

COLLECTION: El Palacio Collection

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COMMENTS:

Reed discusses skeletal remains recovered during 1949 and 1950 under the direction of R. Gordon Vivian. Descriptions of each set of remains (cranial and post-cranial) including "deformations." Also includes comparison to other Southwest sites.

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Human Skeletal Material from Site 59, Chaco Canyon National Monument

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The collection which I attempt to describe in this report was recovered in the course of work during calendar years 1949 and 1950 under the Ruins Stabilization program carried on in Chaco Canyon National Monument by R. Gordon Vivian of the National Park Service. It was originally studied in the spring of 1951, and was rechecked in December 1955, after a review of similar material with T. D. Stewart of the U. S. National Museum.

A series of thirty-four burials, numbered from 59/1 to 59/37 (lacking Nos. 9, 25, and 26), representing at least thirty-eight individuals, comes from the site designated Bc59. This is a small Pueblo III ruin of about twenty rooms and five kivas, yielding pottery of Chaco 2 and 3 types and of the Mancos-McElmo group. It was partially excavated by Thomas W. Mathews for the University of New Mexico in 1947; clearing was completed and the ruin stabilized by Mr. Vivian during 1950. In the 1947 work, Mr. Mathews found a dozen burials; the skeletal material recovered went to the University of New Mexico.

This report will also include, as of special and comparative interest, a skeleton in good condition, virtually complete, from Room 82A of the great ruin Pueblo del Arroyo, found in the course of Mr. Vivian's stabilization project there, 1949-1950: a male adult. In the original partial excavation of Pueblo del Arroyo in 1927, seven burials were found, representing at least fifteen individuals (letter of July 31, 1950, from Dr. T. D. Stewart), which eventually will be published, presumably, in the Smithsonian Institution-National Geographic Society series of reports on the Chaco Canyon work directed by Neil M. Judd in the 1920's.

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Table 1—Listing of Bc59 Specimens

<i>Burial No.</i>	<i>Age</i>	<i>Sex</i>	<i>Condition</i>	<i>Burial No.</i>	<i>Age</i>	<i>Sex</i>	<i>Condition</i>
59-1	y. adult	F	g. except pelvis	19	child	F?	skull only
2	adv. adult	M	g. except legs	20	adv. adult	M	incomplete
3	baby		fair	21	adult & another	M?	both only partial
4	adv. adult	M	rather poor	22	y. adult	F	fairly food
5	child		rather poor	23	adult	F	fair except skull and pelvis
6	adult and child	?	few bones poor	24	adult	F	poor
7	adult	F	few bones	27	adult		poor, incomplete
8	y. adult	M	poor	28	child		few bones
10	adult	M	poor, no skull	29	baby		incomplete
11	child		poor, incomplete	30	adult	F	partial, no skull
12	child		fair	31	baby		fragm. skull
13	adult	F	rather poor	32	y. adult and baby	F	few bones fragm. skull
14	child		fair	33	adv. adult	M	poor, incomplete
15	child		fairly good	34	y. adult	F	fair
16	adult and child	M	few bones incomplete	35	y. adult	?	few bones
17	child		fair, incomplete	36	adolesc.		fair, incomplete
18	baby		fragm. skull	37	adult	F	good

TOTAL Bc59: 5 babies, 12 children, 8 male adults and 9 females, 4 indet. adults (6 young adults; no senile; 4 elderly).

Features of the Skull

As listed in full below in Table 2, all observable specimens, adult and infantile, manifest rather pronounced cranial deformation (artificial or unintentional cradleboard flattening of the back of the head) of the lambdoid type—i.e., at a high angle, not vertical occipital deformation. Two of these appear, however, to be intermediate in type, at an angle of only 15° or 20° from the vertical (instead of 30° to 40° as in typical lambdoid flattening: see Stewart, 1937, 1940), like one specimen from Mancos Canyon, Colorado, described by T. D. Stewart (Reed, 1958). These nevertheless may be considered as falling with the lambdoid style of deformation, characteristic of the San Juan Anasazi of Chaco Canyon and other districts of the northern Southwest (Reed, 1949). It is of interest to note that in the majority of observable instances, the flattening is asymmetric—uneven, tilted—to the left (11 cases). Only one from Bc59 is definitely to the right, and two are uncertain; there is only one which appears to be symmetrical. This predominance of asymmetry seems to be typical in the San Juan region. The skull from Room 82A, Pueblo del Arroyo, is also lambdoidally deformed, but only moderately, less than the average, with slight asymmetry to the right.

The Bc59 series is characterized by alveolar prognathism (protrusion of the jaws) and high-bridged noses, with narrow nasal alia; generally a strong nasal spine, and no marked nasion depression; the faces are moderately deep and wide, with rather shallow jaws but strong chins in most cases; the brow-ridges are generally weak and undeveloped. Convexity of

nasal profile is due to prominence and arching of the nasalia; only in one case, 59/37, is nasal overgrowth noted (Birdsell, 1951, pp. 58-59).

The Bc59 people resemble other Chaco Canyon skulls, Basket Maker skulls, the "Basket Maker" type of Pecos (Hooton, 1930) and the characteristic modern Zuñi type. Measurements of Bc59 adult crania listed in Table 4 below correspond generally to Southwestern norms. Examples are given in Table 5 for measurements which are considered to be virtually unaffected by artificial cranial deformation—face heights and dimensions of nose and eye sockets. (Stewart, 1940; Seltzer, 1944—most of the comparative figures are taken from these two sources).

Female 59-1 has an exceptionally short and quite broad face, euryproptic (total facial index 75.4) and euryene (upper facial index 46.3), but a quite narrow nose, almost leptorrhine.

The group may unhesitatingly be placed in the Southwest Plateau type (Seltzer, 1944) and compared to other series from the Chaco-Mesa Verde-Zuñi region, resembling particularly the Whitewater Creek skulls from Allantown, Arizona (Pueblo I-II, A.D. 800 and about 1000; described and illustrated by Stewart, 1940).

Table 2—Cranial Deformation

<i>Burial No.</i>	<i>Pronounced</i>	<i>Lambdoid</i>	<i>Asymmetry</i>
59-1	yes	yes	sl.l.
2	yes	yes	sl.l.
3	yes	yes	?
4	yes	yes	left
5	(fragmentary)	—	
child 6	?	?	right?
7	(no skull)	—	
8	?	yes	right?
10	(no skull)	—	
11	yes	yes	no?
12	yes	yes	left?
13	(fragmentary)	—	
14	yes	yes	sl. l.
15	yes	yes	?
child 16	yes	yes	?
17	yes	yes	right
18	(fragmentary)	—	
19	yes	yes	sl. l.
20	(fragmentary)	—	
21	(fragmentary)	—	
21b	(fragmentary)	—	
22	yes	yes	left
23	?	probably	?
24	(fragmentary)	—	
27	?	yes	?
28	mod.?	yes	?
29	?	probably	?
30	(no skull)	—	
31	(fragmentary)	—	
child 32	mod.?	probably	?
33	(fragmentary)	—	
34	not very	yes	left
35	(no skull)	—	
36	mod.?	probably	sl. l.
37	yes	yes	left

The comparatively tall youthful adult male from Pueblo del Arroyo (Room 82A) is notably different in certain features from the classical Chaco-Zuñi-Basket Maker type represented by the Bc59 series. His supra-orbital ridges are, for a Southwestern Indian, strong; there is considerable nasion depression; the nasal bones are broad and only moderately arched (i.e., not as aquiline as the others), but the nasal aperture is narrow; the nasal spine is not especially strong; the face is broad and short, with particularly wide and prominent malars (the bizygomatic diameter of 140 mm. is excessive). The degree of alveolar projection compares to or exceeds that of the Bc59 skulls. The lower jaw is not particularly large or deep, but rather wide-spreading; there is no flare of the gonial angles (not strong in the Bc59 series either); the chin is less developed than in the Bc59 mandibles. The orbits are chamaeconch, decidedly low but of average breadth. In general, skull 82A has a slightly "Australoid" or Ainu-like look, with a rather short and very broad face, comparatively well-developed brow ridges, marked nasion depression, and extremely low eye sockets. The nose is reasonably prominent. This individual falls below the normal Anasazi averages in face heights, nose measurements, and orbit height, but within normal ranges except for orbit height. The general appearance is Puebloan, as with skulls called "pseudo-Australoid" at Pecos and elsewhere, and the specimen may be considered as falling in the general Southwest Plateau racial type.

In comparison with the arbitrary morphological Pecos types (Hooton, 1930), the skull from Room 82A, Pueblo del Arroyo, falls below the means of both "Basket Maker" and "pseudo-Negroid" as well as "pseudo-Australoid" in minimum frontal diameter, and very close to the "pseudo-Australoid" means in bizygomatic diameter and face heights, total and upper. The nasal height and breadth are within the "pseudo-Negroid" and "pseudo-Australoid" ranges, lower than the means, while the nasal index is lower (narrower-nosed) and almost identical with the "Basket Maker" (Pecos type) mean.¹ The orbit height and mean orbital index of skull 82A are even lower than the extreme of the "pseudo-Australoid" range, by far the most chamaeconch of the Pecos morphological types. In fact, I have so far located no other Southwest Plateau male skull with orbits only 30 mm. or less in height.

1. These three "types," plus many or most of the other Pecos skulls, may all be considered as Puebloan and representing the Southwest Plateau racial type. Only at Pecos among published series of Pueblo Indian skeletons do there seem to be non-Puebloan types, presumably deriving primarily from Plains admixture.

Table 3—Other Cranial Observations (Adult Skulls)

Burial No.	Alveolar progn.	High-bridged nose	Strong Supraorbitals
59-1	yes	yes	no
2	no-orthogn.	yes	mod.
4	?	?	no
8	?	?	?
(child 12	yes	—)	
(child 14	yes	yes)	
19	mid-facial	?	no
21	yes		mod.
22	yes	?	no
23	?	?	no
24	yes	?	?
34	yes	?	no
37	yes	yes	no
P.A.-82A	yes	no	yes

Post-Cranial Skeleton

There are few special points of general interest aside from the calculation of stature given below. The long bones are fairly strong, though mostly smooth and slender, with well-developed muscle attachments in general, indicating muscular build, as is usual among the Southwestern skeletons and living Pueblo Indians. Humeri of female adults appear especially muscular, with a high degree of torsion, presumably developed by household activities such as grinding corn on the metate with handstones. The femora (14 adults) are only slightly bowed but strongly pilastered. Observable tibiae are straight, without marked retroversion of the heads.

Occurrence of two cases of septal apertures of the humerus (perforated olecranon fossa; a small opening through the lower end of the humerus, in the socket for articulation of the ulna at the elbow), in a series of 18 adult individuals the bones of whose upper arms are present, is slightly unusual, especially as both are males (the Pueblo del Arroyo skeleton "82A" and 59-4), though with no special significance. This phenomenon usually occurs more often in females, permitting hyperextension of the supinated forearm (ability to bend the lower arm the wrong way, downward from the elbow with the hand held palm up.) At Pecos, "perforation of the septum between the olecranon and coronoid fossae is commoner in the females than in the males, and commoner on the left side in both sexes" (Hooton, 1930, p. 170).

The frequencies of this condition in Pecos skeletal material are: males—8½% right, 16% left; females—26% right, 30% left; it occurs in about 12% of males and 28% of females among Basket Makers. In the Allantown (Whitewater Creek) series, attention is called to the large number of perforated olecranon fossae—in four of ten males and ten of seventeen females (Stewart, 1940, p. 161).

Table 4—Facial Measurements (Adults Only)

Burial No.	Minimum Frontal Diameter	Bizygomatic Diameter	Face Height		Nose Height	Nose Breadth	Nasal Index	Mean Orbital		
			Total	Upper				Height	Brdth.	Index
MALES:										
Bc59-2	98.5	139	113	69	48	25	52	35	39	89.7
4	—	—	(68)	—	50.5(?)	—	—	—	—	—
P.A.-82A	91.0	140	115	67	47	24	51	30	38	78.9
FEMALES:										
Bc59-1	92	138	104	64	49	23	46.9	33	39	83.5
22	88	—	123	76	?	27	—	—	—	—
34	—	—	110	64	?	25	—	36	38	94.7
37	102	134	125	72	51	27	53	36	41	87.5
Means	93.8	—	115.9	68.8	—	25.25	—	34.66	39.2	88.6

Table 5—Comparative Facial Measurements

Burial No.	Minimum Frontal Diameter	Bizygomatic Diameter	Total	Upper	Nose Height	Nose Breadth	Nasal Index	Height	Brdth.	Index
MALES:										
Bc50-Bc51 series (Kluckhohn, 1939)										
Chaco Canyon series			123	72	48-52	26	52.1	35	40	85.3
Allantown, Ariz. series		Mean	117	71	51.7	24-28	50-57	31-37	37-42	79-90
Range		Range	114-123	69-73	50	25	48.6	35	38	91.8
8 fr. Southwestern Colorado			121	71	47-52	24-27	50	34	38	89.6
Mancos Canyon No. 11/2			—	—	50	26	52.9	34	39	86.3
Hawikuh, incl. undef.			121	72.5	52	28	53.8	36	40.5	88.9
Undef. Basket Makers, Utah			121	74	51	25	49.2	35	38	92.2
Undef. Basket Makers, Ariz.			116	73	51	25	49.3	35	38	91.3
Swarts Ruin (Howells in Cosgrove, 1932)			116.4	71.6	51	25	50.1	34	39	87.5
Mean		Mean	112-124	68-78	49.7	27.3	52.4	34	40	86
Range		Range	—	—	47.54	25-30	47-57	32-36	37.5-42	80.92
FEMALES:										
Chaco Canyon series			114	67	49	25	50.7	34	38	89.2
Allantown, Ariz. series		Mean	114	69	48	24	50.3	33	36	90.3
Allantown, Ariz. series		Range	109-117	67-73	44-53	22-26	45.3-56.8	—	—	—
Southwestern Colorado			116	68	49	24	49.6	34	38	89.0
Mancos Canyon No. 3/1			—	65	49	25	51.0	31	35	88.6
Hawikuh, incl. undef.			113	68	48	25	52?	34	37	93.7
Undef. Basket Makers			113	68	48	25	51.4	34	37	90.0
Swarts Ruin (Mimbres)		Mean	110	66.25	47.7	25	53.2	33.5	37.75	87.9
Range		Range	—	60-73	43-50	74-26	51-58	31-36	36-41	85.94

The bones of the torso yield no features of special interest, aside from indications of arthritis, as mentioned below under pathology, except that 59-1 (young adult female) has six lumbar vertebrae,² an unusual or even rare condition but not unheard of in Southwestern Indian material (see Reed, 1957), and male 59-2 has the second and third cervicals fused. No items of importance, aside from age and sex criteria, were noted in the shoulder girdle and pelvis.

Table 6—Stature

	<i>Length of Femur</i>	<i>Length of Tibia</i>	<i>Pearson¹ Femur and Tibia</i>	<i>Approximate Height</i>
<i>Males</i>				
59-2	44.2	36.2	164.5	5'4½"
59-4	(39.5+)	(33.5?)		
P.A. (82A)	46.0	38.3	168.5	5'6"
<i>Females</i>				
59-1	39.8	33.3	151.5	4'11½"
59-22	40.2	33.1	151.7	5'
59-37	41.0	33.7	153.3	5'¼"

¹Pearson, 1898, formulæ for reconstruction of stature from long bones:
 males: cm. 71.27 plus 1.159 (femur plus tibia)
 females: 69.154 plus 1.126 (femur plus tibia)

The two males, at 5'4" to 5'6", are slightly taller than average; but statures of approximately five feet for the three females are typical, close to Pueblo averages and archeological Southwest Plateau type. Other individuals, the lengths of whose femora could be estimated, but not measured accurately enough to justify their inclusion in Table 6 above, evidently fall within the same range. The little old man 59-4 is obviously much shorter than the usual male norm, not over 5'1½".

Table 7

	<i>Femur Length</i>		<i>Tibia Length</i>		<i>Pearson—cm.</i>		<i>Approx. height</i>	
	<i>Males</i>	<i>Females</i>	<i>Males</i>	<i>Females</i>	<i>Males</i>	<i>Females</i>	<i>Males</i>	<i>Females</i>
Allantown	42.0	39.1	34.6	32.2	160	149.5	5'3"	4'11"
Pecos	42.4	39.2	35.8	32.7	161.9	150.1	5'4"	4'11"
Hawikuh	42.4	38.9	—	—	—	—	5'4"	4'11"
Basket Maker	43.0	40.0	37.2	34.1	164.2	152.6	5'4"	5'
Swarts Ruin					162.15	154.6	5'4¾"	5'

(Calculated from individual bones)

The extremes in known Southwestern material are two Arizona specimens at the U.S. National Museum, a male from Elden Pueblo near Flagstaff, with a femur 49.6 cm. long, indicating a stature around 5'9", and a female from Stone Axe Pueblo (just east of the Petrified Forest),

2. Noted by Dr. T. D. Stewart, letter of 29 January 1962.

with a femoral length of 34.7 cm., giving a stature of about 4'6" (letter of March 12, 1951, from T. D. Stewart).³

Pathology

Arthritic lipping and exostoses are present on lumbar vertebrae of two males and three females (two elderly, one young girl), and on the distal ends of the radii of one of the males. No other definite evidence of disease was observed although possible indications of osteoporosis were noted on a few crania; loss of teeth and other dental troubles are discussed above in connection with the skull.

A cut-out place 20 mm. long on the right parietal of adult male from Pueblo del Arroyo (Room 82-A) looks pre-mortem, rather than administered in finding; and a smaller cut on the left portion of the frontal might also be. These do not represent fracturing blows with the traditional blunt instrument, they are not in the right locations to have any connection with scalping, and they do not closely resemble trepanation.

3. An even shorter female, unpublished as yet, was recovered in 1956 in the excavation, as a Highway Salvage Project of the Museum of New Mexico, of LA 3333, a small Santa Fe-Galisteo Black-on-white site in the Galisteo Basin 26 miles south of Santa Fe. The reconstructed stature of this specimen, on the basis of a r. femur 340 mm. long and a r.tibia 275 mm. long, is calculated as 4'6½" (Reed, ms.).

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