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Charles Lange

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vessels fall in this group), Gallina coarse utility, Gallina punched ware, Gallina cord marked, and eastern Colorado maize marked.

A BRIEF SUMMARY OF A CRANIAL SERIES FROM
NORTH CENTRAL NEW MEXICO

CHARLES H. LANGE, JR.

The cranial material summarized in this discussion was obtained from four sites in the area known as the Gallina region lying in north central New Mexico.

These four sites, with the corresponding catalogue numbers assigned them by the Museum of the University of New Mexico, are as follows: Cuchillo (Bg2 60/1-16), Nogales (Bg3 60/1-18), Gavilan (Bg4 60/1-2), and Tapecitoes (Bg5 60/1-2). A fifth site at Cerrito (Bg1 60/x) yielded no skeletal material.

The skeletal remains form a part of the material obtained from a series of excavations in the Gallina area under the direction of Dr. Frank C. Hibben of the University of New Mexico during the summers of 1937, 1938, and 1939¹

While the number of burials, thirty-eight in all, resulted in a cranial series which is admittedly of doubtful statistical importance, the homogeneity of the group causes it to be of greater interest and value than would ordinarily have been the case in such a small series. This summary may then be regarded as purely an introduction to the physical anthropology of the Gallina region, rather than any conclusive, or statistically important, contribution. In the light of the present data, it seems very probable that with further additions this series will represent an important adjunct to the physical anthropology of the Southwest.

The condition of the crania, and other skeletal material, varies quite widely. Several crania were in very good condition while many of them were fragmentary and yielded only a few valid observations and still fewer valid measurements. The sixteen burials from Cuchillo were badly charred and fragmentary, and these accounted for many of the *lacunae* in the tabulations. In compiling summaries and drawing conclusions, the observations and measurements of all immature individuals (under sixteen years) and those of questionable accuracy were omitted. This, in the majority of instances, gave a frequency of from three to twenty items, usually about twelve.

Differentiation was also made in regard to sex. Here, cranial criteria were checked by those of the pelvic bones, with the latter receiving preference in case of any doubt.² Five adult burials were entered as "Uncertain" in regard to sex, and the measurements and

1. The author wishes to acknowledge the aid and coöperation of Dr. Hibben in the study of this material.

2. Skeletal material, other than crania, was studied by R. E. Bell, University of New Mexico, who also aided in checking sexing criteria.

observations obtained therefrom were naturally omitted from the summaries of the males and females, but they were included in the summaries of the series as a whole.

The group of immature crania require but few comments. There were seven of these crania, and while they were measured, the results are of not enough validity to warrant repetition here. However, observations obtained in several cases seem worthy of mention. Several characteristics commonly observed upon the adult crania are found to be also typical of the immatures and serve to further emphasize the homogeneity of the series. Among these traits are the following: pronounced lambdoid flattening, wide, low nasal bones, concavo-convex nasal profiles, square orbits, high palates, and alveolar prognathism. Perhaps the most outstanding features observed upon the immature crania were the presence of large, clearly defined Inca bones in Bg3 60/2 and Bg3 60/8. No example of an Inca bone was found in any of the mature crania.

Very little differentiation was noted between the adult male and female crania. Male mastoids were but very little larger than those of the female; both being recorded as "medium" in most cases. Super-orbital development was likewise quite small in the males as well as the females. In other respects, the sexes were of such similarity that the following list of traits may well serve to characterize the "Typical Individual" of the Gallina region, either male or female: cranium ovoid as viewed from norma verticalis, brachycephalic (both uncorrected and corrected), pronounced lambdoid flattening and curvature of the occipital region, traces of metopism, large parietal bosses, medium mastoids, ridge-shaped occipital torus, general simplicity of sutures (mainly open except for the following case of advanced or completed occlusion, e.g., Bg2 60/2, Bg2 60/5, Bg2 60/14, Bg 3 60/3, and Bg3 60/13), pterion forms in K, concavo-convex nasal profile, leptorrhine, parabolic-shaped palate, very high palate, absence of palatine torus, median chin form, alveolar prognathism, absence of mandibular torus, shovel incisors, absence of accessory cusps and supernumerary dentition, psaliodonte, and complete eruption of dentition.

Before comparing the Gallina series as a whole with other series, there are the following observations of unusual interest.

The dentition was relatively uniform. No supernumerary teeth were found, and only one accessory cusp was noted, (Bg3 60/2, upper left second premolar). In Bg3 60/16 the upper right third molar had not erupted. In Bg5 60/2 there were no erupted third molars, and the upper left third molar was not even indicated in the maxillary. This individual was listed as a female of from twenty-five to thirty-five years of age. In this same individual a very large abscess had enlarged in the root area of the canine and two premolars of the right maxilla.

The mandible of Bg2 60/1 is of pathologic interest. The right

ascending ramus is missing (post-mortem), while the left ramus has no condyle. The development of this condyle appears to have been interfered with by the growth of a large abscess at the level of the left mandibular notch. The left side of the mandible had been pushed in along and below the alveolar region, a deformity corresponding with a similar warping of the left maxilla. The left gonial surface is very rough; immediately anterior to this region there is a pronounced notch which exaggerates the inferior gonial extension. However, gonial eversion is not particularly prominent. In addition to the large abscess and accompanying bony growth in the region of the sigmoid notch and condyle, the left coronoid process is also deformed, being reduced to a spike. The wear on the dentition is naturally asymmetrical, and the lower left third molar is absent. The deformity cannot be explained by any fracture since there is no indication of such in the bone. This warped condition could have occurred in either the foetal or a pathologic state. The latter alternative seems much more probable since frequently osteomalacia (bone softening) is found in association with osteitis fibrosa cystica (bone abscess).³

Crania Bg3 60/1 and Bg3 60/3 each exhibit a pronounced sulcus along the posterior portion of the sagittal suture. These sulci are approximately two centimeters in width and .5 centimeters in depth.

Cranium Bg3 60/4 had a large abscess in the right temporal bone between the mastoid and the auditory meatus.

Crania Bg3 60/1 and Bg4 60/1 both abnormally long inferior spines on the internal pterygoid plates.

Cranium Bg3 60/7 gives possible evidence of violence. The left frontal bone and orbit were split by what appears to have been an axe blow. No other crania or fragments yielded any similar evidence although arrowheads were found imbedded in the charred flesh of burials at Cuchillo.

Post-coronal depressions were absent or very slight, and in Bg3 60/12 the depression was pre-coronal.

The lambdoid deformation of the skulls of this series is pronounced and consistent throughout from immature to adult individuals. The cause of this deformation appears to be an unsettled question. Hooton is of the opinion that deformation of this type is natural.⁴

The type of deformation I have called "lambdoid" is a flattening of the "crown" of the head. The flattened area is round or oval and its transverse axis is perpendicular to the sagittal axis of the skull, but an inferior extension of the plane of flattening makes an angle of about 35° to 45° with the eye-ear plane of the skull. The flattened surface thus sloped downward and backward from the obelion region to a point somewhat below lambda. Below this flattened area the occiput

3. Campbell, W. C.: *A Textbook on Orthopedic Surgery*. W. B. Saunders Co., Philadelphia and London, 1930, pp. 467, 473.

4. Hooton, E. A.: *The Indians of Pecos Pueblo; A Study of Their Skeletal Remains*. New Haven, 1930, pp. 37-38.

may be pronouncedly or moderately protruding. If this lambdoid flattening is artificially caused it can have been effected only by pressure exerted upon the crown of the head just behind the vertex. This pressure would have to be exerted downward and forward, unless the head and the whole body were pressed up against a forward-sloping board of pad. The lambdoid deformation is a flattening of the posterior portion of the top of the cranial vault and is exactly the opposite of the flattening of the frontal bone familiar in certain Indian groups. By no conceivable contortions of the infant could this flattening be effected by lying upon the back with the head resting on the occiput. It would hardly be possible to produce such an effect even if the infant were stood upon its head or the cradle carried upon the mother's back in an inverted position.

In most instances this lambdoid flattening is certainly not caused by artificial deformation. It has been observed in the so-called "Cro-Magnon" types of the Late Palaeolithic period and it can be seen in many crania of European and non-European peoples of the present day. It is especially noticeable in the skulls of Armenoids and Finns. For some time it has been my opinion that this lambdoid flattening is a feature found in the crania of people who are the result of an inter-mixture of a brachycephalic and a dolichocephalic type.

In such cases this lambdoid flattening may be a form of cranial disharmony brought about by mixture of contrasting cranial types. This explanation would be valid in the case of Pecos people, in whom crossings of round-heads and long-heads were very common. But a certain number of these skulls with lambdoid flattenings give one the distinct impression that artificial pressure has been exerted upon the crown of the head to produce the condition in question. A possible explanation of this apparently artificial lambdoid flattening may lie in the alternation of growth tendencies in heads of mixed types. A child which had inherited factors for headform from strongly contrasted parents might be born with a flattened occiput which would become more flattened as a result of cradle-board deformation. Subsequently a tendency toward the development of the projecting occiput might manifest itself, with the result that the lower portion of the occiput region would be prolonged backward, leaving the earlier occipital deformation as a flattened area sloping downward and backward above the convexity of the inferior portion of the occiput. A similar explanation, but without the introduction of the cradle-board flattening, might also explain the lambdoid flattenings so common in mixed Europeans. This is, of course, a speculation. Possibly some support for it may be adduced in the well-known fact that children of mixed blond and brunet ancestry often are born with blue eyes and blond hair which subsequently darken in an irregular fashion. That seems to constitute an approximately analogous case. However, it must be confessed that I can offer at present not scientific evidence in the way of actual observations upon growing children who present lambdoid flattenings.

While, as Hooton points out, there is no absolute proof as yet as to the cause for this lambdoid flattening, the case for the natural

occurrence of this deformation seems plausible. This is especially true in view of the numerous lambdoid flattenings found today among people who do not practice artificial deformation of any sort. However, in order to give the other point of view on this subject, the following statements of T. Dale Stewart are quoted:⁵

It may be admitted with Hooton, that the lambdoid type of deformity is difficult of explanation. Nevertheless, I am convinced that it is of an artificial nature. Unless some other explanation is forthcoming, the cultural implication seems to be that cradle-boards differing in type or with different accessories were in use in these two parts of the pueblo area (*i.e.*, Chaco area and southwestern Colorado). Since the few cradle-boards that have survived in the region concerned show few differences in the principles of construction, this assumption cannot be verified."

An attempt has been made to tie in the Gallina series with the morphological types set up by Hooton in his studies of the skeletal material from Pecos Pueblo. The results of this attempt indicate that the Gallina people, in certain characteristics, very closely approximate Hooton's "Long-faced Europeans" and "Pseudo-Alpine" types. Next in order of proximity came the "residual," "Large Hybrid," and "Plains" types. These comparisons were made on the basis of absolute means. Because of the similarities between the Pecos groups, themselves, on this basis, it is of even greater significance that four indices of the Gallina series most closely approach those of the "Large Hybrid" type. The use of the indices, representing proportions rather than the absolute measurements, seems of greater comparative value, and throws the Gallina series even closer to the "Large Hybrid" and "Long-faced European" types.

A composite photograph was made of the five best crania of the Gallina series and was compared with the composites of the various Pecos groups. This was found to most nearly approximate the composite of the "Large Hybrid" type, and thus affords additional evidence in support of the above conclusions.

This affinity of the Gallina series with physical groups commonly associated with the Plains rather than Southwestern tribes, causes the enlargement of the Gallina series to proportions of statistical validity to be eagerly anticipated. However, in spite of the regrettably limited amount of data, the homogeneity of the Gallina series is noteworthy.

VASSAR INAUGURATES FIELD SESSIONS IN ANTHROPOLOGY RUTH MACKAYE

During the summer of 1939, Vassar College began, under a five-year grant from the Carnegie Corporation, the first scientific survey

5. Stewart, T. D.: "Different Types of Cranial Deformity in the Pueblo Area," *American Anthropologist*, vol. 39, no. 1, 1937.