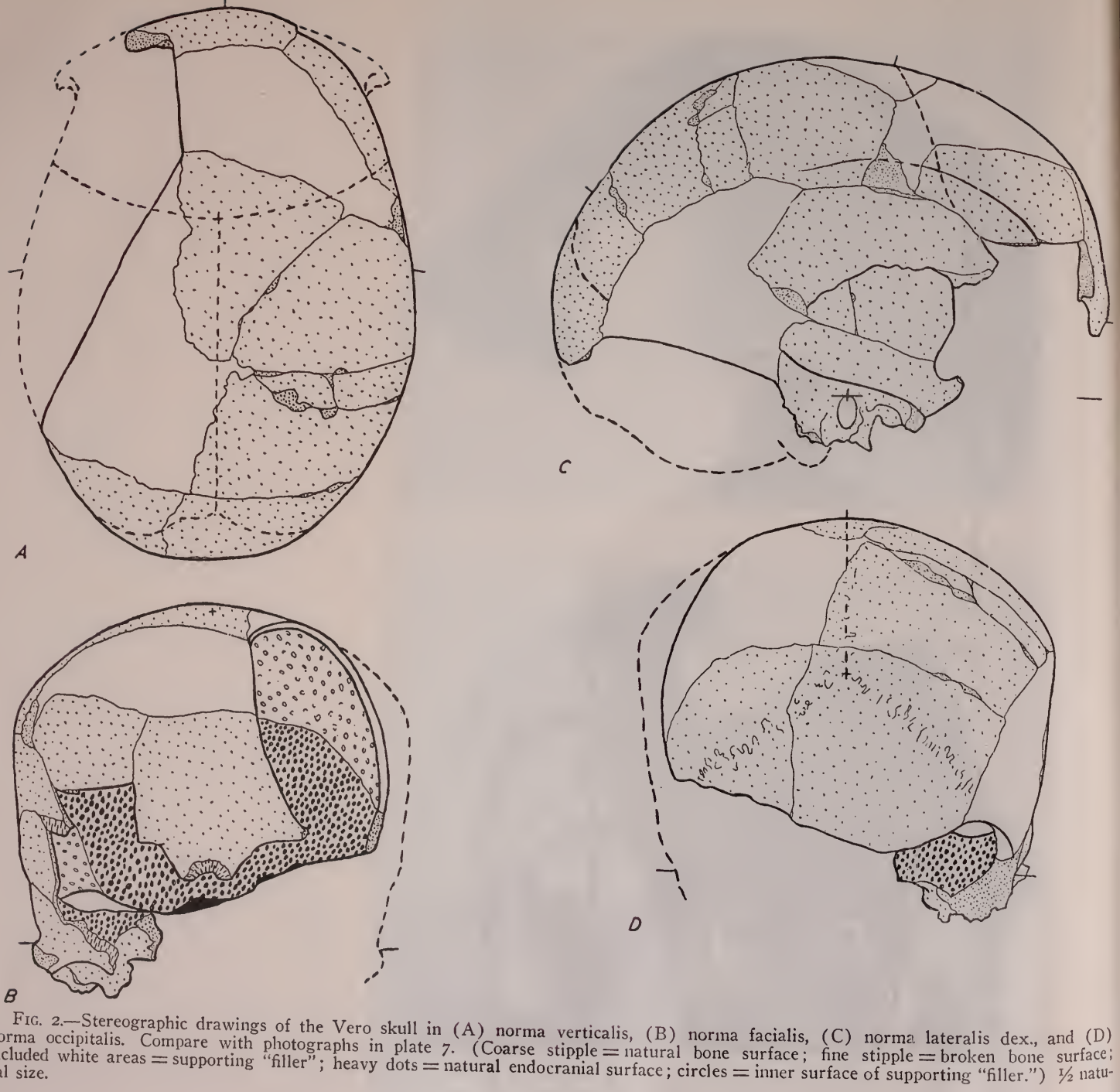
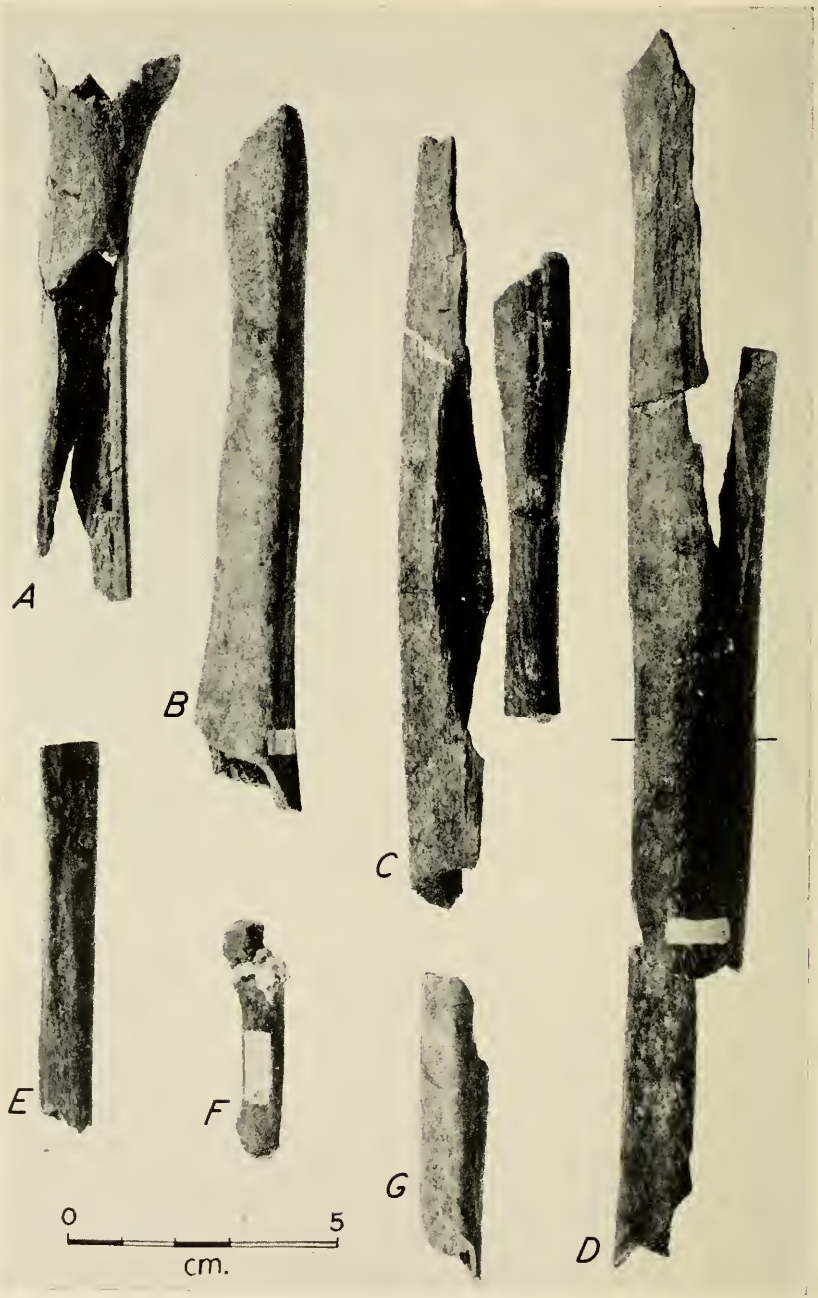


FIG. 2.—Stereographic drawings of the Vero skull in (A) norma verticalis, (B) norma facialis, (C) norma lateralis dex., and (D) norma occipitalis. Compare with photographs in plate 7. (Coarse stipple = natural bone surface; fine stipple = broken bone surface; included white areas = supporting "filler"; heavy dots = natural endocranial surface; circles = inner surface of supporting "filler.") ½ natural size.



Fragments of bones of the extremities belonging to the Melbourne skeleton. A, left humerus; B, right humerus; C, two parts of the left tibia; D, right tibia; E, left ulna; F, metacarpal (probably right fourth); G, left fibula. The line through the right tibia (D) is at the level of the cross section shown in figure 7.

According to Hrdlička's study of this skull (1918, pp. 55-57) the vault is incomplete, being made up of 16 pieces mostly from the right side. However, all these pieces join firmly and are sufficiently extensive so that the shape can be determined with some exactitude. Although Hrdlička's illustration (his pl. 10) shows a dolichocranic form, he fails to give measurements or to mention this fact. His description is limited to the following statements:

> The skull is large, finely shaped, of thoroughly modern features, and unusually thin. It shows a normal nasal process of moderate breadth (about 2.1 cm.); orbits with fairly sharp borders; glabella and supraorbital ridges subdued; forehead not high but well built; the sagittal region oval from side to side; the temporal ridges only mildly marked and at their nearest approach running at a distance of 7 cm. from the median line; parietal eminences gently developed; the occiput smooth and blunt; and the outline of the vault as viewed from above forming a fine ellipse. The thickness of the parietals ranges from 3 to 4 mm., which for a strong Indian is decidedly exceptional.
>
> The mastoid process shows normal masculine development; the auditory meatus is rather large and in cross section nearly circular; the zygomatic processes were of moderate masculine strength. [P. 56.]

Elsewhere (p. 55) he states that,

> The skull and bones are Indian, but they seem to belong to a type such as can occasionally be found among the Eastern Algonquian, or among the Sioux, rather than in Florida.

The Vero skull was reconstructed by Dr. Riley D. Moore, who was at that time Scientific Aid in the Division of Physical Anthropology. After the skull had been studied, it was returned to the Florida Geological Survey, but a cast, also made by Dr. Moore, was retained in the Museum (No. 299,245). This cast is unsatisfactory because the position of bregma is not indicated.[6] This landmark is important in the orientation of a skull lacking one of the temporal bones. In order to approximate the position of the conventional Frankfort plane, which is determined by the two ear openings and the lower border of the left orbit, it is necessary to judge the location of the missing ear opening from the relationship between the other ear and the median sagittal plane. In the Vero skull the median sagittal plane can be determined from the three preserved landmarks: nasion, bregma, and lambda. Thus, in order to make certain of the location of bregma, I found it necessary to consult the original.[7]

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[6] Since the sagittal and coronal sutures are almost entirely closed ectocranially, their juncture is determined in the original more by color than by relief. The photographs do not help in locating this point.

[7] I am indebted to Dr. E. H. Sellards for his help in arranging for the loan of the specimen and to Herman Gunter, State Geologist of Florida, for granting the loan.

When the original Vero skull was sent to me, I discovered to my surprise that, like the Melbourne skull, it too was filled with modeling clay (plasticine). Moreover, a block of plaster of paris had been attached to the clay to form a base, and where the clay showed in the skull vault shellac had been applied. Obviously, this was almost as unsatisfactory a specimen for study as had been the first version of the Melbourne skull. Also, because of its weight, it could not be set up in the Schwarz stereograph. And to make matters worse, the oil in the clay had kept the shellac soft and sticky. Owing to these circumstances, I requested and was given permission by Mr. Gunter to remove the plasticine and to reconstruct the parts as in the case of the Melbourne skull. The result is shown in plate 7 and interpreted in the series of stereographic drawings shown in figure 2, A-D.

An examination of these illustrations will convince the reader that the surviving portion of the frontal depends for its orientation upon a short (less than 3 cm.) connection with the parietal on the right side. Since the skull as a whole is remarkably thin, and at this point does not exceed 3 mm. in thickness, it should be apparent that considerable care is required in reestablishing this joint. Depending upon the nicety of this articulation, then, the glabellar region will vary in position in an anterior-posterior direction, and consequently the maximum length of the skull will be affected. The drawings represent, I believe, the best reconstruction possible and certainly do not exaggerate the length.[8]

MELBOURNE AND VERO SKULLS COMPARED

It should be apparent also from the illustrations of the Vero skull that it is similar in shape to the Melbourne skull as newly reconstructed. In order to show this more clearly I shall compare the two specimens both metrically and graphically. Also, because of the metric similarity shown in table 1, I shall include in the comparison the recent dolichocranic Florida skull from Pensacola Bay (U.S.N.M. No. 242,665). The measurements of these three specimens are shown in table 2.

According to these figures all three skulls are remarkably similar in shape; all have about the same degree of dolichocrany, and about the same fronto-parietal relationships. However, the Vero skull

[8] After the drawings and photographs were made, the frontal became detached in the course of making an endocranial cast. As finally restored by one of the museum preparators, the glabellar region has a more anterior position than in my restoration. As a result, the maximum length is several millimeters greater.

differs from the other two in its relatively low vault (upper mean height index) and thin wall.

Graphically these relationships are brought out well in figure 3, A-C. In superimposing the outlines of these three skulls the following parts were made to coincide: 1, the midline; 2, the most anterior projecting part of the supraorbital prominence; and 3, the Frankfort plane. This

TABLE 2.—*Comparative measurements of the Vero, Melbourne (2d version), and Pensacola Bay skulls*

Measurement (mm.) or index	Vero	Melbourne 2d version	U.S.N.M. No. 242,665
1. Maximum length	(185)	(186)[1]	184
2. Maximum breadth	(134)	136	136
Cranial index $\left(\frac{2 \times 100}{1}\right)$	*72.4*	*73.1*	*73.9*
3. Biporion-bregmatic height	111	122	123
Upper mean height index $\left(\frac{3 \times 100}{\text{mean of } 1 \text{ \& } 2}\right)$	*68.9*	*75.8*	*76.9*
4. Minimum frontal diameter	(99)	94	97
Fronto-parietal index $\left(\frac{4 \times 100}{2}\right)$	(*72.8*)	*69.1*	*71.3*
5. Parietal thickness (range)	2-6	R. 4-7 L. 4-9	4-6(?)[2]

[1] Measurements and indices in parentheses are based upon estimates.
[2] As near as can be measured when the vault is intact.

arbitrary arrangement satisfactorily shows the close agreement both in the main outlines and in the positions of the sutures. There can be no question therefore that the second reconstruction of the Melbourne skull is reasonable. Moreover, this reconstruction represents a form remarkably close to that of the Vero skull. These considerations outweigh the minor faults (asymmetries) in the reconstruction that these comparisons make evident and to which attention has already been called (pp. 7, 9-10).

OTHER DETAILS

Jaws.—As seen in plate 2, the lower jaw was discovered in a normal position relative to the skull; that is, the left ascending ramus —the one visible—is about where it would be when articulated with the skull, and the left horizontal ramus is about where it would be with the mouth open (postmortem jaw drop?). Little remains of the upper jaw except the teeth. Although the remains of the jaws were removed from the plaster of paris jacket and cleaned with the

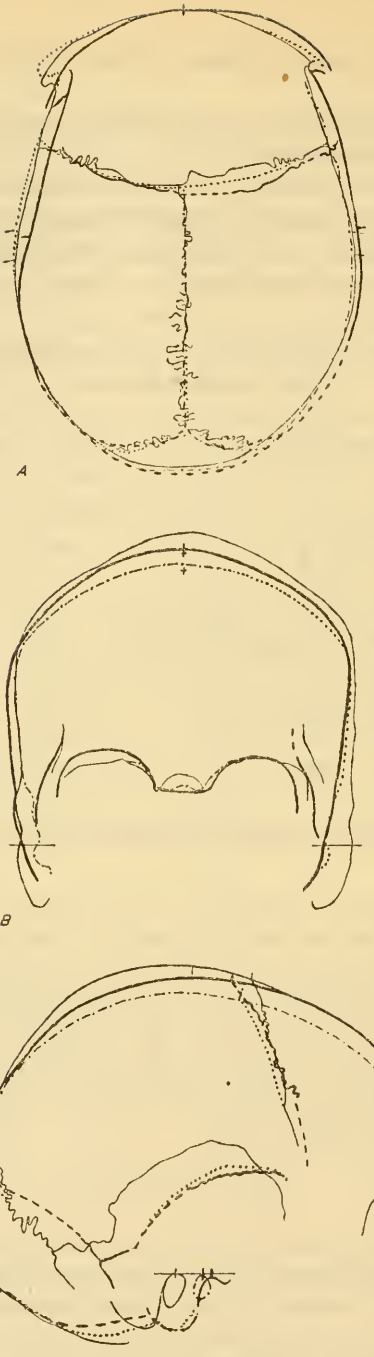


FIG. 3.—Superimposed stereographic drawings of the Melbourne skull (— — — —), the Vero skull (— . — . . . . .), and a recent Florida Indian skull (————————) in (A) norma verticalis, (B) norma facialis, and (C) norma lateralis dex. These drawings are oriented so that the most anterior projecting part of the supra-orbital prominence, the midline, and the line of the Frankfort plane all coincide. Note their fundamental similarity in shape. ⅓ natural size.

skull fragments, little attempt at restoration was made earlier. Presumably this was due to the absence of so many parts. Enough of the mandible can be assembled, however, to obtain a reasonably correct orientation of the symphysis. Utilizing this orientation, stereographic drawings (fig. 4, A and B) have been made in order to show the form of the fragments and a reasonable reconstruction of the missing parts.

These drawings suggest that the bicondylar breadth was in excess of that between the glenoid fossae of the reconstructed skull. Such was to be expected, however, in view of the asymmetry shown in figure 3, B, and in view of the small biporionic measurement recorded in table 1.

The gonial angle formed by the posterior border of the ascending ramus with the inferior border of the horizontal ramus is 113° as the specimen is oriented in the drawing, but when this angle is taken in the plane of the left ramus it is approximately 120°. Average figures for Florida Indians obtained according to the second method of measurement (Hrdlička, 1940b, p. 289) are as follows: Males (200), 112.7°; females (200), 117.5°. The angle found in the Melbourne jaw occurs in the ranges of both sexes, but is somewhat more characteristic of a female.

The only other measurement that can be taken on this specimen is the length (Hrdlička's "length of body" of lower jaw, 1939, pp. 139-140). This amounts to 91 mm. Consulting Hrdlička's averages for Florida Indians (1940c, p. 401), we get the following figures: Males (100), 102.5 mm.; females (100), 95.5 mm. According to the ranges for this measurement in the two sexes, the figure 91 does not occur among males.

The recovered teeth of the two jaws show extreme wear with resultant exposure in some cases of the pulp cavity. In the lower jaw the teeth either had been lost antemortem or were on the verge of being lost from recession of the alveolus.

Clavicle.—The left clavicle seen in plate 2 is damaged at both extremities. The shaft is rather slender (minimum diameter, 10 mm.) as in a female, but not altogether conclusive as to sex. Because of the great variability of the acromial end, any reconstruction of this part would be quite dubious. The only reason for undertaking a reconstruction would be to try to learn the sex. T. L. Woo's (1938) ingenious method of measurement and the nature of the fragment itself make it possible to fit the specimen into the dimensions of an

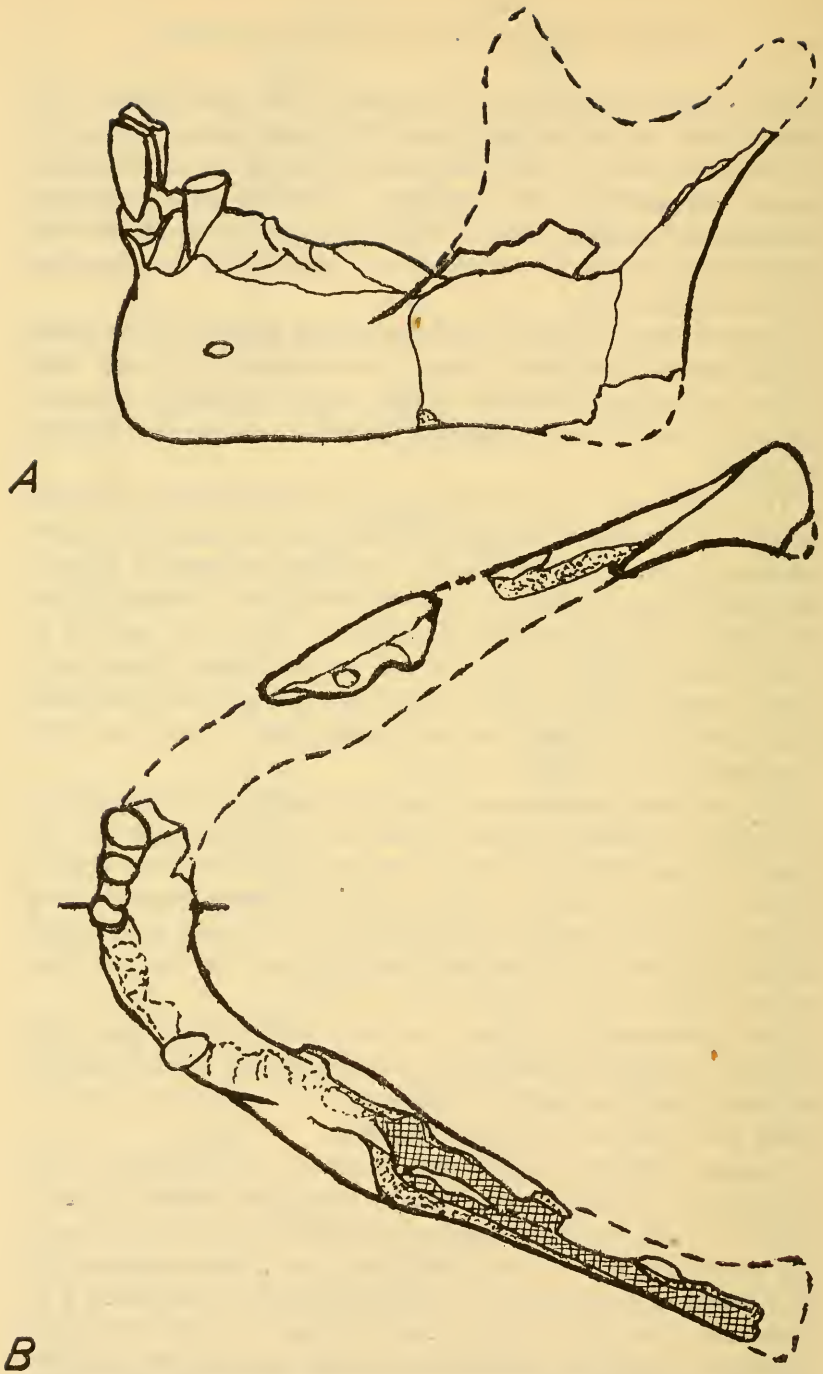


FIG. 4.—Stereographic drawings of the Melbourne lower jaw as viewed (A) from the left side, and (B) from above. The suggested reconstruction takes into account the midline of the symphysis. Compare with plate 2. Natural size.

average Chinese male or female.[9] It seemed to me, therefore, that such a reconstruction might indicate the likely sex of the fragment and in any case would be an interesting experiment.

Woo's method was not designed to be used for reconstructing the clavicle, but there is no reason why it cannot be used for this purpose, since it describes the bone so fully. Because this method probably is not widely known, a brief description as it relates to the reconstruction of the Melbourne fragment will be given.

The bone was oriented as nearly as possible in the horizontal plane defined by Woo,[10] and its outline drawn with the aid of the Schwarz stereograph. Working now with the drawing (see fig. 5, A), a base line was established by using the average maximum perpendicular or subtense of the diaphysis (*mp.d*) for Chinese according to sex (table 3). Next a curving line was dotted in midway between the two sides of the bone and the lowest point (*f*) on the curve in the acromial portion marked. The distance *f-c* (first segment) was then made to conform to the Chinese average and the point *c* tentatively located. Assuming point *c* to be at the acromial extremity, the maximum length of the bone (*a-b*) was supplied by the Chinese average. From the Chinese average maximum breadth of the sternal end (*mb.s*) it was now possible to sketch in this end and locate point *d*. Through point *d* was passed a broken line inclined 5° to the hroizontal (near the Chinese average). Where this broken line crossed the dotted line indicating the midline of the shaft, the point *e* was located. And at the acromial end the broken and dotted lines were adjusted to meet at point *c*. Finally, the outline of the acromial end was sketched in with the aid of average Chinese figures for maximum perpendicular (*mp.a*) and maximum breadth (*mb.a*).

It will be recognized that a certain amount of juggling is required in locating the points *c* and *d*. If *c* is not located at the acromial extremity as I have shown it—in other words, if this end is square—the segment at the sternal end must be shortened. To do this in the case of figure 5, A, would give the sternal end a somewhat stubby

[9] Because the Chinese belong to the Mongolian race and because they are the only group thus far studied by this method, it seems legitimate to use their average measurements in an experimental study on American Indians.

[10] Determined by three points, when the bone is held as accurately as possible in a horizontal position: 1, The midpoint on the superior medial edge of the sternal end; 2, the most projecting point on the anterior border of the bone at a distance of one-fifth of the maximum length from the acromial extremity (usually located at the sharp edge lateral to the eminence of the deltoid tubercle when present); and 3, the most projecting point on the posterior border at the same distance.

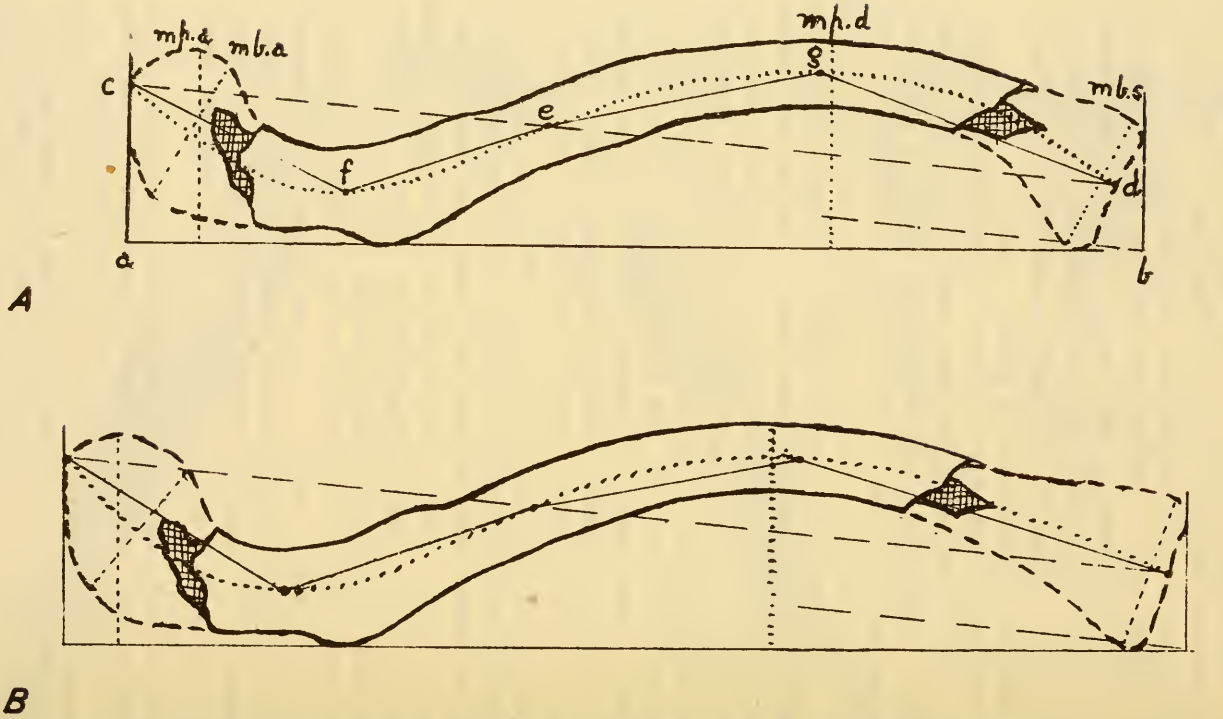


FIG. 5.—Two reconstructions of the Melbourne left clavicle based upon Woo's method of measurement and his average figures for Chinese. A, result when the average dimensions for Chinese females are used. B, result when the average dimensions for Chinese males are used. Abbreviations are explained in table 3. Compare with plate 2. Natural size.

appearance. On the other hand, it would improve the appearance of figure 5, B. I have not tried to refine my drawings, being concerned merely with determining whether the reconstruction was more convincing as based on the average measurements of one or the other sex. Unfortunately, I am unable personally to choose either between fig. 5, A, or fig. 5, B, or the two sets of measurements given in table 3. I must conclude, therefore, that the clavicle is too variable to yield its sex identification by such means.

TABLE 3.—*Average measurements of Chinese left clavicle (Woo, 1938) used in the reconstruction of the Melbourne clavicle and resulting measurements of the latter*

	Male		Female	
Measurement (mm.) or angle	Chinese	Melbourne	Chinese	Melbourne
Maximum length (a-b)	*149.6*[1]	*149.6*	*135.3*	*135.3*
Transverse diameter at middle	12.9	10.0	11.4	10.0
Total arc (c-d)	155.7	158.0	142.6	141.0
Outer arc (c-e)	64.2	69.5	62.0	60.5
Inner arc (e-d)	92.0	88.0	81.4	79.0
Total chord of clavicle (c-d)	143.7	147.5	131.9	132.0
First segment (c-f)	*33.9*	*33.9*	*31.4*	*31.4*
Second segment (f-e)	27.1	35.0	27.8	28.0
Third segment (e-g)	41.4	35.5	37.6	37.0
Fourth segment (g-d)	46.2	51.5	39.6	42.0
Maximum perpendicular of acromial end (mp.a)	*28.0*	*28.0*	*25.5*	*25.5*
Maximum subtense of diaphysis (mp.d)	*29.9*	*29.9*	*27.4*	*27.4*
Maximum breadth of acromial end (mb.a)	*21.5*	*21.5*	*19.9*	*19.9*
Maximum breadth of sternal end (mb.s)	*20.1*	*20.1*	*17.9*	*17.9*
Minimum breadth of shaft	10.4	10.0	9.2	10.0
Outer angle (cfe)	141.9°	130.0°	142.6°	135.0°
Inner angle (dge)	152.9°	153.0°	152.3°	149.0°
Inclination of entire chord	*4.7°*	*5.0°*	*5.2°*	*5.0°*

[1] The italicized elements were used in the reconstruction and hence are the same in Chinese and Melbourne. All the figures for the Chinese have been taken from Woo's table 1 and refer to his Hsiu Chiu Shan series.

DISCUSSION

In the foregoing sections I have attempted to show that: 1, the first reconstruction of the Melbourne skull is unbelievably bad from every point of view; 2, that the second reconstruction is anatomically convincing; and 3, that as now reconstructed the Melbourne skull is surprisingly similar in form to the Vero skull, which was found under like circumstances. I have shown, moreover, that the fragmentary nature of the Melbourne skull makes it impossible to determine its original form with complete accuracy. Nevertheless, the new version

must approximate the original form because it depends upon careful matching of the fragments and not upon a preconceived notion of what the form was.

In considering now the significance of the similarity between the Melbourne and Vero skulls it is assumed that the paleontological observations of Gidley and Loomis are correct. Our problem then is to judge whether these skulls are consistent from the morphological standpoint with the antiquity assigned to them by the paleontologists.

Back in 1918 when Hrdlička described the Vero remains he summarized his opinion as follows:

> Considering the skeleton as a whole, the conclusion is inevitable that it is that of an Indian; yet there remains some persistent doubt whether it is not the skeleton of a white-Indian individual. If not, there remain only two other possibilities: one that it is an exceptional, superior skeleton of a Florida Indian of Algonquian origin, the other that it belonged to an individual from some non-Floridian tribe. It should be once more emphasized, however, that all the features in which the various parts of the skeleton differ from those of an ordinary Florida Indian are features pointing toward higher or more modern development. There is no feature of the skeleton that would suggest even remotely an individual more ancient or anthropologically more primitive than the Indian. [P. 59.]

We may ignore here the suggestion of White admixture, because elsewhere (p. 55) Hrdlička says that "a detailed study of the bones has definitely removed this impression." The significant thing about the statement is that Hrdlička recognized the Vero skull as being different from the great majority of those found in Florida, yet completely modern. Later he unconsciously emphasized this fact when he published his measurements on Florida crania (1922, 1940a). As I have pointed out (pp. 8-9), the 700-odd undeformed crania from Florida that he measured include only about 4 percent with cranial indices below 75, the class in which the Vero skull falls. Even the modern specimen that I have used in my comparisons comes from Pensacola Bay and thus is not from the peninsular part of Florida.

The similarity of form between the Vero skull and the new version of the Melbourne skull means that the latter, too, is a stranger in Florida. And both of these strangers were found 40 miles apart and in a geological stratum containing mastodon and mammoth remains. This can hardly be a coincidence.

In trying to characterize the Vero racial type Hrdlička speaks of the Algonquian and Siouan Indians. In 1918 both of these groups were recognized as being longer-headed than the Florida Indians. However, it was not until 1927 that Hrdlička called attention to a fundamental difference between the Algonquians and Sioux; namely

that the former are high-headed, whereas the latter are low-headed. Since Hrdlička did not specifically mention the height of the Vero skull, it is unlikely that he knew at that time of any physical differentiation between the Algonquians and Sioux. Strangely enough, the Vero skull is low in biporion-bregmatic height (upper mean height index 68.9) and thus rather different from the late Florida type.[11] It should be remembered, however, that although the Vero skull is below the average of eastern Indians in cranial height, it is still within their range.

Even if cranial height is of uncertain significance here, the evidence seems to indicate that both the Vero and the Melbourne skulls, being dolichocranic, are not typical of the late Florida Indians. At the same time, this dolichocrany fits them into our present concept of the earliest type found on the continent. Actually our direct knowledge of this early type goes back only to the bearers of the archaic cultures in the East and to the Basketmakers in the West. The skulls associated with both of these cultures are long-headed. Indirectly, however, some see indications of antiquity in the peripheral distribution of the long-heads. Dixon (1923) expresses this view as follows:

> . . . for Europe the determination of the sequence in which the several types appeared in the continent and spread over its surface, rests in the main upon definite stratigraphic or archaeological and historical evidence. In the New World little evidence of this sort has as yet been brought to light, so that here we are forced to rely largely upon what is frankly a less certain indication of relative age, but one which is, nevertheless, generally accepted as valid in current studies of the distribution and history of animal species. This is the principle that in the distribution of species within any large area, such as that of a whole continent, those which are marginal are in general to be regarded as the earlier, in comparison with species having a more central habitat. The older species, whose territory is invaded by another type, gives ground and is in the end either pushed toward the periphery, or forced into "refuge areas" where life conditions are less favorable than in the rest of the region, the better and more favorable lands being appropriated to themselves by the newcomers.
>
> Assuming, then, that a peripheral distribution tends to indicate a relatively ancient stratum of population, whereas the more recent immigrants are to be looked for nearer the centre, we may learn much by observing what is the distribution of the human types within the North American continent.
>
> * * * *
>
> The most cursory inspection reveals one fact of great significance, *i.e.*, the dolichocephalic types are concentrated in a very striking fashion in marginal areas. . . . The evidence afforded by geographic distribution thus indicates that the dolichocephalic types are, relatively, to the brachycephalic, the older oc-

[11] Judging from G. K. Neumann's figures on cranial height (1942), the upper mean height index is close to an average of 73 in eastern Indians and near 67 in the Plains Indians.

cupants of the area. Since this result is corroborated by such stratigraphic and archaeological evidence as has yet been obtained in North America, and is furthermore in accord with the evidence which we possess of the sequence of types in other parts of the world, it seems safe to accept the conclusion, at least provisionally. [Pp. 398-400.]

It should be clear from the foregoing discussion that the Melbourne and Vero skulls, instead of being like the majority of recent Florida Indians, are rather like their more long-headed neighbors to the north and therefore consistent with what little we know of the earlier American types. That these earlier types were very little, if any, different from recent American Indians seems quite likely in view of Weidenreich's (1939) description of Upper Paleolithic skulls from China. So modern-seeming are these skulls that in one case Weidenreich has found his best comparison with a long-headed Texas Indian. Here, in spite of being separated by at least 20,000 years and the Pacific Ocean, these two skulls are of the same type. This new viewpoint on the physical characteristics of the first peoples to reach this continent from Asia is set forth in the following statement by E. A. Hooton (1937):

> To me it seems clear that the Late Pleistocene antiquity of a human skeleton found in the New World cannot be refuted by a demonstration of the modernity of its anatomical characters alone. *Homo sapiens* was full-fledged in the Old World before the end of the glacial period. Late glacial entrants into the Americas need not prove their age by an array of archaic and simian physical features. The acid test of their antiquity must be geological. . . . On the whole, it seems to me that American anthropologists without relaxing their determination to submit each find of allegedly fossil man to every possible test of archaeological, geological and palaeontological antiquity, should not impose unreasonable morphological restrictions upon candidates for recognition. [P. 112.]

Thus, if we are correct in our conception of man's physical development at the close of the Ice Age—that he was relatively long-headed and of modern form—there is no reason from the viewpoint of morphology for denying such antiquity to the Melbourne and Vero remains.

There is only one detail, and this concerns the Melbourne skull, that is disturbing to the view that we are dealing with ancient specimens. I refer to the cut surface in the left parietal. As pointed out, the two remaining portions of this surface seem to form a plane in the new reconstruction, although the parietal has been assembled from a number of pieces. This suggests that the cut was made while this part of the parietal was whole and not after it had been broken. If the cut had been made after the parietal had been broken, and this can only mean by a shovel during excavation, then it would seem

unlikely that the cut surface would still present a single plane now that the pieces are restored to their natural positions. Of course, the parietal could have been whole when struck by the shovel and been broken subsequently.

If, on the other hand, this cut surface represents a death blow, how could it have been made in ancient times? It would seem that a cut represented by an extensive smooth surface must have been the result of a blow from a thin blade of hard material. This blade would have penetrated the skull to a depth of at least 2 cm. The possibilities of ancient man, and even of late prehistoric Indians, possessing such a blade seems rather remote. Copper, the only metal available in quantity in North America came into use quite late and even so would not likely be sufficiently hard to cut fresh bone so cleanly. Chipped or polished stone blades of the necessary size and thinness were unknown in Florida, or at least until quite late, and it might be debated whether they would cut cleanly. Shell was available, of course, in Florida, but it is unlikely that such a large blade could be obtained from this source. The only other material from which a blade could be made is wood, and it would be too soft for this purpose.

Unfortunately, the bone opposite the cut surface was not recovered [12] and there is no record as to whether or not the excavators struck the specimen with a shovel. The absence of the posterior portion of the left parietal could mean either that the cut is old and the fragments long ago became separated, or that a shovel had merely shaved off the edge of an old break leaving little in the way of recognizable fragments. Although the left parietal was on the under side of the specimen as discovered, it does not seem impossible that a shovel could have struck it in this position. Moreover, since a skull long buried in wet muck would be soft,[13] no great force would be required for a sharp shovel to cut it, much less shave a broken edge. These

[12] It was not known, of course, when this was written that these parts were in Gidley's collection in the Division of Vertebrate Paleontology. It is of interest that the conclusion reached in this paragraph before the missing parts were recovered has been verified (see p. 25).

[13] There seems to be no information in connection with either the Melbourne or Vero finds concerning the hardness of the bone when discovered. Since they seem to have been buried in muck (Gidley and Loomis, 1926, p. 258-259), and the color of the bones bears this out, they probably were rather soft on exposure. Certainly the skeletal material found in muck at Belle Glade, Florida (Stirling, 1935, p. 374), was so soft that it could be cut with the fingernail and broke under very little pressure (personal communication from Dr. M. W. Stirling). After exposure, material from a muck deposit rapidly hardens.

considerations seem to me to favor the interpretation that the cut was made during excavation. However, I have not been able to satisfy myself that the cut surface looks fresh, and under the circumstances I am not sure that it should.

Finally, we should review the evidence relating to the sex of the Melbourne specimen. Hrdlička (1937a) has characterized it as a male, just as he did (1918) the Vero specimen. Since now it appears that the skulls of these two specimens are practically identical in size, this sex identification at least is consistent. However, size, especially when not one of the extremes, is not in itself a reliable indication of sex. As a matter of fact, the size of the Melbourne and Vero skulls could be in the range of either sex. Nevertheless, the thinness of the bones of the vault in the Vero skull would suggest a female. In both skulls, also, the upper orbital borders are sharp and the supraorbital ridges do not appear to be of masculine proportions. The clavicle, moreover, is slender as in a female, and the proportions of the lower jaw suggest a female. These considerations, although admittedly inconclusive, seem to favor the female sex.

ADDENDUM

After the manuscript of the foregoing text was finished, it occurred to the writer that an effort should be made to locate the other human skeletal parts which Gidley and Loomis mention having found, but which have not figured in subsequent studies. To quote these authors (1926, p. 259):

> In the No. 2 bed were found numerous fragments of fossil bone which gave evidence of Pleistocene age for the bed. More important, as this excavation progressed, a crushed human skull with pieces of finger, arm and leg bones near it, was located. This was found within a few inches of the top of No. 2 bed. Within a foot of the skull was found a fossil horse tooth; nearby and at the same level, several bones of other animals, including an extinct species of box turtle . . . the jaw of a tapir."

Fortunately, Gidley's Florida collections are still segregated in the Division of Vertebrate Paleontology, and still bear his original labels. Thus only a brief search was required to locate the material mentioned in the above quotation. The covering labels describe the material as "Homo No. 1" and bear the date "June 26, 1925." Study of this material reveals the following bones: Three articulating parts of the posterior left parietal, fragments of both humeri, fragments of both tibiae, a piece of the distal half of the left ulna, a piece of the proximal half of the left fibula, and probably the right fourth metacarpal (extremities damaged). The last is presumably the piece of "finger" mentioned in the quotation.

It should be emphasized that these newly found parts do not controvert the conclusions already reached; mainly they verify or support them. Because of this I have not attempted to rewrite the foregoing text. In fact, I think it is more interesting to have the story as it was thus worked out. Here I shall merely describe the individual items and call attention to a few significant points regarding them.

Parietal fragments.—Figure 6, A and B, show these fragments as now placed in the assembled skull. In order to ensure the best possible articulation of all the fragments making up the lateral portion of the left parietal, they were taken apart and reassembled in relation to the additions. As can be seen from the figures, very little change in outline has resulted.

As suspected, the new fragments do not show a cut surface corresponding to that on the parts with which they articulate. This bears out my earlier impressions that only one of these broken edges had been shaved by the shovel. Because of this smoothing of the edge, the exact articulation at this place is in doubt. However, as now arranged there is an endocranial vascular impression lining up on both sides of the break.

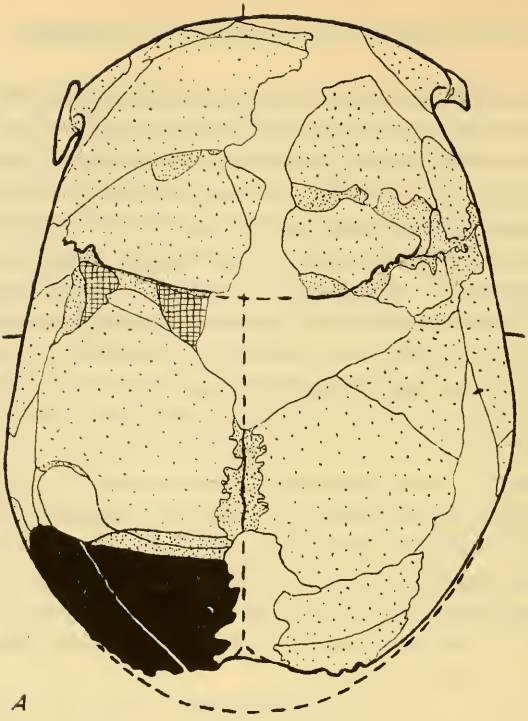
Extremity bones.—All these bones (pl. 8) have a slender build similar to that of the clavicle. The net impression from this is that we are dealing with a female. The fragment of right humerus includes the lower end of the rough surface where the deltoid muscle inserts. At this level, which is about the middle of the bone, the shaft is roughly plano-convex in cross section (Hrdlička, 1939, p. 152). Here the maximum diameter is 17 mm. and the minimum diameter is 14 mm. The index, 82.4, is above the average—that is, rather rounded—for Indians.

According to Hrdlička (1918, p. 58):

> . . . the shaft [of the Vero left humerus] is plano-convex in shape, and platybrachic. Its dimensions slightly below the middle are: Diameter lateral (greatest breadth), 2.2 cm.; diameter antero-posterior (least thickness), 1.4 cm.; at middle they were probably 2.3 by 1.5, with the index of 65.2.

At what is judged to be about the middle of the right tibia a cross section was obtained and is shown in figure 7. Although this is a relatively undifferentiated shape, it shows a tendency toward the development of a posterior median ridge. I have called attention recently (Stewart, 1945) to the presence of this ridge in some tibiae from Texas found under conditions suggesting a considerable age. However, this shape is not uncommon in modern Indians.

Although but a small piece of the right tibia of the Vero skeleton was recovered, and this is not identified as to position, Hrdlička



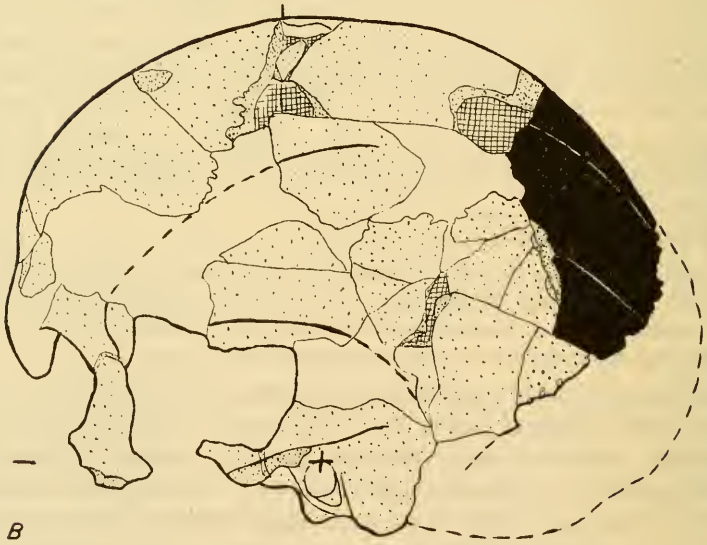


FIG. 6.—Stereographic drawings of the Melbourne skull made after three new pieces of the left parietal (shown in black) had been found and placed in position. A, norma verticalis; B, norma lateralis sin. Compare with figure 1, A and C. (Coarse stipple = normal bone surface; fine stipple = broken bone surface; included white areas = supporting "filler"; crosshatch = openings.) ½ natural size.

(1918, p. 58) says, "The *tibiae* . . . were typically prismatic . . . and strongly built."

FIG. 7.—Cross section of right tibia near the middle (level shown in photograph, plate 8). Viewed from the proximal end with the anterior border upward. Note the rounding of the posterior border. Natural size.

Lastly, attention should be called to the type of breakage represented by these fragments. Is this something that took place in ancient times? What became of the other parts? It is difficult to give a satisfactory answer to these questions, and especially since nothing is recorded as to the relationships of these bones when found. We do not know even how careful a search was made for the missing parts. Certainly such large bones as the femora, if still related to the tibiae, would not likely be overlooked. This suggests that the skeleton was already incomplete when covered up. It may be questioned on these grounds, therefore, whether it was a natural burial.

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