APPENDIX A
Faunal identifications, site SJo-68[1]

	Age			Axial		
	Unknown	Adult	Juvenile	Skeleton	Skull	Appendage
Cervus nannodes	1	41	1	4	12	26
Cervidae (spp?)		6			3	3
Antilocapra americana		26	1	7	1	19
Odocoileus sp.		24		4	3	17
Artiodactyl sp.	1	8		5		4
Phalacrocorax		3				3
Anas sp.		10		2		8
Fulica americana		4		1		3
Grus canadensis		1				1
Branta canadensis		1				1
Goose (spp?)	2	9		1	0	10
Anser albifrons		5		2		3
Anas platyrhynchos		2				2
Cygnus sp.		1				1
Falco		2				2
Cathartes aura		1				1
Corvus corax		1				1
Corvus brachyrhynchos		2				2
Corvus (sp?)		4				4
Canis (coyote)		18		3	3	12
Ursus sp.		1		1		
Castor canadensis		9		1	8	
Procyon lotor		16		1	7	8
Lutra canadensis		2		1	1	
Taxidea taxus		2			1	1
Mephitis mephitis		1			1	
Dipodomys heermanni		2			1	1
Thomomys bottae		2			2	

[1] Information supplied by E. L. Perry.

	Age			Axial		
	Unknown	Adult	Juvenile	Skeleton	Skull	Appendage
Lepus californicus		31		8	3	20
Sylvilagus auduboni		10		2		8
Citellus beecheyi		10			5	5
Mylopharodon conocephalus		3			3	
Gila crassicauda		4			4	
Clemmys marmorata	2			2		
Buteo sp.		1				1

APPENDIX B

Statistical Technique for Collating Burial Information[1]

In order to analyze the data statistically, a generalized statistical computer program was used.[2] In this report a sample is a group of burials with a common characteristic such as being of a given depth or excavated by a given person. A variable is any data item recorded about a burial such as position of burial, type of burial, or number of a given kind of artifact.

Only parts of the data produced by the program were useful for this problem. Within each sample, the number of associations of every pair of variables was listed. Between samples, the standard statistical tests for comparison of variables were used to determine whether there were significant differences made. Because a given variable was recorded in only a small number of burials the t-test was considered in preference to the normal test. The t-test is meaningful only for variables for which normality and a continuous distribution would be assumed. The following variables do not meet this criterion: position of burial and sex of the individual. The F-test which compares the standard deviation of two samples was made to check meaningfulness of t-test results since the latter is invalid if the standard deviations of the two samples compared are markedly different. Differences with a significance level of 5% or 1% in both the t- and F-tests were noted on the output together with the values of these tests and the number of degrees of freedom.

Calculations in the program were made in floating point arithmetic accurate to eight significant digits except where the differences of large sums were taken in which case double precision was used to obtain sixteen significant digit accuracy. The significance levels of the t- and F-tests are determined by interpolation between points of a table sorted internally within the program. Any error of interpolation tends to be on the conservative side; i.e., a significance level of 5% or 1% may be missed. In doubtful cases, there is enough information given in the output to consult significance tables.

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[1] This Appendix written by Tom Rich, Department of Paleontology, University of California, Berkeley.

[2] Alicia Ewing, "A General Computer Method for Statistical Analysis of Data," Semi Annual Report, Biology and Medicine, Donner Laboratory and Donner Pavilion, Lawrence Radiation Laboratory, UCRL-11833, Fall 1964, University of California, Berkeley.

VARIABLES: key to computer analysis, (based on Heizer, 1947).

1. Extended ventral west - E V O	I-1
2. Extended ventral other - E V O	I-2
3. Extended dorsal west - E D W	I-3
4. Extended dorsal other - E D O	I-4
5. Extended side west - E S W	I-5
6. Extended side other - E S O	I-6
7. Flex west - FLEXW	I-7
8. Flex other - FLEXO	I-8
9. Artifacts in shoulder and neck reg - S NREG	I-9
10. Mid body section - MIDBOD	I-10
11. Pelvic region and upper legs - PELREG	I-11
12. Around lower legs and feet - LOWLEG	I-12
13. 0-11"	I-13
14. 12-23"	II-1
15. 24-35"	II-2
16. 36-47"	II-3
17. 48-60"	II-4
18. I (0-6 yrs) - STGI	II-5
19. II (6-12 yrs) - STGII	II-6
20. III (12-21 yrs) - STGIII	II-7
21. IV (21-50 yrs) - STGIV	II-8
22. V (50+ yrs) - STGV	II-9
23. Male - MALE	II-10
24. Female - FEMALE	II-11
25. Baked clay objects; smooth frags. and balls-BCOFRG	II-12
26. Baked clay objects; pecan, bi-conical and discs (perforated) BCOPEC	II-13
27. Antler artifacts - ANTART	III-1
28. Birdwishbones - BWISHB	III-2
29. Bird talons/animal claws - CLAWS	III-3
30. Bone Tubes - BTUBES	III-4
31. Misc. bone artifacts; turtle shell fishhooks, unidentified worked bone chisel - MISCB	III-5
32. Animal teeth - ATEETH	III-6
33. Awls - AWLS	III-7
34. Charmstones A3-CHSA3	III-8
35. " B1/B1b - CHSB1	III-9
36. " B2-CHSB2	III-10
37. " B3-CHSB3	III-11
38. " B4-CHSB4	III-12
39. " C1/C2/C3 - CHSC1	III-13
40. " frags, and unfinished-CHSFRG	IV-1

APPENDIX C

Sex and Age Determination of Individuals from SJo-68[1]

The determination of sex was in all cases made by direct observations of a few features. Whenever possible the pelvic bones were used and took precedence in the determinations. The most important of the diagnostic features of the pelvis are the sciatic notch (broader and shallower in females), the pre-auricular sulcus (more consistently present in females), and the superior aperture (larger and more circular in the female).

In many cases the skull was all that was available for sex determination. The features used in these cases were the general robustness, muscular processes, supra-orbital ridges, external occipital protuberance, flare of the gonial regions of the mandible, and the squareness of the mental region of the

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[1] Information supplied by J. D. Cadien.

mandible--all of which are greater expressed in the male. The reliability of these features is less than those of the pelvis, so in cases of uncertainty the individual is considered sex unknown. No attempt was made to sex non-adult individuals for sex differences in the skeleton are much less in non-adults.

The determination of age was made by the sequence of tooth eruption in non-adults, using the stages set by Sour and Massler (1941). Also the fusion of the basi-occipital with the basi-sphenoid occurs at 17-20 years. Determination of the age of adult skeletons was more difficult. The closing of the cranial sutures was not used. The degree of dental attrition, loss of teeth and reabsorption of the alveolar bone, and the increase in the gonial angle were used in conjunction, making the age class of the individual reasonably certain (Sour, I., and M. Massler, 1941).

Catalog Number	Burial Number	Sex	Age	Years	
12-5824	1	2 males	old persons	40-50	
12-5825	2	1 female	old person	40-50	
12-5826	3	1	infant	2-3	
12-5827	4	1 male	adult	21-45	
12-5828	5	1 female	adult	21-45	
12-5829	6	1	child	6-12	
12-5830	7	1	early childhood	6-8	
12-5831	8	1 male	adult	21-45	
12-5832	9	1 female	mid - late adult	39-45	
12-5833	10	1 male	late adult	40-45	
12-5834	11	1 male ?	adult ?	21-45	
12-5836?	12	1			no card
12-5835?	13	1	mid-adolescence	15-18	
12-6470	14	1	adult	21-45	
12-6471	15	1 female	adult	21-45	
12-6472	16	1 female, 1?	adult and infant	21-45	
				4-6	
12-6473	17	1 male?	adult	21-45	
12-7565	18	1 ?	infant	2	
12-7566	19	1 female	adult	21-45	
12-7567	20	1 female	adult	21-45	
12-7568	21a	1 male	adult	21-45	
12-7569	21b	1 ?	adolescent	12-21	
12-7570	22	1 female	late adolescent	19-21	
12-7571	23	1 male	late adolescent	19-21	
12-7572	24	1 male	early adult,	21-25	arrow in
		1 male ?	late adolescence	19-21	pelvis

Catalog Number	Burial Number	Sex	Age	Years	
12-7573	25	1 ?	late adolescence	19-21	
12-7574	26	1 male, 1 ?	2 adults	21-45	
12-7575	27	1 female	adult	21-45	
12-7576	28	1 male	young adult	21-25	
12-7577	29	1 female ?	early adult	21-28	
12-7578	30	1 ?	old person	50 or more	
12-7580 79	31	1 female	adult	21-45	
12-7579 80	32	1 ?	infant (foetal?)	0	
12-7581	33	1 female	old person	45-50	
12-7582	33a	1 male	adult	21-45	
12-7583	33b	1 male ?	adult (very lage)	21-45	
12-7584	33c	1 female	adult	21-45	
12-7585	33d	1 male, 1?	adult, old person	21-45, 50 or more	
12-7586	34	1 female	old person	50 or more	
12-7587	35	1 ?	child	6	extra tooth in palate
12-7588	36	1 ?	adult	21-45	on loan
12-7589	37	1 male	late adult	45	very large acromegaly
12-7590	38	1 female	old person	50 or more	
12-7591	39	1 male	adolescence	18-21	
12-7592	40	1 female	mid-adolescence	16-18	
		1	infant	0-6	
12-7593	41	1 female	old person	45-50	
12-7594	42	1 male ?	late adolescence	17-21	
12-7595	43	1 ?	infant	1	
12-7596	44	1 male	old person	40-50	
12-7597	45	1 male	end adolescence	19-21	
12-7598	46	1 female	adult	21-45	
12-7599	47	1 male	adolescent	18	
12-7600	48	1 male	old person	50 or more	
12-7601	49	1 male	adult	21-45	fused cervical vertebra
12-7602	50	1 ?	infant	0-6	
12-7603	51	1 male	adult	21-45	
12-7604	52	1 male	adult	21-45	
12-7605	53	1 male ?	old person	45-50	very small
12-7606	54	1 female	adult	21-45	
12-7607	55	1 male ?	old person	45-50	skull lesions
12-7608	56	1 ?	mid-adolescence	16	
12-7609	57	1 ?	young child	6	
12-7610	58	1 male	adult	21-45	
12-7611	59	1 ?	infant	4.5-6	
12-7612	60	1 male	adult	21-45	
12-7613	61	1 male	adult	21-45	

Catalog Number	Burial Number	Sex	Age	Years	
12-7614	62a	1 male	adult	21-45	
12-7615	62b	1 ?	late adult	45	
12-7616	62c	1 ?	adult	21-45	
12-7617	63	1 ?	child	10	
12-7618	64	1 male	old person ?	50	
12-7619	65	1 ?	child ?	6-12 ?	
12-7620	66	1 female	adult	21-45	
12-7621	67	1 male	adult	21-45	
12-7622	68	1 female	adult	21-45	2 lumbar vertabra fused
12-7623	69	1 female	early adult	21-30	
12-7624	70	1 male	early adult	21-25	
12-7625	71	1 ?	infant	< 1	
12-7626	72	1 male	adult	21-45	
12-7627	73	1 ?	infant	0-6	
12-7628	74a	1 ?	child	10	
12-7629	74b	1 male	adult	21-45	
12-7630	75	1 ?	adult	21-45	
12-7631	76	1 ?	Infant	0-6	
12-7632	77	1 male, ?	adult	21-45	
12-7633	78	1 ?	child	8-9	
12-7634	79	1 male	adult	21-45	
12-7635	80	1 ?	infant	1	
12-7636	81	1 ?	child	6-7	
12-7637	82	1 female	old person	50 or more	
12-7638	83	1 ?	old person	45-50	
12-7639	84	1 male	early adult	21-25	
12-7640	85	1 male	adult	21-45	generally huge
12-7641	86	1 female	late adult	40-45	
12-7642	87	1 ?	infant	1	
12-7643	88	1 female ?	mid-adolescence	16-17	
12-7644	89	1 ?	end adolescence	19-21	
12-7645	90	1 female	adult	21-45	
12-7646	91	1 male	adult	21-45	
12-7647	92	1 ?	infant	0-6	
12-7648	93	1 female	old person	45-50	
12-7649	94	1 ?	adult	45	
12-7650	95	1 male ?	adult	21-45	
12-7651	96	1 male	old person	50 or more	
12-7652	97	1 male	adult	21-45	
	98	1 ?	infant	0-6	
	99	1 ?	adult	21-45	
	100	1 ?	foetal	0	
	101	1 ?	adult ?		
	102	1 ?	adult ?		

Catalog Number	Burial Number	Sex	Age	Years
12-8020	103	1 male ?	adult	21-45
12-8021	104	1 ?	adult	
12-8022	105	1 male ?	adult ?	
12-8053	106	1 male	adult	21-45
12-8023	107	1 female	adult	21-45
12-8024	108	1 female	adult ?	
12-8025	109	1 ?	?	?
12-7285	110	1 male	adult	21-45
12-7329	111	1 female ? 1?	2 adults	21-45
12-7328	112	1 female	late adult	40-45
12-7327	113	1 female ?	late adult	40-45
12-7330	114	1 male ? 2?	3 adults	21-45
12-7674	Cremation #1	several individuals probably adult		
12-7675	Cremation #2	1 individual	probably adult	
12-7676	Cremation #3	1 individual	adult	
12-7677	Cremation #4	1 individual	adult?	
12-7678	Cremation #5	1 male ?	adult	

APPENDIX D

Windmiller Culture Charmstone Typology
(Revision of Lillard, Heizer and Fenenga 1939)
The typology is shown in Figs. 16-18.

A: "Spinner." Normally schist (1 marble).

A1: "Full Spinner." Pronounced central bulge; often long; always schist.

A1a: Disc-shaped bulge; very flat cross section; usually very long, includes longest Type A specimen. Pecked and asphalted binding groove normal at Sac-107; absent at Sac-168. One notched tip at Sac-107 (relates to C2).
T.S. = L16654.* Sec-107. Note: Type E2 (phallic) should be related to A1a.

A1b: Reduced bulge; flat oval cross section; length, long to very long. Body on both sides of bulge is narrower than A2. Often lacks binding groove (though may be roughened).

A1b1: Long to very long, narrow projections above and below bulge; one notched tip at Sac-107. Dominant type at 168; Sac-107 = 2; SJo-56 =1.
T.S. = L12560 Sac-107.

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* T.S. means Type Specimen. Numbers prefixed with L are in the Lillard Collection in Lowie Museum of Anthropology. Numbers prefixed with 1- are LMA catalogue numbers.

A1b2: long, wider projections above and below central bulge. Limited to Sac-107 (3 spec.) T.S. = L16948, Sac-107.

A2: "Modified Spinner." Slight bulge; medium to long in length; usually shorter than A1, with broader body on either side of bulge. Always schist.

A2a: Slight bulge is still obvious, medium to long in length.

A2a1: Usually long (two very long); flat oval cross section. Narrow pecked binding groove (often with traces of asphalt) is normal. Common at Sac-168, followed by Sac-107. T.S. = 1-46348, Sac-107.

A2a2: Medium; oval cross section. No pecked binding groove. Limited to Sac-107 (fall fragments: 2 = tip, 1 = end). T.S. = 1-46531, Sac-107.

A2b: Slight bulge is barely noticeable; broader than A2a. Medium length, shorter than A2a1; larger than A2a2. Flat oval cross section. Sac-107 = 6; Sac-158 = 1. T.S. = 1-46524, Sac-107.

A3: "Reduced Spinner." Medium to long in length. No central bulge although slight thickening is often apparent. Normally schist. (1 marble).

A3a: Extremely long. Unique specimen, of marble, which has the "feeling" of Type A, but may well represent an extremely long B1a3. T.S. = only specimen: 1-133919, Sac-168.

A3b: Long, relatively narrow. Flat oval to oval cross section. Sac-107 = 5; Sac-168 =1. T.S. = L 12526A, Sac-107.

A3c: Medium length, relatively broad; very flat cross section; tip may be grooved (1-133943, Sac-168). Sac-107 = 4; Sac-168 = 2. T. S. = L12557A, Sac-107.

A4: "Incipient Spinner."

A4a: Medium length, bare trace of central bulge, pointed end (shared with A5). Oval cross section. Schist. Single specimen = 1-46322. Sac-107.

A4b: Medium length, slight but definite central bulge; probably pointed end. Perforation placed extremely far from tip (relates to Type C). Oval cross section. Schist. Single specimen = 1-46235, Sac-107.

A5: "Pencil." Medium length, pointed end, notched tip (relates to C2). Oval cross section. Variant schist. Single specimen = 1-73408, SJo-68.

B. This group is not an historical assemblage, and must eventually be revised.

B1a probably represents 2 traditions: one = B1b, and the other is a valid group (including A3a) derived perhaps from Type C or Type B2 (which belongs with Type A).

B1b probably represents a long-lived tradition, with possible sequence: B1b1, B1b2 (with the long B1a1 type), B1b3, B6, (?B7).

B2 probably belongs in the A group (between present A3 and A4). It is a valid type.

B3 is a valid type; may be distinct invention, a foreign type, or B2 derivative.

B4 is a valid type, but probably belongs in revised B1a group - related to the medium B1a1's and B1a2.

B5 is merely a descriptive category for all miniatures.

B6 and probably B7 may be final Windmiller variants of B1b3.

B1a: Dominant type at SJo-56. While Bulletin 2 shows the cross section as round, the specimens vary from round to flattened oval. Length also is extremely variable, medium to long. Normally made of marble, but rare specimens of diorite and schist occur. The single Bulletin 2 sub-type has been divided into 3 types, but B1a1, in fact the whole B1a, B2, A3c complex needs further revision.

B1a1: Very long to medium; narrow relative to other B1a types. Always round cross section. Tips and ends always flattened. One notched tip. Normally marble; 1 diorite. Dominant type at SJo-56 (6 specimens). Occurs throughout SJo-56 E, with 1 occurrence in 56 D. Also 1 occurrence (medium) at Sac-168. T. S. (long) = L19161, SJo-56 (may be shifted to B1b variant). T. S. (medium) = L19213, SJo-56. (See B5a for possible miniature.)

B1a2: Medium length, 1 short. Oval cross section. Tip normally flat, ends flat to round. Normally marble. Broader than B1a1. May be derived from Type C. Type B4b may be merely a small variant of this type. SJo-56 = 4; Sac-168 =1 (smallest). T.S. = L19267, SJo-56.

B1a3: Medium to short. Widest and flattest of B1a, but still oval cross section. Tips and end usually flattened. Normally alabaster, but schist specimens occur at Sac-168 and Sac-107. Type B2 and A3c may also be variants of this type. SJo-56 = 1; SJo-68 = 1; Sac-107 = 1; Sac-168 = 2. T.S. = L19266, SJo-56.

B1b: "Biconical."
Straight to concave sides (rarely convex in contrast to B1a) with distinct angularity at midpoint (often a distinct shoulder in B1b3) in contrast to B1a.

B1b1: "Pointed Biconical."
Very long and narrow relative to other B1b's. Distinguishing traits include both the pointed (or narrow round) end, and the perforation placed far from tip. The central bulge is rounded - never shouldered (B1b1 is the least "biconical" of the group). Always round cross section. Tip flattened. Varied materials (schist, rhyolite).
3 specimens:

Sac-107 = 1	T.S. = L16656	
SJo-68 = 1	T.S. = 1-73455	Reused - groove after tip broke.
Sac-46 = 1		

B1b2: "Long Biconical."
Concave to straight sides, with distinct angularity at midpoint. Perforation shifts close to tip, unlike B1b1 but

similar to B1b3. End flattened. Always round cross section. All specimens are mottled serpentine. 4 specimens limited to Sac-168. T.S. = 1-133923.

B1b3: "Short Biconical."
Straight to concave sides with distinct shoulder at midpoint. Always medium to short relative to B1b2. Normally round cross section. (Defects may be left unground on one side in order to achieve this, rather than produce an oval cross section by complete grinding). Tip flattened, end flattened or rounded. Variable materials: mottled limestone and gabbro most common; also black schist, sandstone. (Never marble or blue schist.) 30 specimens - excellent horizon marker for Late Windmiller.

Sac-107 = 12
SJo-68 = 8 T.S. = 1-55329
Sac-168 = 7
SJo-142B = 2
SJo-56D = 1

Type B5a may represent a miniature of this type (or, less likely, B1a1). (Speculation: progressive change in a single historical type may be represented, with B1b1 ancestral to B1b2 which may be ancestral to B1b3 (C1 is an alternative for the latter). B6 and possibly B7 may be derived from B1b3.

B2: "Lenticular." (1 medium length)
Usually short with flattened oval cross section. Widest at mid-point (face view) - broad, squat shape in contrast to the elongate shape of B1a and the narrow bipoint of C. Tip rounded (rarely flattened). End rounded. Occasional pecked binding groove relates type to A, where it probably belongs. Usually blue schist (rare igneous and metamorphic; no marble specimens). Common at Sac-107, where it lasts through several phases. T.S. = L16285. Sac-168 = 1. (This type plus a single E2, are the only Delta types found in the Berkeley phase variant of the Windmiller tradition on San Francisco Bay at Ala-307).

B3: "Diamond."
Always short, (65-118 mm) with more marked angularity at the mid-point (face-view) than in B2. Also distinguished from B2 by the thick, rectanguloid cross section. Sides straight to convex. Tips and ends usually flattened (rarely rounded). Of 10 specimens, 9 are of dunite (veined serpentine); 2 from Sac-107 are of speckled serpentine. Total: 11; Sac-107 = 10 T. S. = L16280 Unperforated (probably unfinished; 2 have incipient perforations). SJo-68 =1 T.S. = 1-55324 perforated. Good horizon marker for late Windmiller; found with B1b3 at Sac-107 and SJo-68.

B4: (Probably a small variant of "Elongate" B1a.) Small, short (83-115 mm); elongate shape with convex sides; relatively narrower than B1a, lacking the marked mid-point width of B1a3. Tip flattened. End flattened, round or pointed. Total of 5 specimens, all of marble.

B4a: Round cross section. Total of 3: Sac-107=1, Sac-168=1, T.S.=1-133945, SJo-142=1.

B4b: Oval cross section. Total of 2: SJo-68=1, SJo-56D=1, T.S. = L19271. Both B4a and B4b are good late Windmiller horizon markers.The variable cross-section has no temporal significance.

B4: "Miniature." (28-56 mm. long). Heterogeneous group sharing only their very small size. It is probable that they are miniatures of larger types, but their shapes are too indistinct to be certain of the larger type, hence they are lumped together. Slender, elongate shape with little thickness at the mid-section. Tip may be pointed or flattened; end usually pointed. Variable materials: 3 marble, 3 soapstone, (1 from Ala-307 on San Francisco Bay is schist).

B5a: Round cross section; tip pointed. (28, 33 mm. long). Total of 3 specimens from 1 burial at SJo-56D. T.S. = L19254. Shape is that of C1 (absent from SJo-56). If pointed tip and end are ignored, specimens could be miniature B1b3 or B1a1.

B5b: Oval cross section. Shape is closest to B4b, followed by B1a3. Flat tip, pointed ends. Length between 28 and 56 mm. All 3 specimens are marble. SJo-68 =2, T.S.= 1-73450, SJo-56 =1, T.S. = L 19169. Both variants are good horizon markers for Late Windmiller; there are suggestions of two subphases, and SJo-68 B5b specimen would be earlier than the remaining 5 specimens.

B5c: One specimen from Ala-307, Alameda province on San Francisco Bay, has a round cross section, biconical shape with flattened ends resembling an exaggerated B1b3 (absent at Ala-307) made of local schist. Not illustrated; included merely to indicate that miniatures are limited to the Delta (as well as to indicate the problem of identifying the larger form intended.)

B6: "Bulbous." Short (75-85 mm.), fat; convex sides with maximum thickness at mid-point. Lacks the marked angularity of B1b. Shaping is less carefully done than B1b, so the normally round cross section is slightly asymmetrical. Grinding facets may remain. Tip and end slightly flattened. Perforation close to tip. Asymmetry and flattened end and tip distinguish type from C1c. Variable materials: mottled serpentine, micro-crystalline stone. Possibly derived from B1b3. Total of 3: SJo-112 =1 T.S. = Marino Col., Olsen and Wilson, 1964, Fig. 5c. Sac-107 =1 unassociated specimen (misidentified as Type B1a). Horizon marker for Terminal Windmiller.

B7: "Off-center." Medium sized (119, 126, 134 mm. long); convex sides with maximum thickness toward the perforated tip rather than mid-point. Angularity not pronounced. Shaping often careless, with tendency to asymmetry. Tip and end usually flattened. Variable placement of perforation, but placed relatively close to tip. Variable material: marble, mottled serpentine, fine-grained-granite. Possibly derived from B1b3. Total of 3 found with 1 burial at SJo-112. T.S. = Marino Coll., Olsen and Wilson,

1964, Fig. 5b (Misidentified as type B1a). Horizon marker for Terminal Windmiller.

C: "Bipointed."
Short to medium length (79-165 mm; 1 long = 180 mm). Sides convex with no trace of angularity (except C1d). Round through oval to flattened oval cross section. Termed "bipointed" because tips and ends are usually much narrower than B1b. While ends are often pointed, both rounded and slightly flattened variants occur. Tips are usually flattened in the plain variant, or have notches or grooves diagnostic of their type. Placement of perforation is variable, but is usually far from the tip in the longer specimens. Variable material, with emphasis on softer minerals (esp. marble and claystone; also mottled and special serpentines, rarely gabbro; never blue schist). Most of this group, dominant at SJo-68, is clearly a related assemblage and can be divided into three types on the basis of tip treatment: plain (1), notched (2) and grooved (3). Two additional types, channeled (4) and beveled (5) have been included but are less clearly part of the assemblage, as discussed under each type below.

When the length of the SJo-68 measurable specimens of types C1-C3 are plotted, a tri-modal curve results having no relationship to the 6-fold division presented for all charmstones. Available data suggest temporal differences are reflected in some instances, so the following special length divisions represent subtypes within C1, C2 and C3. (Too few specimens of C4 and C5 exist to merit this division, and other shape factors will be used for C4 divisions). C1, C2, C3 sybtypes based on length:

A: long: 180-136 mm.
B: medium: 103-111 mm.
C: short: 100-79 mm.
D: medium: 111-132 mm.

Relative width <u>increases</u> as length decreases in all 3 types (in contrast to B1a and B4). Type C1 has a fourth shape division absent in other types.

C1: "Plain Bipointed."
Simple tip; occasional specimens in all three size groups may have a narrow, beveled strip running between the tip and perforation on both faces (never found in B1b). Placement of perforation varies by size group. Tip flattened. End pointed or slightly flattened (always narrower than in B1b). Nearly round cross section. Width and thickness usually vary by 3 to 5 cm. (except C1c, C1d, which are usually round). C1 thus varies from C2 and C3 which usually have oval cross sections. Convex sides (except C1d) distinguish type from B1b3. Variable materials.

C1a: Long (137-159 mm., average 150).
Nearly round cross section in contrast to C2a, C3a. Perforation placed at intermediate distance from tip relative to C2a, C3a (far from tip) and B1b3 (close to tip). End pointed (3 specimens

or slightly flattened (1 specimen). Distinguished from B1b3 by length, convex sides, perforation placement, cross section, narrower tip and end, and beveled tips (2). Variable material: 2 mottled serpentine (1 may be gabbro), 1 special serpentine, 1 greenish-black schist. Total of 4: SJo-68 = 4 T.S. = 1-73466 Possible horizon marker for earlier subphase of Late Windmiller.

C1b: Medium (Sjo-68 = 103-106, average 104 (3 spec.) Sac-168 = 125) Nearly round cross section. Perforation placed close to tip in contrast to C2b, C3b. End flattened (4) or pointed (1). Tip flattened. One has beveled strip and another has traces of asphalt running between perforation and tip. Distinguished from B1b3 by convex sides and cross section. Variable material: SJo-68 = 3 mottled serpentine; Sac-168 = 2 andesite ? Total of 7: SJo-68 = 3 T.S. = 1-73467
Sac-168 = 2 (1 uncertain fragment)
Sac-46 = 2 (132 mm. long, 133 mm. long)
Possible horizon marker for earlier subphase of Late Windmiller. Probable ancestor of B1b3 (if latter is not merely a reduced variant of B1b2).

C1c: Short (83-93 mm., average 88 mm.4 spec.) with Sac-46: 81-93 mm, average 87 mm. 5 spec. Oval to round cross section. Perforation placed close to tip. One specimen has incipient perforation (Sac-107). End pointed. Tip flattened or pointed; one has beveled strip between perforation and tip (SJo-68). Distinguished from B6 by pointed end and better finish (fully symmetrical). Variable material: 2 mottled serpentine (SJo-68, Sac-107); 1 gabbro (Sac-168); 1 granite (Sac-107). 1 unknown Sac-46). Total of 4: SJo-68 = 1 T.S. = 1-73453
Sac-168= 1 T.S. = 1-165085
Sac-107= 2
Total = 5 with Sac-45 (-1)
Horizon marker for late subphase of Early Windmiller.

C1d: Medium (111-132 mm, average 122 mm). Nearly round cross section far from tip in 3 specimens, and perforation placed close to tip in 1. End flattened (3) or pointed (1). Tip flattened. One has beveled strip and 2 have asphalt traces running vertically from perforation to tip. All have a mid-point angularity suggestive of (though not as developed as) B1b3. This type, all found with a single burial at SJo-68, has traits suggestive of the transition from C1a-b (hole placement, narrower or pointed ends) and B1b3 (mid-point angularity, near round cross section, hole placement); however, this burial is stratigraphically older than those with either C1a, or C1b (and much older than B1b3), so the group must be considered an anomaly at present. Material: all mottled serpentine (2 may approach granite). Total of 4 from 1 burial at SJo-68. T.S. = 1-73446 (others have hole placement farther from tip).

Unless there is something peculiar about the interment of burial 67, the type is Early Windmiller, late subphase.

C2: Same as C1 except for notched tip.

C2a: Long (140-149 mm, average 145 mm. 5 specs.) Oval to round cross section. Perforation placed far from tip (often extremely so, as with C3a). End flattened (4) to pointed (1). Tip notched or nicked. Convex sides. Variable material: 2 marble, 2 burned serpentine, 1 greenish-gray schist (like Sac-168 Bla3). Total of 5: SJo-68 = 5 T.S. = 1-73430. Horizon marker for late subphase of Early Windmiller.

C2c: Short (85-99 mm, average 90 mm. 5 specs)Oval cross sec. Variable perforation placement; far from or close to tip. End pointed to flattened. Notched tip (usually only nicked). Convex sides. Variable material: 2 serpentine (burned); 1 claystone; 1 granite; 1 unknown. Total of 5 specimens: SJo-68 = 5 T.S. = 1-73457. Horizon marker for late subphase of Early Windmiller.

C3: Grooved tip . Perforation usually placed far from tip(usually extremely so; relatively close in 1 C3b and 1 C3c). Pointed ends. Usually oval cross section (rarely round). Convex sides.

C3a: Long (147-180 mm, average 160 mm. 4 specs.)Oval (4) to nearly round (1) cross section. Total of 5: SJo-68 = 3 T.S. = 1-73409. Sac-107 = 2 (1 + 1). Variable material: 3 marble, 1 mottled serpentine; 1 claystone. Horizon marker for late subphase of Early Windmiller.

C3b: Medium (108-128 mm, average 118 mm. 8 specs.) Oval cross section (1 round). Variable material: 3 claystone, 2 serpentine (1 burned), single examples of marble, sandstone, diorite(?), and metamorphic. Total of 9: SJo-68 = 9 T.S.= 1-73414 Probable horizon marker for early subphase of Early Windmiller.

C3c: Short (79-95 mm, average 90 mm . 3 specs) Oval cross section. Variable material: 2 marble (Sac-107); 1 serpentine (burned; SJo-68). Total of 3: Sac-107 = 2 T.S. = 1-46462
SJo-68 = 1
Probable horizon marker for early subphase of Early Windmiller.

C4: "Channeled"
Diagnostic trait is narrow, shallow channel which encircles the charmstone longitudinally. While the perforated specimens (type C4a) probably form an historical type, the unperforated group does not (some specimens are earlier in the Oak Grove Tradition of Santa Barbara; most are later, being typical of the Cosumnes Tradition) Too few specimens exist to know whether the special 3-fold size distinctions proposed for the C1-C3 group also apply to C4. In the following description, the general charmstone size categories have

been used, and the a, b distinctions are based on the configuration of the sides.

C4a: "Convex channeled." Convex sides.

C4a1: Medium length (127 mm.) round cross section. Bipointed, with notched tip and end. The single specimen is unperforated, with 2 unsuccessful attempts at perforation far from the tip. Material: sandstone. Total of 1: SJo-68 = 1 T.S. = 1-73407. Probable horizon marker for early subphase of Early Windmiller.

C4a2: Short length (111 mm) oval cross section. Notched tip and end, less bipointed than C4a1. Perforation placed close to tip. Material: translucent marble. Total of 1: Sac-107 = 1. T.S. = 1-46281. Probable horizon marker for early subphase of Early Windmiller.

C4b: "Bulging channeled". Short length (85 mm.) oval cross section. Unperforated. Distinct bulge at mid-point in contrast to convex sides of C4a. Notched tip and end. Material: vesicular basalt. Total of 1: Sac-107 = +1. T.S. = L12552A. Probably falls in the transition between the Windmiller and Cosumnes traditions. May represent foreign influence rather than continuity from C4a.

C5: "Beveled" (possib ly unrelated to C assemblage; may be shifted to D). Short (87-103 mm., average 95 mm. 2 spec.) Round cross section. Perforation variable; one specimen was originally perforated and was reworked after breakage through perforation, including an attempted redrilling; other specimen unperforated. Notched tip. Beveled tip: short triangular section flattened to channeled at tip on both faces. Flattened end, convex sides. Variable material: 1 granite; 1 mottled serpentine. Total of 2: Sac-107 = +2. T.S. = L12550A. May be horizon marker for transition between Windmiller and Consumnes traditions.

Assemblage D

Miscellaneous group of unrelated types. D will serve as catch-all for all unique and rare types which have no obvious relationship to other types.

D1, D2 (and D8 ? D9 ?) might form a related group. D4 perhaps belongs in group E. D7 might represent a reworked type B1a. The remainder are unique at present.

D1: "Pear." Very short to short length (46-84 mm, average 64 mm. 3 spec.) Oval to round cross section. Perforated; 1 redrilled after breakage through perforation. Broad to narrow pear shape. Rounded end. Tips missing (probably flattened). Variable material. May represent horizon marker for Terminal Windmiller into transition to Cosumnes. (Shape is too simple to emphasize, but similar forms are the dominant charmstones of the Berkeley and Patterson phases on San Francisco Bay.)

D1a: "Broad pear." Very short (61 mm.) Oval cross section. Broad relative to length. Material: flaky green serpentine (see D4).

Total: 1 Sac-107 T.S. = L16956. Dating: Terminal Windmiller (earliest of type D1).

D1b: "Narrow pear." Very short to short (46-84 mm., average 68 mm. 2 specs). Oval to round cross section. Narrow width relative to length. Variable materials: marble (SJo-112); gray schist? (Sac-28). Total of 2: SJo-112 =1 T.S. = Marino Coll., Olsen and Wilson, 1964, Fig. 5f. Sac-28D =1 T.S. = 1-98245. Possible horizon marker for Terminal Windmiller and Windmiller-Cosumnes transition.

D2: "Drop." Very short (44 mm.) Oval cross section. Very broad body with narrow tip. Perforation close to tip. Rounded end and tip. Material: black steatite (unique material). Total of 1: SJo-56 = 1 T.S. = L19228. Dating: Terminal Windmiller.

D3: "Triangular." Short (100 mm.) Rhomboidal cross section (hence specimen is not a reworked type A3). Triangular shape, with flattened tip and end. Gently convex sides. Material: blue schist (identical to that of Types A, B2). Total of 1: Sac-107 = 1 T.S. = L16303. Dating: Middle Windmiller.

D4: "Pendant." Short (69 mm.) Round cross section. Narrow cylindrical tip enlarging to bulbous end. Possibly phallic (type E). Unperforated. Material: flaky green serpentine (see Type D1a). Total of 1: Sac-107 = +1. T.S. = 1-46579. Dating: possibly Windmiller-Cosumnes transition.

D5: "Pestle." Extremely long (longest of all charmstones): 370 mm. Oval cross section. Outline shape is very long isosceles triangle. Unperforated. Material and associations suggest that this was a functional charmstone (it definitely was not a functional pestle). It has a polished finish and therefore it is not likely that it represents raw material for a type A charmstone. Material: blue schist (identical to Types A, B2, D3). Total of 1: Sac-107 = 1. T.S. = L16668. Dating: Middle Windmiller.

D6: "Shield." Short (92 mm.) Flat oval cross section. Oval body tapers sharply to short round tip. Unperforated. Shallow central groove runs longitudinally along most of one face. Made from large pebble (cf. D9); face ground, but "back" is that of unmodified waterworn pebble. Material: sandstone. Total of 1: Sac-107 = +1. T.S. = L15069. Dating: possibly Windmiller-Cosumnes transition.

D7: "Club." Medium length (158 mm.) Oval cross section. Narrow, elongate truncated shape; convex sides, flattened tip and end. Unperforated; double grooves encircle tip end horizontally. (Specimen might represent an extensively reworked B1a2 specimen which broke). Material: marble. Total of 1: SJo-56 =1. T.S. = L19168. Dating: Late Windmiller.

D8: "Teardrop." Short (69 mm.) Round cross section. Simple teardrop shape; convex sides; end slightly flattened; tip probably pointed. Unperforated (perhaps because of material). Material: quartz crystal; completely ground; coated with asphalt. Total of 1: SJo-68 =1. T.S. = 1-49069. Dating: Late Windmiller.

D9: "Pebble." Very short (39 mm.) Oval cross section. Pyriform shape; oval body with slightly constricted tip. Round tip and end. Body is unmodified waterworn pebble (cf. D6); tip has been shaped by careful pecking. Material: quartzite. Total of 1: SJo-68 = 1. T.S. = 1-55341. Dating: Terminal Windmiller.

D10: "Propeller." Medium length (167 mm.) Oval cross section. Central bulge with symmetrical pointed appendages on each side. Central perforation extremely large. Probably mounted on handle rather than suspended. Material: granite. Total of 1: Woodbridge = +1. T.S. = 1-56150. Dating: uncertain, but perforation suggests relationship with "doughnut stones" and "cogstones" so this may be the earliest of all Windmiller charmstones. At present there is little to suggest that D10 is stimulus for shape of Type A; details of form as well as the nature of suspension seem totally distinct.

E: "Phallic." This group probably forms an historical assemblage, with three distinct types.

E1: "Simple Phallic." Medium (147, 165 mm.) to long (180, 188 mm.); average medium 170 mm. Oval cross section (1 round). Central shaft slightly expanded at mid-point; symmetrical bulging tip and end. Tip bulge longitudinally grooved (ground), with notch. Simple end rounded. Perforated and unperforated: 1 specimen (Sac-168) has perforation just below tip bulge; the complete specimen from Sac-107 is unperforated. Two end fragments. Variable materials: 2 micaceous schist; 1 blue schist, 1 rhyolitic tuff. Total of 4:

Sac-107 = 2 T.S. = 1-46529
Sac-168 = 1 (+1)
SJo-142 = 1 (+) T.S. = 1-48808

Dating: Middle Windmiller: probably later than E2.

E2: "Spinner Phallic." Basic shape with central bulge relates to type A1.

E2a: "Flanged." Short (101 mm.) through medium (170 mm.) to long (194 mm.) Oval cross section. Central shaft has disc-shaped or reduced bulge centered around mid-point. Symmetrical tip and end expand to flange which is equal to or wider than central bulge. Tip notched, with pecked groove extending longitudinally through flange. Simple end rounded or flattened. Always perforated below flange, far from tip. Uniform material: blue schist. Total of 4: Sac-107 = 2 T.S. = L11734, L16302
Sac-168 =+2
Dating: Middle Windmiller; probably earlier than E1.

E2b: "Unflanged." Medium (158 mm.) Oval cross section. Bulging central shaft. Symmetrical tip and end expanded without ridged flange of E2a. Tip notched, with longitudinal pecked groove. Simple rounded end. Perforated below expanded tip. Material: blue schist. Total of 1: Rio Vista. T.S. = SIM (see Heizer, 1949: Fig. 10c). Dating: probably Middle Windmiller, contemporaneous with E2a.

E3: "Round Phallic." Short (76 mm.) Round cross section. Naturalistic head of penis. Unperforated: smaller and grooved horizontally. Material: marble. Total of 1: SJo-56 = 1. T.S. = L19226. Dating: Terminal Windmiller.

Assemblage F: Maul-like charmstones which probably represent related historical types. Short. Unperforated.

F1: "Barrel." Short (76 mm.) Round cross section. Nearly cylindrical; flat tip and end. Single horizontal encircling groove - narrow. Material: marble. Total of 1: Sac-107 = +1 T.S. = 1-86886. Dating: Probably Windmiller-Cosumnes Transition.

F2: "Bottle." Short (91, 95 mm.) Near-round cross section. Expanded body with constricted neck (for binding) and slightly expanded tip. Tip end flattened. Material: 1 marble; 1 unknown. Total of 2:
Sac-28D = 1 T.S. = 1-98250
Sac-46 = 1
Dating: Windmiller-Cosumnes Transition.

F3: "Nail." Short (102 mm.) Round cross section. Oval body (rounded end) separated from mushroom-shaped tip by very wide horizontal groove which encircles specimen. Material: granite. Total of 1: Sac-28D = 1. T.S. = 1-98244. Dating: Windmiller-Cosumnes Transition.

Endnotes

1) The Hathaway collection forms the body of the State Indian Exhibit at Sutter's Fort, Sacramento.

2) Richard Van Valkenburg, a student of J. P. Harrington, had previously excavated skeletal material from Southern California sites for Dr. Roy L. Moodie (1929), a Southern California physician interested in the pathology of early California Indians and A. Woodward of the Los Angeles County Museum.

3) Sac-107 is the only site on record containing the three major cultural components identified for this region. Between 1935 and 1937, Sacramento Junior College recovered over 200 burials from Sac-107. The field crews were financed by the Federal Emergency Relief Administration and the National Youth Administration.

4) It is now recognized that the "Intermediate" period at sites Sac-107, Sac-126, and Sac-127 was actually a mixture of the "Late" and "Transitional" periods mentioned above.

5) R. F. Heizer, R. K. Beardsley and F. Fenenga were the main contributors to these talks.

6) Fergusson and Libby, 1964:320; Treganza and Malamud, 1950; Heizer, 1967; Heizer, pers. comm., regarding the 8,000 B.P. dates on Buena Vista Lake archaeological deposits.

7) The Middle Horizon tradition was actually first described from the San Francisco Bay site, Emeryville, by Uhle (1907). The tradition was first recognized at Morse Mound (Sac-66) in 1937 but the Sacramento Junior College Bulletin No. 2 report is inadequate to serve as a type description. It may be advisable to change the name to Morse or Emeryville Culture after more complete analysis of the collections from the two sites.

8) I owe special thanks to Dr. James Bennyhoff for his help and guidance during the preparation of this chapter.

9) Artifacts in the University of California Lowie Museum of Anthropology are catalogued from 1-133681 to 1-134056; 1-134101; 1-34126-1-134140; 1-165093-1-165170; 1-171669-1-171682; 1-171770; 1-171801.

10) At least one burial (assigned the letter C) probably represents early Phase 2 (A and B would be late Phase 2) because the small magnesite disc and thin-lipped Olivella beads are early Phase 2 markers. (Table 1 looks misleading because Burials 1 and 6A also have "thin-lipped"; however, the thin-lipped type actually has two subtypes--the late ones (burials 1, 6A) are all oval thin-lipped while the early ones are round thin-lipped (Bennyhoff, pers. comm. 1967).

11) Hereafter referred to as UCAS. The UCAS was established in 1948 and in 1960 was abolished and succeeded by the Archaeological Research Facility of the Department of Anthropology (ARF).

12) . . . near the axis of the Great Valley under some of the islands west of Lodi, where the land has been reclaimed from sea level marshes, the peat attains a thickness of more than fifty feet. Such a condition indicates that the historic environment of sedimentation has prevailed for many centuries and that the tidal flats in the axis of the trough have subsided continuously in that period, for tules do not grow in water much more than 10 or 15 feet deep, and the accumulation of a foot of peat is conservatively estimated to require about 75 years (Stearns, 1930:32).

13) Increased rainfall probably marked the end of the Altithermal (at approximately 2500-2000 B.C.), causing flooding of rivers. Inhabitants may have abandoned the site at this point. Antevs (1950) gives probable rainfall figures for this period (cf. Baumhoff and Heizer, 1965).

14) In ancient mounds [in the Central Valley of California] a zone of visible concentration of $CaCO_3$ can be noted in the upper half of the profiles, and another one close to the bottom, when the submound soil is less permeable. This is due to a redistribution of $CaCO_3$ (in the form $Ca(HCO_3)$ which moves upward during most of the year, the evaporation being stronger than the precipitation, and moves downward during the short rainy seasons. In the oldest mounds such redistribution is almost entirely complete. A carbonate calcareous hardpan is formed at a depth of 1 or 2 feet, while on the bottom of the mounds no concentration of $CaCO_3$ can be found, being entirely washed out by the seasonal oscillation of watertable, and, perhaps to a lesser extent, by the percolating waters of the rainy seasons (Setzer, 1947:80).

Although the parent material which is fluviatile alluvium, cannot be considered as calcareous sediment, the high carbonate content of the mounds has a tendency to concentrate with time into a calcareous hardpan near to the surface, at a depth established by the downward push of the biotic factor. High $CaCO_3$ content is probably due to the fixation of Ca from burned wood, plant and animal residues [and shell], while K an Na carbonates were leached (Setzer, 1947:67; cf. Cook and Heizer, 1962:13-16; 1965:20).

15) Tamers and Pearson (1965) argue that radiocarbon bone dates even on burned bone are usually between one and two thousand years too young.

16) In this report, Dawson's finds are treated as a separate unit. Twenty-four years separate this first reported excavation and the major University of California excavation in 1947. Numerous changes in archaeological technique took place during this time, rendering the data incomparable. However, one must admire Dawson's excavation recording techniques. He did an excellent job of recording artifact locations and associations. He catalogued and described every artifact, and retained everything except skeletal material, which he reburied. Because the author has been unable to recheck the skeletal material, Dawson's sex and age determinations have been ignored. Vertical and rough horizontal provenience, drawing and the exact measurements of each artifact were made by Dawson. All association between artifacts and between the artifacts and skeletal material are recorded. In these pages, Dawson's material is used primarily to corroborate or to contrast with the results from the more recent and complete University of California excavations.

17) Heizer is in error in reporting the excavation as taking place in 1921 (1949:7).

18) Unlocated pits probably come from near the center of the mound. Pit 1, 1937 excavation, perhaps Pit A on the original site map (F-J/N2), contains burial nos. 1-4 (cf. site map); Treganza's Pit A, somewhere on the western edge of the mound, contains burial no. 10; Pit C, on the eastern edge of the mound, contains burial nos. 111, 112, and 113; Pit B lies on the central-southern edges; Burial nos. 14, 15, 16 and 17 come from an unlocated pit dug in 1941.

19) In short-period occupation sites, this could easily happen; it occurred in the Aleutians at Nikolski from 1952 to 1962, where only one or two infants were born and died in the entire ten-year period (Turner, pers. comm., 1966).

20) Hereafter referred to as S.J.C., Bull. 2.

21) Grave lot no. 24 at 30 inches below the surface may have contained another charmstone (Dawson's fieldnotes).

22) Bennyhoff considers charmstone type D10 the oldest Windmiller charmstone probably due to its resemblance of "doughnut stones" and "cogstones." The single specimen of this type, found at Woodbridge, California, has no stratigraphic provenience. It is morphologically identical to the un-

named groundstone object from Cougar Mountain Cave, Oregon (Cowles, 1959), which is also apparently quite old. In this case the original function may have been a digging stick weight and/or warclub head.

23) Asphaltum, traces of which occurred on many charmstones, is found in many localities in Southern California (Heizer and Treganza, 1944:332). In Central California, Marin County's Duxbury Point is a well-known asphaltum locality. The use of this seep was inferred by Schenck (1926:212); and by Heizer and Treganza (1944:333). In the Central Valley, seeps lie west and south of Buena Vista Lake and in the vicinity of Maricopa and Hazelton, Kern County (Wedel, 1941:37-38; Heizer and Treganza, 1944:333).

24) Assuming random distribution, the probability that points and charmstones would appear in the same male interment is calculated by multiplying:

$$\frac{\text{Males with points}}{\text{Males with artifacts}} \times \frac{\text{Males with charmstones}}{\text{Males with artifacts}} = \text{Probability}$$

$$\text{or } \frac{18}{30} \times \frac{11}{30} = \frac{198}{900} \quad \frac{22}{100} \sim 1/5$$

The actual number of male graves with points and charmstones is four out of thirty ($\sim$1/7).

25) $$\frac{\text{burials with beads}}{\text{burials with artifacts}} \times \frac{\text{burials with points}}{\text{burials with artifacts}} = \text{Probability of both beads and points in the same grave}$$

$$\frac{60}{127} \times \frac{61}{127} = \frac{3660}{16129} \sim \frac{25}{100}$$

26) Hematite was mined by the Sierra Miwok Indians from a mountain between Lake Eleanor and Cherry River called Voloamu (Barrett and Gifford, 1933:244; Heizer and Treganza, 1944:309-310).

27) Asphaltum was obtained by Bay Area Indians from Duxbury Point in Marin County (Schenck 1926:212), and in the Valley from Buena Vista Lake in the vicinity of Maricopa and Hazelton, Kern County (Heizer and Treganza, 1944: 332-333).

28) Log Population = 1/2 log of the area of the mound in square meters.

Log P = 1/2 log 987

1.49725 = 1/2 x 2.9943

P $\sim$ 31.4

The method of estimating population suggested by Howells based on an average death rate (1960:170) is not applicable given the probable intermittent nature of SJo-68's occupation.

29) Serpentine and gabbro deposits exist in a narrow outcrop along the western foothills of the Sierra Nevada mountains (H.Williams, 1966, pers. comm.). The strongly ferruginous mudstone is found fairly close to SJo-68 in the Ione formations of the northern and central coast ranges (Victor Allen, 1929).

30) SJo-56 appears to be the youngest of the Windmiller communities because of the large number of shell, stone, and bone artifact types in its assemblage similar to those from Cosumnes Culture components. Various soil and bone chemistry analyses also tend to support a young age for the site, although these same tests contradict the contemporaneousness of SJo-56 and SJo-142 (Heizer and Cook, 1949; Setzer, 1947). The possibility that SJo-142 contains only a cemetery, and hence no habitation midden, may account for the difference in soil chemistry.

31) The SJo-68B component appears to contain fewer artifact types which continue into the Cosumnes components. The lack of more recent forms of artifacts and SJo-68B's stratigraphic position below a younger and distinct Windmiller component support its early position in the sequence.

32) See Chapter I. Comparative bone chemistry yields results of limited reliability between sites, and archaeologists have never deliberately attempted to distinguish between Windmiller sites using matrix analysis.

Belous orders the sites: SJo-56, Sac-107C, SJo-142, SJo-68, from oldest to youngest. Dempsey and Baumhoff (1963:508, Table 5) place Sac-107C oldest, followed by SJo-142, SJo-68, and SJo-56. Heizer (1949) reaches still another arrangement by scanning the assemblages from the sites; he lists SJo-142 as the oldest, followed by Sac-107C, SJo-56 and SJo-68. Setzer (1957) places SJo-142 oldest, followed by Sac-107C and SJo-68. This paper orders the sites as follows, from oldest to youngest: SJo-68B, Sac-107C, Sac-168B, SJo-68A, SJo-56, and SJo-142.

33) Shell fragments occur in cremation no. 3 in SJo-68B. Only part of the obsidian points found in several cremations in SJo-68, SJo-142 and one cremation in Sac-107C are altered by heat.

34) Spencer and Jennings (1965) mention the use of small grooved clay balls or pellets by historic California Indians as slingstones for hunting water birds (cf. Cressman, 1960).

35) In general, fewer Cosumnesthan Windmiller graves contain artifacts (Heizer, 1949; Heizer and Fenenga, 1939; Heizer and Cook, 1949).

36) This shift to smaller points suggests a change in emphasis, possibly in the size or kinds of game exploited, with perhaps greater emphasis on fishing (Fenenga, 1953).

Weights of Chipped Stone. Early [Windmiller] and Middle [Cosumnes] Horizons (Cultures). (Fenenga, 1953:314, Fig. 1).

	Weight in grams																	
Site	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	20+
(Sac-99)																		
Deterding	4		3			1	1		1	1	1	1						4
(Sac-66)																		
Morse	1	2	3			3	4	3	1	3	2	2		4		1	1	10
(Sac-60)																		
Hicks						1	1		2	1	1	3	1	1		1		4

Site	Weight in grams (cont'd) 4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	20+
(Sac-43)																		
Brazil			1		1	1	1	3	2	1	1	1		1	4	1	2	13
(Sac-151)																		
Need					1	2	1			1	1	1			1		1	4
(SJo-56)																		
Phelps	1	6	6		6	5	9	4	1	3	5	3	1	4	3			5
(SJo-68)																		
Blossom		2	7		3	3	2	4	2	2	1	4	2	1	4	1	1	4
(Sac-107C)																		
Windmiller		1	1		2	2		4	1	1	1	4	2	1		1	1	11
(SJo-142)																		
McGillvray			1			2	3		3	3	1	1				2		3

37) A series of radiocarbon dates on bone collagen, run by Isotopes Inc., and Geochron Laboratories, substantiated the above order. Bone from SJo-142 burial nos. 15 and 16 (cat. nos. 12-5676, 12-5677) and SJo-56 burial no. 53 (cat. no. 12-7016) yield the youngest dates. The Geochron date for SJo-142 is considerably older than the one completed by Isotopes Inc. Considering the similarity between artifact assemblages from SJo-142 and SJo-56, the author is inclined to accept the Isotope date. Sac-107C burial nos. 27 and C8 (cat. nos. 12-5616, 12-5595) yield dates two to five hundred years older, while SJo-68, burial no. 23 (cat. no. 12-7571) is still older (cf. Chapter V).

38) The author has listed the evidence for cultural contact below in the order of its reliability: (1) trade items--Pacific Coast shell beads and specific raw materials; (2) stylistic similarities between projectile points, ground and polished stone charmstones, basketry, bone and grinding implements; (3) mortuary practices--the use of quartz crystals, canid, beaver and/or bear jaws and teeth, the extended burial position, and ground ochre as body paint; (4) similarities in subsistence.

Cultures could have had indirect contacts, perhaps passing goods or ideas from one area to another, in this way covering distances prohibitive to lone individuals or groups.

39) The Graduate Division of the University of California (from an NSF grant for the improvement of graduate research), the University of California Archaeological Research Facility, and the Committee on Research provided funds for the collagen dating.

40) The collagen dates obtained without treatment for humic acids by Isotopes

Inc., on SJo-56, SJo-142, Sac-107C and SJo-68B support the projectile point seriation described earlier (Chapter IV). The correspondence between the two independent orderings of components appears to substantiate the reliability of multinomial probability theory for this comparison of archaeological samples.

41) Between about 7,000 and 4,000 years ago, we have a number of radiocarbon-dated sites from the southern California coast region extending from Santa Barbara to San Diego. From Santa Rosa Island an age determinitation of midden shell (M-1133) gave an age of 7,350 years for what is apparently the Dune Dweller culture (Orr 1956). For the later Highland and culture on Santa Rosa Island there are two determinations--4,790 (UCLA-105) and 5,370 (L-446B) years old. On the mainland there is the Topanga site, as yet undated (Heizer and Lemert 1947; Treganza and Bierman 1958); Zuma Creek site (Peck 1955) date 4,950 years old (LJ-77); Malaga Cove site at Redondo Beach (Walker 1951) with an age of 6,510 years (LJ-3); the undated Little Sycamore site (Wallace 1954); the undated Oak Grove culture (D. B. Rogers 1929); [the date on the Oak Grove, Glen Annie Canyon site of 6,980 ± 620 B.P. (UCLA 606)]; ..the Pauma complex (True 1958); and the Scripps Estate site (Shumway, Hubbs, and Moriarty, 1961), which is radiocarbon dated as occupied between 5,460 and 7,370 years ago (samples LJ-79, LJ-109, LJ-110, LJ-221) . . . The trait inventory of the sites listed varies somewhat and may thus reflect regional subphases of a fairly simple and uncomplex culture type. The culture is generally characterized by the following: abundance of deep-basined metates; manos; scraper planes; flake scrapers; choppers; pebble hammerstones; pitted hammerstones; lesser frequency of bone tools (awls, punches); "cogstones" (cf. Eberhart 1961); flexed burials (at Little Sycamore site, Scripps Estate site; [In my opinion these sites should be grouped with later Cosumnes sites (cf. Treganza and Bierman, 1958; Wallace, 1955; prone extended burial, usually covered with a cairn of metates (Oak Grove sites, Topanga site [Phase I]); and reburial (Little Sycamore site, Topanga site [Phase II]). The economy was based on seed-gathering, which was supplemented with hunting and shellfish-collecting. The Milling Stone Horizon sites [generally] lack cremation, pottery, and C-shaped shell fishhooks. Use of ocean resources is limited . . . (Heizer, 1963:123).

42) This author has assumed the essential correctness of Antevs' division of the Post-Pleistocene. Baumhoff and Heizer (1965) have concisely presented both criticism and defense of the Antevs sequence. Their article contains convincing evidence of a moist period, a dry period and then another moist period, with regional variations according to the altitude, latitude and local physiography.

43) The assemblage is typically Late Pleistocene, or what Savage (1951) calls "Rancho la Brean," for which see also Stock (1946).

44) Isotopes Inc. reports that the Tranquillity bone, both animal and human, is too mineralized for collagen dating (J. Buckley, 1967, pers. comm.).

45) Shell dates also seem to fall consistently one to two thousand years older than expected. Carl L. Hubbs of the La Jolla Radiocarbon Laboratory states: "Doubts have been expressed on the validity of dates based on Anodonta shell, but our previous tests (see La Jolla IV, p. 69) have been consistent with expectation. The circumstance that burned and unburned shell gave identical age estimates is reassuring" (Hubbs, letter to Heizer, 1967). However, dates on shell and burned bone from the same level of the Planview site (Bryan, 1965: also Tamer and Pearson, 1965) illustrate the disparity often found between carbon and shell. The burned bison bone dates at 5145 ± 160 B.C., while the shell dates at 7,844 ± 500 B.C. Archaeologists date the Oak Grove and La Jolla components (except the Harris site) on shell, and all the dates are unfortunately subject to the same suspicion: shell may have absorbed carbonates from ground water both during and after the death of the organism. This carbonate could have affected the date, making it either too old or too young, depending on the source of the carbonates in the ground water. The same exchange, though to a lesser extent, occurs between bone and ground water carbonates. Laboratory technicians can remove this inorganic carbon only from bone.

46) UCLA-605-608: 6880 ± 120, 6980 ± 120, 7270 ± 120, 6380 ± 120 B.P. respectively (Ferguson and Libby, 1963:329).

47) Shell dates on this complex fall between 5,000 and 4,000 years ago (Libby and Ferguson, 1963).

48) Specific types of shell ornaments also link this site to the later complex (Wallace, 1954).

49) A series of dates for La Jollan sites ranges from 3900 ± 100 years to 7370 ± 100 years B.P. (Hubbs, Bien and Suess, 1960; Moriarty, Shumway and Warren, 1959; Warren True and Eudey, 1961).

50) The Cosumnes Culture has some charcoal dates ranging from two to four thousand years ago (Heizer 1958b).

51) Owen, Curtis and Miller (1964:466) claim all these sites date between 7,000 and 4,000 years ago:

(1) Triunfo Rockshelter (Ven-15) may have contained an early occupation assemblage which shared many non-perishable elements found in the Oak Grove. Kowta and Hurst (1960) equate it with Tank Site and Little Sycamore.

(2) Several sites in Bataquitos Lagoon and the Lower San Diequito Valley which fall within the geographic area of the La Jolla Complex (Rogers, 1929, 1945) share many traits with the La Jolla site at Scripps Estate Site I (Crabtree, Warren and True, 1963).

(3) Warren, True and Eudey (1961) consider the Green Valley sites a marginal phase of the La Jolla complex.

(4) True (1958) considers a number of the Valley Center sites and the San Marcos-Escondido area to be more representative of the Pauma

complex. Warren, True and Eudey (1961) discuss the relationship between the Pauma and the La Jolla complexes, which they feel form two aspects of a single culture.

(5) King (1962) thinks the Parker Mesa (LAn-215) assemblage looks like that of Zuma Creek and the Tank Sites.

52) Rogers, 1939; Plate 6b, 8a, b, c (crescents); Plate 9a, b, c, d (Mohave type points), 9e, f (Silver Lake points); and 9g, h, i (typical of the Gypsum Cave point).

53) A possibility exists that the shell intrudes into the sandy layer. Large rodent holes continue from the surface to the top of the conglomerate stratum.

54) "A similar degree of obscurity, which necessitates withholding acceptance, surrounds the age of artifacts associated with former beach lines in Southern California lake basins such as Lake Mohave and Lake Manix (Roberts 1940). A radiocarbon age (LJ-200) for fresh-water mussel shells from the high shore line of Lake Mohave of 9640 years may indeed date the lake stand, but it does not answer the problem of whether the stone artifacts occurring on the surface of that beach are the same age as the molluscan remains imbedded in the beach deposit. The most persuasive indication to date that the Lake Mohave materials may predate 7,000 years ago come from the recent excavation of the Harris site near San Diego (Warren and True 1961)" (Heizer, 1963:120-121).

55) Similar points, Types 5d, 5e and 7c in the Central Valley typology, sometimes occur in the later Windmiller phases. Assemblages from the Central Valley include only two or three Pinto points. The Glen Annie report illustrates several from the Oak Grove culture (Owen, Curtis and Miller, 1964). The points occur fairly commonly in the Cosumnes and La Jolla sites.

56) Contradictory dates come from the Pinto-Gypsum assemblages. Harrington assigns the Pinto assemblage from Stahl site at Little Lake to the early Medithermal, 3000-4000 years ago. In support of this dating, he cites radiocarbon dates of 3,870 $\pm$ 250 and 4,050 $\pm$ 300 B.P. for a Pinto deposit in Stuart Rockshelter, Moapa, Nevada. Similar dates come from the lower deposits of the South Fork Shelter (2397 B.C.) associated with a Pinto-Gypsum component (Baumhoff and Heizer, 1965:704). UCLA Geophysics Laboratory dates for charcoal from the early levels of the Stahl site, provisionally identified by Lanning (1963) as Little Lake Culture range between 3,500 and 3,900 B.P. (Heizer, pers. comm.). An early series of dates attributed to projectile points of Gypsum Cave type, based on sloth dung from Gypsum Cave, are 10,455 $\pm$ 340 and 8,527 $\pm$ 250 B.P. Wormington (1957) questioned the association between the dung samples and the artifacts. Heizer (pers. comm. 1967) had two wooden artifacts dated. The material, Harrington positively states, is coeval with the sloth-dung. The resulting dates are 2,400 and 2,900 B.P.

A series of 9,000-7,000 B.P. dates on the stratigraphically-older Sulphur Springs phase (Bryan, 1965:146) and the 4,000 B.P. dates on the younger San Pedro phase supports the age estimated for the Southwest.

57) The occurrence at the Rose Spring sites of these same corner-notched points associated with Elko-points in deposits dated no earlier than 4,000 B.P. convince Lanning, however, that the Stahl site, and the similar Pinto-Gypsum sites in north-central Nevada ought to fall between 3,000-1,500 years B.C.

58) These complexes would then have formed an early hunting gathering culture which expanded into California from a single center sometime at the end of the Altithermal, about 7,000 to 8,000 years ago (see Warren and True, 1961: 278).

59) Deadman Cave and Promontory Caves have yielded leaf-shaped points stratigraphically lower than a Pinto-like stemmed variety (Steward, 1937; Wormington, 1957:196-197).

60) Jennings, 1956, lists all California species of marine shell and their sources along the coast found in the Basin and Southwest.

61) The Newberry eruption occurred after the Mount Mazama eruption, which dates at 5,500 B.C., and before Newberry crater's last known eruption which took place 2,054 $\pm$ 230 B.P. (C-657) (Wormington 1957:181).

62) Davis (1960) questions the interpretation of stratigraphic associations in Cougar Mt. Cave.

63) Cressman suggests a minimum date of 7,000 years ago for the skeleton buried into the top of Level IV (Wormington, 1957:185).

64) The deposit is dated 4,132 $\pm$ 80 B.C. (Bryan, 1965:171-172).

65) C-14 date 3,986 $\pm$ 200 B.C.

66) Fort Rock Cave, Cougar Mountain Cave, Kawumkan Springs, Five Mile Rapids, The Dalles, Umatilla, Lewis River, and Wilson Butte Cave testify to a primary cultural deposition of parallel-stemmed and bi-pointed forms and the entrance of side- and corner-notched forms stratigraphically higher in the sequence during the Altithermal--about 6,000 B.P. (cf. Bryan, 1965:169-175).

67) Similar hypotheses have been suggested by other archaeologists: Daugherty (1956), MacNeish (1958) and Warren and True (1961).

68) Milling stones also appear absent from the lower levels of many Northwest Plateau sites (Cressman, 1960; Bryan, 1965).

69) Level IV's estimated time of deposition is about 7,500 B.P., during a period of increasing dessication.

70) Deposited about 3,500-2,500 B.P.

71) Rabbit Island [45BN15 in the Columbia River Basin Surveys, in the western half of Section 30, Township 8 North, Range 31 East, of Benton County, Washington] lies on the Columbia River, three miles downstream from its confluence with the Snake River.

The strata composing the site appears as follows: (I) wind-deposited sand over the whole site, 0.3 feet to 2.1 feet thick; (II) a hard, white layer of silt and volcanic ash present in the areas of burial concentration between 0.3 feet and 2.1 feet below the surface, and 0.4-2.0 feet thick; (III) evidence of erosion a loose, coarse, grey-brown sand with irregular horizontal distribution between 1.2 feet and 2.8 feet below the surface, and up to 2.8 feet thick, intersperses with lenses of fine silt (for the most part, these lenses lie south of the main burial concentration); (IV) the cobble base of the island, from 2 to 5 feet below the surface.

72) Butler (1961:34) dates Cold Springs I between 6,000 and 8,000 B.P., his estimate being based on the dates of volcanic ash falls which bracket the component. Swanson (1962) also reports on the Hat Creek site.

73) Idaho evidence of an influx of Great Basin traits into the Northwest Plateau during this time suggests these traits diffused somewhat earlier.

74) For discussion of additional evidence of contact given by basketry styles see Baumhoff and Heizer (1958), Heizer and Krieger (1956), Loud and Harrington (1929), Cressman (1942, 1956).

75) Evidenced by: (1) a break in the occupation of Danger Cave during the Altithermal maximal; (2) the shrinking of population illustrated by the smaller number of Chiricahua components than either Sulpher Springs or San Pedro components in Arizona (Sayles and Antevs, 1941); (3) the Altithermal sites in all but the Northern Basin; (4) the contraction of the Pinto-Amargosa Phase in the Mohave (Rogers, 1939); and (5) the Altithermal break in the occupation of San Luis Rey (True, 1958:255).

TABLE 1

CENTRAL CALIFORNIA CULTURE CLASSIFICATION

			LITTORAL ZONE		INTERIOR VALLEY ZONE		
			MARIN PROVINCE	ALAMEDA PROVINCE	DELTA PROVINCE	COLUSA PROVINCE	
HOTCHKISS CULTURE		Historic Tribes	Coast Miwok	Bay Costanoans	Plains Miwok S. Patwin, Nisenan	Patwin	
	Phase II	facies	Estero	Fernandez	Mosher	Miller	
		1860					
		b 1700					
		a 1500					
	Phase I	facies	Mendoza	Emeryville	Hollister	Sandhill	
		C 1100					
		B 700 A.D.					
		A 300 A.D.					

			COASTAL PROVINCE			INTERIOR PROVINCE				
COSUMNES CULTURE		facies	McClure	Ellis Landing	Morse	Deterding	Brazil	Need	Orwood	SOUTHERN CALIFORNIA
WINDMILLER CULTURE	Phase II	facies				San Joaquin		Sacramento		
						SJo-112		Sac-168B		
						SJo-56				
						SJo-142				
						SJo-68A				
								Sac-107C		
	Phase I					SJo-68B				Topanga, Phase I? Oak Grove? Buena Vista III? San Dieguito?

TABLE 2

COMPARATIVE SEQUENCING OF WINDMILLER SITES

Setzer, 1946:60, 63, Table 27	Belous, 1953:351	Heizer and Cook, 1949:87,92		Baumhoff and Dempsey, 1962:508
		SJo-56*		
SJo-68	SJo-68	SJo-68	SJo-68#	SJo-56
			SJo-56	SJo-68
SJo-56	SJo-142B	Sac-107C	Sac-107C	SJo-142B
SJo-142B	SJo-56	SJo-142B	SJo-142B	Sac-107C

* Cook's suggested sequence on the basis of comparative bone chemistry placed SJo-56 in the age range of the Cosumnes Culture.

Heizer's sequence from archaeological evidence.

TABLE 3

DISTRIBUTION OF GRAVE GOODS FOR BURIALS OF THE HOTCHKISS CULTURE, Sac-168A

TRAIT	LATE				TRANSITION			EARLY								GRAND TOTAL
	Bur. 1	Bur. 6A	Feat. 2A-C	Total	Feat. 11	Feat. 6A/6B	Total	Bur. 2	Feat. 5	Feat. 17	Bur. 3	Bur. 6B	Bur. 7	Feat. 10	Total	
Flexed simple interment									X						1	1
Flexed, grave-pit burning	X*	X	X	3	X	X	2	X		(X)	X	X*	X	X	6	11
Orientation SW	X			1				X?				X			2	3
" NW													X		1	1
" unknown		X	X	2	X	X	2		X	X	X			X	4	8
Grave lot probably inc.			X	1	X	X	2		X	X				X	3	6
Shell beads (total)	533	530	180	$1,243^{3}$	14	465	479^{2}	85	5	8	14	660	159	352	$1,283^{7}$	$3,005^{12}$
Clam shell disc beads	516	362	163	$1,041^{3}$	13	352	365^{2}	42	4	8	3	618	106	48	829^{7}	$2,235^{12}$
Olivella beads (total)	17	168	17	202^{3}	1	113	114^{2}	43	1	0	11	42	53	303	453^{6}	769^{11}
Type 1a (*O. biplicata*)	1			1^{1}		2	2^{1}				8	1	30		39^{3}	42^{5}
Type 1a (*O. baetica*)	2			2^{1}		6	6^{1}						4		4^{1}	12^{3}
Type 2a3 (trapazoid)						4	4^{1}	2				1		46	49^{3}	53^{4}
Type 3a1 (full-lipped)	10	149	9	168^{3}		14	14^{1}							1	1^{1}	183^{5}
Type 3a1 (thin-lipped)	4	19	(8)	(31^{3})	1	87	88^{2}	38	1		2	30	19	240	330^{6}	449^{11}
Type 3e (cupped)								3			1	10		16	30^{4}	30^{4}
Haliotis ruf. large disc bead														1	1^{1}	1^{1}
Magnesite disc beads (total)	1		(1)	2^{2}	2	8	10^{2}	30	3		1	10	5	93	142^{6}	154^{10}
Large disc	1			1^{1}												1^{1}
Medium disc					1	2	3^{2}	3							3^{1}	6^{3}
Small disc			(1)	(1^{1})	1	6	7^{2}	27	3		1	10	5	93	139^{6}	147^{9}

TABLE 3 (continued)

DISTRIBUTION OF GRAVE GOODS FOR BURIALS OF THE HOTCHKISS CULTURE, Sac-168A

TRAIT	LATE				TRANSITION			EARLY								GRAND TOTAL
	Bur. 1	Bur. 6A	Feat. 2A-C	Total	Feat. 11	Feat. 6A/6B	Total	Bur. 2	Feat. 5	Feat. 17	Bur. 3	Bur. 6B	Bur. 7	Feat. 10	Total	
Steatite small disc	2	4		6^{2}												6^{2}
Haliotis ornaments	7	9	3	19^{3}	2	20	22^{2}	17	0	3	2	5	17	13	57^{6}	98^{11}
Type A.2 segment				0		1	1^{1}					1	1		2^{2}	3^{3}
B.1				0			0	2		1		1	1	1	6^{5}	6^{5}
B.1.1	3	5		8^{2}		6	6^{1}	2				1	8	1	12^{4}	26^{7}
B.1.1.a				0			0							2	2^{1}	2^{1}
B.1.1.a.c(B.1.a.c?)				0			0				1				1^{1}	1^{1}
B.1.1.c				0			0							1	1^{1}	1^{1}
B.2.1				0			0						1		1^{1}	1^{1}
C.1				0			0							1	1^{1}	1^{1}
C.1.1			1	1^{1}	1		1^{1}								0	2^{2}
C.1.1.a				0			0						2		2^{1}	2^{1}
C.1.1.c				0			0	1					1	2	4^{3}	4^{3}
C.4.1.c				0			0	1							1^{1}	1^{1}
D.1		1		1^{1}			0								0	1^{1}
D.2.1	1			1^{1}			0								0	1^{1}
D.4		1		1^{1}			0								0	1^{1}
E.1.1				0		1	1^{1}						1		1^{1}	2^{2}
F.1				0		1	1^{1}	4							4^{1}	5^{2}
F.1.1	2	1		3^{2}	1	1	2^{2}							1	1^{1}	6^{5}

TABLE 3 (continued)

DISTRIBUTION OF GRAVE GOODS FOR BURIALS OF THE HOTCHKISS CULTURE, Sac-168A

TRAIT	LATE				TRANSITION			EARLY								GRAND TOTAL
	Bur. 1	Bur. 6A	Feat. 2A-C	Total	Feat. 11	Feat. 6^{A}_{B}	Total	Bur. 2	Feat. 5	Feat. 17	Bur. 3	Bur. 6B	Bur. 7	Feat. 10	Total	
Haliotis ornaments (cont.)																
Type F.1.1.a				0			0							1	1^{1}	1^{1}
F.1.1.c (F.1.c ?)	1			1^{1}			0								0	1^{1}
G.1.G				0			0			1					1^{1}	1^{1}
G.1.K				0		1	1^{1}								0	1^{1}
K.1				0			0	1							1^{1}	1^{1}
M.2.2				0			0			1					1^{1}	1^{1}
M.2.2.c				0			0						1		1^{1}	1^{1}
M.C.3		1		1^{1}			0								0	1^{1}
P.2				0			0	1							1^{1}	1^{1}
S.1.1			1	1^{1}		1	1^{1}								0	2^{2}
S.1.(1).1				0			0					1			1^{1}	1^{1}
T.1				0			0	1							1^{1}	1^{1}
T.1.1				0		1	1^{1}								0	1^{1}
W.1				0		1	1^{1}	2					1	1	4^{3}	5^{4}
Amorphous				0			0							1	1^{1}	1^{1}
Gorget				0		1	1^{1}								0	1^{1}
Unclassifiable frag.			1	1^{1}		5	5^{1}	2			1	1		1	5^{4}	11^{6}

TABLE 3 (continued)

DISTRIBUTION OF GRAVE GOODS FOR BURIALS OF THE HOTCHKISS CULTURE, Sac-168A

TRAIT	LATE				TRANSITION			EARLY								GRAND TOTAL
	Bur. 1	Bur. 6A	Feat. 2A-C	Total	Feat. 11	Feat. 6 A/B	Total	Bur. 2	Feat. 5	Feat. 17	Bur. 3	Bur. 6B	Bur. 7	Feat. 10	Total	
Whole Haliotis shell											1		1		2^{2}	2^{2}
Projectile points	1	1	2	4^{3}						6			2		8^{2}	12^{5}
Type A3			1	1^{1}						3					3^{1}	4^{2}
Type A1													1		1^{1}	1^{1}
Type B3										1					1^{1}	1^{1}
Type C2			1	1^{1}												1^{1}
Type C1	1	1		2^{2}						1			1		2^{2}	4^{4}
Type D										1					1^{1}	1^{1}
Slate knife													1		1^{1}	1^{1}
Obsidian knife fragment											1				1^{1}	1^{1}
Obsidian scraper											1			1	2^{2}	2^{2}
Unworked chert											1				1^{1}	1^{1}
Pestle fragment					1		1^{1}									1^{1}
Incised bird bone tube	1			1^{1}												1^{1}
Bipointed bird bone pin					1		1^{1}									1^{1}
Basketry frags. (carbonized)								4							4^{1}	4^{1}
TOTAL	545	544	186	$1,275^{3}$	20	493	513^{2}	136	8	17	21	675	185	459	$1,501^{7}$	$3,290^{12}$

* On back.

Superscript entries indicate number of burial occurrences.

( ) Entries are probably early Phase 2.

TABLE 4

DISTRIBUTION OF SHELL BEADS IN Sac-168

	Black Midden					Brown Midden									
	Burials		Midden (Unassoc.)	No Provenience Hotchkiss Type	Total Hotchkiss Culture	Burials		Unassociated				Total Midden	No Provenience Windmiller Type	Total Windmiller Culture	Grand Total
	#B	#S				#B	#S	0-8"	-8-16"	-16-24"	-24-34"				
Haliotis bead Type 1a						5	15	4	2	3	3	12	9	36	36
*Haliotis rufescens large disc bead (Type 4)	1	1		1	2										2
Haliotis rufescens large epidermis disc bead				1	1										1
Haliotis Type 2													2	2	2
Olivella beads (Total)	11	769		281	1,505	3	3	1		1	1	3	2	8	1,058
Spire-lopped (Total)	5	54		11	65			1		1	1	3		3	68
(Type 1a, O. biplicata)	(5)	(42)		(8)	(50)					(1)	(1)	(2)		(2)	(52)
(Type 1a, O. baetica)	(3)	(12)		(3)	(15)										(15)
(Type 1b, O. biplicata)								(1)				(1)		(1)	(1)
Type 2b						3	3						2	5	5
Type 2a3	4	53		7	60										60
Type 3a1 (Total)	11	632		258	890										890
(Thin-lipped)	(11)	(449)		(200)	(649)										(649)
(Full-lipped)	(5)	(183)		(58)	(241)										(241)
Type 3e	4	30		5	35										35

TABLE 4 (continued)

DISTRIBUTION OF SHELL BEADS IN Sac-168

	Black Midden					Brown Midden									
	Burials		Midden (Unassoc.)	No Provenience Hotchkiss Type	Total Hotchkiss Culture	Burials		Unassociated				Total Midden	No Provenience Windmiller Type	Total Windmiller Culture	Grand Total
	#B	#S				#B	#S	0-8"	-8-16"	-16-24"	-24-34"				
Saxidomus clam disc beads (Thick variant)	12 (1)	2,235 (1)	78	1,258 (1)	3,571 (3)										3,571 (3)
Tivela clam disc bead				1	1										1
Hinnites multirugosus globular bead				1	1										1
Total	12	3,005	78	1,543	4,626	7	18	5	2	4	4	15	13	46	4,672

#B = number of burials.

#S = number of specimens.

*Haliotis bead Type 4 - a circular disc Haliotis bead with a single central perforation occurred in disturbed midden at the surface of the site. The type is typical of the Cosumnes culture.

TABLE 5

DISTRIBUTION OF HALIOTIS ORNAMENTS - Sac-168

TYPE	Black Midden Sac-168A					Brown Midden Sac-168B							
	Burial		Unassociated Midden	No Provenience Hotchkiss Type	Total Hotchkiss Types	Burial		Unassociated			No Provenience Windmiller Type	Total Windmiller Types	Grand Total
	#B	#S				#B	#S	0-12"	12-24"	24-36"			
A2 Segment	1	3		3	6								6
B1	5	6		2	8								8
B1n									1			1	1
B1c				1	1								1
B1.1	7	26	1	15	42								42
B1.1.a	2	2		2	4								4
B1.1.ac	1	1			1								1
B1.1.c	1	1		2	3								3
B2.1	1	1		1	2								2
B2.2.c				1	1								1
B3.1.c				1	1								1
B3.3				1	1								1
C1	1	1		1	2								2
C(1)n Segment										1		1	1
C1.c				1	1								1
C1.1	2	2		2	4								4
C1.1.a	1	2			2								2
C1.1.c	3	4	2	3	9								9
C(2)n								1				1	1
C(2)1.n						1	1					1	1
C2.1.c			1		1								1
C4.1.c	1	1			1								1
D1	1	1			1								1
D1.1.e				1	1								1
D2 (eared)				1	1								1

TABLE 5 (continued)

DISTRIBUTION OF HALIOTIS ORNAMENTS - Sac-168

TYPE	Black Midden Sac-168A					Brown Midden Sac-168B							Grand Total
	Burial		Unassociated Midden	No Provenience Hotchkiss Type	Total Hotchkiss Types	Burial		Unassociated			No Provenience Windmiller Type	Total Windmiller Types	
	#B	#S				#B	#S	0-12"	12-24"	24-36"			
D2.1	1	1			1								1
D2.2				1	1								1
D2.2 (eared)				2	2								2
D4	1	1		1	2								2
D4.e				1	1								1
D6				1	1								1
E1				1	1								1
E1.1	2	2		4	6								6
E1.1.a				1	1								1
E2				1	1								1
E2.2.e			1		1								1
F1	2	5			5								5
F1.1	5	6		2	8								8
F1.1.a	1	1			1								1
F1.1.c (F1c?)	1	1			1								1
F2.1				1	1								1
G1.G	1	1			1								1
G1.a.H				1	1								1
G1.J				1	1								1
G1.K	1	1			1								1
G1.L				1	1								1
G1.M				1	1								1
H3									1			1	1
K1	1	1			1								1
L1				1	1								1

TABLE 5 (continued)

DISTRIBUTION OF HALIOTIS ORNAMENTS - Sac-168

TYPE	Black Midden Sac-168A					Brown Midden Sac-168B							Grand Total
	Burial		Unassociated Midden	No Provenience Hotchkiss Type	Total Hotchkiss Types	Burial		Unassociated			No Provenience Windmiller Type	Total Windmiller Types	
	#B	#S				#B	#S	0-12"	12-24"	24-36"			
MB.2.2	1	1			1								1
MB.2.2.c	1	1			1								1
MC.3	1	1			1								1
N1				2	2								2
P2	1	1			1								1
S1				1	1								1
S1.1	2	2		2	4								4
S1.1.ac				1	1								1
S1.1.c				1	1								1
S1(1)1	1	1			1								1
T1	1	1			1								1
T1.1	1	1			1								1
W1	4	5			5								5
Amorphous	1	1		1	2								2
Gorget	1	1			1								1
Unclassifiable	6	11	1	5	17	1	1					1	18
Totals	10	98	6	72	176	2	2	1	2	1	0	6	182
Whole Haliotis shell	2	2			2								2

#B = Number of burials and features with ornaments.
#S = Number of specimens with those burials and features.

TABLE 6

STONE ARTIFACTS FROM Sac-168

	Component A					Component B										
	Black Midden					Brown Midden										
	Burials		Midden (Unassoc.)	No Prov. Hotchkiss Type	Total Hotchkiss Culture	Burials		Unassociated Hardpan					Total Midden	No Prov. Windmiller	Total Windmiller Cul.	Grand Total
	#B	#S				#B	#S	0-8"	-8-16"	-16-24"	-24-32"	-32-42"				
Magnesite Beads	10	154	6	54	214											214
(small discs 4-9 x 2-4)*	(9)	(147)	(6)	(47)	(200)											(200)
(medium discs 10-17 x 4-11)	(3)	(6)		(5)	(11)											(11)
(large disc 27 x 22)	(1)	(1)			(1)											(1)
(small cylinders length = 18, 9 diam = 15, 8)				(2)	(2)											(2)
Steatite Disc Beads (8-12 x 2-6)	2	6	1	11	18											18
Siltstone Disc Bead (diam = 28 th = 2)				1	1											1
Charmstones						10	21	3	4	3	4	2	16	12	49	49
Type A1a						1	1								1	1
A1b1						4	5	1	1				2	4	11	11
A2a1						1	1		1		2	1	4	4	9	9
A2b														1	1	1
A3a											1		1		1	1
A3b						1	1								1	1
A3c						1	1				1		1		2	2
B1a1						1	1								1	1

TABLE 6 (continued)

STONE ARTIFACTS FROM Sac-168

	Component A					Component B										
	Black Midden					Brown Midden										
	Burials		Midden (Unassoc.)	No Prov. Hotchkiss Type	Total Hotchkiss Culture	Burials		Unassociated Hardpan					Total Midden	No Prov. Windmiller Type	Total Windmiller Culture	Grand Total
	#B	#S				#B	#S	0-8"	-8-16"	-16-24"	-24-32"	-32-42"				
Charmstones (cont.)																
Type B1a2														1	1	1
B1a3						2	2								2	2
B1b2						2	4								4	4
B1b3						1	3	1	2				3	1	7	7
B2						1	1								1	1
B4a						1	1								1	1
C1b										1			1	1	2	2
C1c										1			1		1	1
E1								1					1		1	1
E2										1		1	2		2	2
Slate rod						1	1								1	1
Mortars and metates						1	1		1	2	3	6	12	2	15	15
Pestle	1	1			1	1	1	2		1	2	1	6	2	9	10
Points	5	14	2	10	26	4	4	4	7	3	3	4	21	16	41	67
Hotchkiss																
A1	1	1			1											1
A3	2	4	1	1	6											6
B3	2	2			2											2
C1	4	4		4	8											8
C2	1	1			1											1
D	1	1		1	2											2
Slate knife	1	1	1	1	3											3
Fragment				3	3											3

TABLE 6 (continued)

STONE ARTIFACTS FROM Sac-168

	Component A					Component B										
	Black Midden					Brown Midden										
	Burials		Midden (Unassoc)	No Prov. Hotchkiss Type	Total Hotchkiss Culture	Burials		Unassociated					Total Midden	No Prov. Windmiller Type	Total Windmiller Culture	Grand Total
								Hardpan								
	#B	#S				#B	#S	0- -8"	-8- -16"	-16- -24"	-24- -32"	-32- -42"				
Points (continued)																
Windmiller																
1											1		1	2	3	3
2												1	1	1	2	2
3a									2	1			3		3	3
3b						1	1								1	1
5a												1	1	5	6	6
5b														1	1	1
7d								1					1		1	1
5e									1				1		1	1
7a												1	1	1	2	2
7b								1					1		1	1
7c								1					1		1	1
Fragment						3	3	1	4	2	2	1	10	6	19	19
Steatite pipe						1	1								1	1
Quartz crystal								1	2		2	1	6	2	8	8
Ochre						1	1								1	1
Flake scr.												2	2	2	4	4
Thumbnail scr.			1	1	2											2
Core scr.												4	4	2	6	6
Worked stone	1	1	1	2	4			2					2		2	6
Unworked stone	1	1	7	1	9			2		8		1	11		11	20
Total	11	177	18	80	275	15	30	14	14	17	14	21	80	38	148	423

#B = number of burials. #S = number of specimens.

* Size in millimeters increases progressively from early Phase 2 to historic times.

TABLE 7

BONE, ANTLER AND TURTLE PLASTRON DISTRIBUTION, Sac-168A.

Type	Black Midden			Brown Midden			No Provenience
	B#	S#	Unassoc.	B#	S#	Unassoc.	
Bird-bone tube	1	1	1				
Bi-pointed bone rod			2				
Awl							2
Antler flaker						1	
Cut antler						1	
Turtle plastron ornament				1	1		

TABLE 8

DISTRIBUTION OF BAKED CLAY IN Sac-168

BAKED CLAY OBJECT	Black Midden				Brown Midden										Decoration				
	Component A				Component B														
					Hardpan														
	0-8"	8-16"	16-24"	Total	0-8"	-8-16"	-16-24"	-24-32"	-32-40"	-40+"	Total	No Provenience	Burials	Grand Total	Cord Impressed	Basketry Impressed	Incised	Pitted	Fingernail
Unshaped		6		6		1	4	8	15	3	31	7	2(2)	46					
Globular (shaped)	4_4			4				1	7		8	1		13	4				
Smooth fragment	5_1		1	6	3_1	3	2_2	7_1	5_2	9_2	29_9	4	$9^{(2)}$	48	4	3	1		1
Disc	2_1		2_2	4	1	1			3_x		5	2	$4^{(2)}$	15			3	1	
Perforated disc	1			1										1					
Ball										1	1		$4^{(2)}$	5					
Biconical			1	1	1			1		1	3		$1^{(1)}$	5					
Grooved biconical (pecan)									1_1		1_1	1_1		2	2				
Unclassified	2	1	3	6	3		1				4	1		11					
Spools(?)												3		3					
Bowl													$1^{(1)}$	1					
Total				28							82	19	21	150					

Note: Burial nos. 27 (disc), 17 (ball), 26 (bowl), 10 (biconical), all contained one shaped clay object except burial no. 12 which contained two smooth fragments and an unshaped piece.
Feature no. 9 consisted primarily of a cache of baked clay (4 unshaped, 3 discs, 3 balls, 4 fragments).

Superscript = number of burials and/or features. Subscript = impressed or incised piece.
( ) = brown midden. x = pitted or fingernail impressions.

TABLE 9

BURIAL POSITION, ORIENTATION AND GRAVE OFFERINGS
IN SITE Sac-168B

	With Grave Goods		Without Grave Goods		Totals	
	Number	Percent	Number	Percent	Number	Percent
Position						
Extended on face	11	37	9	30	20	67
Extended on back	4	13	0	0	4	13
Extended on side	1	3	0	0	1	3
Indeterminate	2	7	3	10	1	3
Totals	18	60	12	40	30	100
Orientation						
Westerly	14	47	9	30	23	77
Other	2	7	0	0	2	7
Indeterminate	2	7	3	10	5	17
Totals	18	60	12	40	30	100

TABLE 10

POSITION OF GRAVE GOODS IN THE BURIAL PITS OF Sac-168B

Body Area	Charmstone	Shell	Pestle/ Mortar	Point	Slate Pencil	Baked Clay
Head and neck		7	1			1
Chest			1	2		1
Legs				2		
Pelvic	6				1	
10" from body	1					
Unknown	2					3
Total Burials	9	7	2	4	1	5

TABLE 11

DISTRIBUTION OF GRAVE GOODS FOR BURIALS OF THE WINDMILLER CULTURE (INCLUDING THREE CACHES), Site Sac-168B

Trait	BURIALS																								
	4	5	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Extended on face	X	X	X		X	X	X	X	X		X		X	X	X	X		X	X	X	X		X	X	X
Extended on back										X		X					X					X			
Extended on left side				X																					
Disturbed																									
Oriented W	X	X	X			X		X			X					X				X					
Oriented SW (WSW)				X	X		X			X		X	X	X	X		X	X	X		X		X	X	X
Oriented SE (SSE)									S													SE			
Unknown																									
Skull missing							X									X	X	X	X						X
Skeleton very incomp.	X			X	X	X	X	X	X							X	X	X	X		X		X	X	
Isolated skull																				(X)*					
No associations		X	X								X		X	X	X	X		X		X					
Olivella 2b beads	1							1	1																
Haliotis 1a beads					6	4				3					1								1		
Haliotis ornament C(2)1a																									
Haliotis ornament fragment																									

TABLE 11 (continued)

DISTRIBUTION OF GRAVE GOODS FOR BURIALS OF THE WINDMILLER CULTURE (INCLUDING THREE CACHES), Site Sac-168B.

Trait	BURIALS						CACHES			GRAND TOTAL BURIALS AND CACHES
	F.1	F.8	F.13	F.14	F.16	Total Burials	F.4	F.9	F.12	
Extended on face										20
Extended on back										4
Extended on left side										1
Disturbed		X	X	X	X					6
Oriented W										8
Oriented SW (WSW)										16
Oriented SE (SSE)										2
Unknown	X	X	X	X	X					7
Skull missing										6
Skeleton very incomp.										14
Isolated skull		X	X	X	X					5*
No associations		X		X	X					13
Olivella 2b beads						3^{3}				3^{3}
Haliotis 1a beads						15^{5}				15^{5}
Haliotis ornament C(2)1a			1			1^{1}				1^{1}
Haliotis ornament fragment			1			1^{1}				1^{1}

Superscript numbers in total column indicate number of grave occurrences.

TABLE 11 (continued)

DISTRIBUTION OF GRAVE GOODS FOR BURIALS OF THE WINDMILLER CULTURE (INCLUDING THREE CACHES), Site Sac-168B.

Trait	BURIALS						CACHES			GRAND TOTAL BURIALS AND CACHES
	F.1	F.8	F.13	F.14	F.16	Total Burials	F.4	F.9	F.12	
Baked clay objects						7^{5}		14		21^{6}
Unshaped						1^{1}		1		2^{2}
Disc/ball						2^{1}		6		8^{3}
Biconical						1^{1}				1^{1}
Smooth fragment						2^{2}		7		9^{2}
Bowl fragment						1^{1}				1^{1}
Turtle shell ornament						1^{1}				1^{1}
Charmstones (Total)	6					17^{9}			4	21^{10}
A1a						1^{1}				1^{1}
A1b1						4^{3}			1	5^{4}
A2a1									1	1^{1}
A3b									1	1^{1}
A3c									1	1^{1}
B1a1						1^{1}				1^{1}
B1a3						2^{2}				2^{2}
B1b2	3					4^{2}				4^{2}
B1b3	3					3^{1}				3^{1}
B2						1^{1}				1^{1}
B4a						1^{1}				1^{1}
Point type 3b										1^{1}
Unclass. point type						3^{3}				3^{3}
Red ochre						2^{1}			1**	2^{1}
Mortar (rim frag.)						1^{1}				1^{1}
Pestle fragment						1^{1}				1^{1}
Slate pencil						1^{1}				1^{1}
Unworked pebbles							25			25^{1}
Total Artifacts Per Burial							25	13	4	

Superscript numbers in total column indicate number of grave occurrences.

* Scapula present in B25. ** Red ochre on charmstone.

TABLE 11 (continued)

DISTRIBUTION OF GRAVE GOODS FOR BURIALS OF THE WINDMILLER CULTURE (INCLUDING THREE CACHES), Site Sac-168B.

Trait	BURIALS																								
	4	5	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Baked clay objects					1		3					1									1	1			
Unshaped							1																		
Disc/ball												1										1			
Biconical					1																				
Smooth fragment							2																		
Bowl fragment																					1				
Turtle shell ornament												1													
Charmstones (Total)			1		2	1						1						1	3				1		1
A1a																									1
A1b1					2							1						1							
A2a1																									
A3b																									
A3c																									
B1a1																			1						
B1a3																			1				1		
B1b2			1																						
B1b3																									
B2																			1						
B4a						1																			
Point type 3b																					1				
Unclass. point tip							1			1														1	
Red ochre																			1				1**		
Mortar (rim frag.)																	1								
Pestle fragment				1																					
Slate pencil																	1								
Unworked pebbles																									
Total Artifacts Per Burial	1			1	1	11	4	1	1	3		3					2	1	4		2	1	2	1	1

* Scapula present in B25.

** Red ochre on charmstone.

TABLE 12

CHARMSTONE RAW MATERIAL FROM Sac-168B

Material	A1a	A1b1	A2a1	A2b	A3a	A3b	A3c	B1a1	B1a2	B1a3	B1b2	B1b3	B2	B4a	C1b	C1c	E1	E2	Total	Percent
Schist	$1^{\underline{1}}$	$11^{\underline{5}}$	$9^{\underline{1}}$	1		$1^{\underline{1}}$	$2^{\underline{1}}$			$1^{\underline{1}}$		1					1	2	$30^{\underline{10}}$	61.2
(blue)	$(1^{\underline{1}})$	$(9^{\underline{4}})$	$(9^{\underline{1}})$	(1)		$(1^{\underline{1}})$	(1)										(1)	(1)	$(24^{\underline{7}})$	(49.0)
(blue-black)		$(2^{\underline{1}})$					$(1^{\underline{1}})$											(1)	$(4^{\underline{2}})$	(8.2)
(greenish-grey)										$(1^{\underline{1}})$									$(1^{\underline{1}})$	(2.0)
(blackish-grey)												(1)							(1)	(2.0)
Serpentine											$4^{\underline{4}}$	$3^{\underline{3}}$	$1^{\underline{1}}$						$8^{\underline{8}}$	16.3
Gabbro												3				1			4	8.2
Transluscent marble					1			$1^{\underline{1}}$	1	$1^{\underline{1}}$				$1^{\underline{1}}$					$5^{\underline{3}}$	10.2
Granite rock (Andesite ?)															2				2	4.1
TOTAL	$1^{\underline{1}}$	$11^{\underline{5}}$	$9^{\underline{1}}$	1	1	$1^{\underline{1}}$	$2^{\underline{1}}$	$1^{\underline{1}}$	1	$2^{\underline{2}}$	$4^{\underline{4}}$	$7^{\underline{3}}$	$1^{\underline{1}}$	$1^{\underline{1}}$	2	1	1	2	$49^{\underline{21}}$	100.0

Superscript entries indicate number of specimens found with 9 burials and 1 cache.

TABLE 13

SIZE RANGE IN mm. OF CHARMSTONES FROM Sac-168B

Type	Length		Maximum Width		Maximum Thickness		Total Number of Specimens
	Range	Average	Range	Average	Range	Average	
A1a	222		42		?		1
A1b1	230-298	267^{3}	25-30	27^{7}	15-19	17^{7}	11
A2a1	192-281	231^{5}	29-31	29.5^{6}	15-19	17^{5}	9
A2b	152		37		17		1
A3a	302		39		25		1
A3b	215		29		15		1
A3c	$136\text{-}145^{R}$	140.5^{2}	33-34	33.5^{2}	23	23^{2}	2
B1a1	165		31		38		1
B1a2	108		35		31		1
B1a3	163-172	167.5^{2}	37-33	35^{2}	25-20	22.5^{2}	2
B1b2	187-238	206^{4}	27-28	27.5^{4}	27-28	27.5^{4}	4
B1b3	$115^{R}\text{-}142$	130^{4}	28-33	31^{4}	28-34	31^{4}	7
B2	102		45		28		1
B4a	115		28		27		1
C1b	125		35		33		2
C1c	86		40		38		1
E1	188^{R}		25		21		1
E2	194^{R}		27 center 30 end		19		2
							49

Superscript entries indicate number of specimens measured.

R indicates reconstruction based on symmetry (4 specimens only).

TABLE 14

SIZE AND MATERIAL OF PROJECTILE POINTS FROM Sac-168B

Type	Length	Width	Thickness	Number	Obsidian	Slate	Chert	Basalt	Quartz Crystals
1 (NAa)	45-68	12-17	9	3	3				
2 (NAb1)	33-?45	24-29	5-11	2	2				
3a (NAb2)	60-68	26-30	7-9	3	1	1			1
3b (NAb3)	66	37	10	1^{1}	1				
5a (SAa)	39-96	18-36	6-10	6			1	4	1
5b (SAb)	43	23	4			1			
7a (SBa)	?60-?85	19-34	4-8	2		1		1	
7b (SCa1)	53	23	8	1			1		
7c (SCa2)	?	27	3	1		1			
7d (SCa3)	50	27	6	1	1				
Fragments				19^{1}	12	4	3		
Totals				41	20	8	5	5	2

Superscript = number of burials containing points.

TABLE 15

HORIZONTAL DISTRIBUTION OF VARIOUS BURIAL POSITIONS
UCAS EXCAVATIONS, SJo-68.

Trenches	Burial Position**									
	EVW	EVO	EDW	EDO	ESW	ESO	FlexW	FlexO	Disturbed	Total
A-E	8+2*	1	6	2	1	1	1	2	1	25
F-J	18+1*	1	14	2		1		2	6	45
K-O	18	5	4+1*					1	5	34
Provenience lost	10		1						1	12
Total	57	7	26	4	1	2	1	5	13	116*

TABLE 16

VERTICAL DISTRIBUTION OF VARIOUS BURIAL POSITIONS
UCAS EXCAVATIONS, SJo-68.

Depth	Burial Position**									
	EVW	EVO	EDW	EDO	ESW	ESO	FlexW	FlexO	Disturbed	Total
0-30"	43+3*	1	8	1		1		1	7	64
30-60"	11	6	17+1*	3	1	1	1	4	6	52
Total	57	7	26	4	1	2	1	5	13	116

* Includes 4 additional individuals from multiple burials (numbers 33, 62, and 106).

** EVW = extended ventrally west
EVO = extended ventrally in a direction other than west
EDW = extended dorsally west
EDO = extended dorsally in a direction other than west
ESW = extended side west
ESO = extended side in a direction other than west
FlexW = flexed west
FlexO = flexed in a direction other than west.

TABLE 17

DEPTH AND HORIZONTAL PROVENIENCE OF EXTENDED VENTRAL BURIALS UCAS EXCAVATIONS, SJo-68.

Depth	Trenches				Total
	A-E	F-J	K-O	No Loc.	
0-30"	5+2*	15+1*	16	9	48
30-60"	5	4	6	1	16
Total	12	20	22	10	64

TABLE 18

DEPTH AND HORIZONTAL PROVENIENCE OF EXTENDED DORSAL BURIALS UCAS EXCAVATIONS, SJo-68.

Depth	Trenches				Total
	A-E	F-J	K-O	No Loc.	
0-30"	3	4	1	1	9
30-60"	4	13	3+1*		21
Total	7	17	5	1	30

* Includes 4 additional individuals from multiple burials (numbers 33, 62, and 106).

TABLE 19a

HORIZONTAL DISTRIBUTION OF GRAVES

UCAS Excavations, SJo-68.

Trenches	Total Number of Burials	Burials With Artifacts		Burials Without Artifacts		Burials With Ochre Only	
		Percent	Number	Percent	Number	Percent	Number
A-E N1-2	20	50	10	40	8	10	2
A-E N3-4	1	100	1				
A-E S1-2	3	33	1	67	2		
F-J N1-2	16	50	8	44	7	6	1
F-J N3-4	19	79	15	16	3	5	1
F-J S1-2	10	33	3	50	5	17	2
K-O N1-2	13	77	10	23	3		
K-O N3-4	12	58	7	42	5		
K-O S1-2	7	29	2	71	5		
No Provenience	12	33	4	58	7	8	1
Totals	113	54	61	40	45	6	7

TABLE 19b

HORIZONTAL DISTRIBUTION OF BURIALS

Dawson Excavation, 1923, Site SJo-68

Horizontal Provenience of Burials	With Artifacts	Questionable Association	Without Artifacts
A-E N1-2	0	0	
A-E S1-2	1	0	
F-J N1-2	24	0	Not Recorded
F-J S1-2	2	1	
K-O N1-2	33	6	
K-O S1-2	12	1	

Charts 19a and 19b show the horizontal distribution of burials excavated from SJo-68. The UCAS excavators completely explored the undisturbed northwestern section of the mound. Burials from these excavations occur most frequently in the central and eastern section of the mound. Dawson's excavations add to the number of burials from the north-central and eastern sections.

TABLE 20

VERTICAL DISTRIBUTION OF GRAVES BY 12-INCH LEVELS, Site SJo-68.

	University of California 1938-1947	Dawson 1923
0-11"	9	16
12-23"	30	39
24-35"	30	12
36-47"	33	0
48-60"	11	0
Unknown depth		8

TABLE 21

HORIZONTAL VERSUS VERTICAL DISTRIBUTION IN THE UNIVERSITY OF CALIFORNIA EXCAVATION, Site SJo-68

	AE/N1-2	AE/N3-4	AE/S1-2	FJ/N1-2	FJ/N3-4	FJ/S1-2	KO/N1-2	KO/N3-4	KO/S1-2	No Loc.
Shallow 0-30"	8	1	0	5	10	6	11	8	4	4
Deep 30-60"	12	0	3	11	9	4	2	4	3	0

TABLE 22

DISTRIBUTION OF BURIAL POSITIONS BY SEX*, SJo-68

Sex	Burial Position**									
	EVW	EVO	EDW	EDO	ESW	ESO	FlexW	FlexO	Dis-turbed	Total
Male	25	3	12	1	1	2		1	5	50
Female	20		8					4		32
Sex Unknown	13	2	8	1	1		1	1	21	48
Total	58	5	28	2	2	2	1	6	26	130

*The 24 individuals unaccounted for are too fragmentary to identify either sex or age and are without provenience.

**cf. Table 15.

TABLE 23

HORIZONTAL DISTRIBUTION BY SEX, SJo-68

Sex	Trenches				Total
	A-E	F-J	K-O	No Loc.	
Male	11	24	10	5	50
Female	12	7	8	5	32
Sex Unknown	10	19	14	5	48
Total	33	50	32	15	130

TABLE 24

VERTICAL DISTRIBUTION BY SEX, SJo-68

Sex	Depth	
	0-30"	30-60"
Male	25	25
Female	20	12
Sex Unknown	17	31
Total	62	68

TABLE 25

AGE GROUPINGS BY SEX, SJo-68
(Adapted from Brabender, 1963:7)

Sex	Foetus	0-1	1-18	19-20	21-34	35-54	+55	Unclassified	Total
Male					(4.5) 7	(12.3%) 19	(5.8%) 9	(1.9%) 3	(24.7%) 38
Female					(7.1%) 11	(12.9%) 20	(5.2%) 8	(0.6%) 1	(26.0%) 40
Sex Unknown	(1.3%) 2	(3.9%) 6	(19.5%) 30	(4.5%) 7	(1.3%) 2		(1.9%) 3	(16.9%) 26	(49.3%) 76
Total	(1.3%) 2	(3.9%) 6	(19.5%) 30	(4.5%) 7	(12.9%) 20	(25.2%) 39	(12.9%) 20	(19.5%) 30	(100%) 154

TABLE 26

GENERAL ARTHRITIC CHANGES IN SJo-68 AND Ala-328

	Age Groups			Unclassified Adult	Adult Total	Percent Affected By Sex
	Young Adult 20-34	Middle-Aged Adult 35-54	Old Adult +55			
Male	1*(1)**	6 (8)	6 (5)	0 (2)	13 (16)	34.2% (24.2%)
Female	4 (7)	9 (5)	5 (2)	0 (3)	18 (17)	45.0% (21.7%)
Sex Unknown	1 (1)	0 (1)	0 (2)	3 (3)	4 (7)	12.9% (11.3%)
Total Number	6 (9)	15 (14)	11 (9)	3 (8)	35 (40)	

*SJo-68. **(Ala-328). (Brabender, 1963:9)

TABLE 27

Spondylitis Deformans (OSTEO-ARTHRITIS) IN SJo-68 AND Ala-328

	Age Groups			Unclassified Adult	Adult Total	Percent Affected By Sex
	Young Adult 20-34	Middle-Aged Adult 35-54	Old Adult +55			
Male	2*(6)**	14 (15)	7 (5)	0 (8)	23 (35)	60.5% (53.0%)
Female	8 (11)	13 (13)	6 (6)	0 (11)	27 (41)	67.5% (52.5%)
Sex Unknown	0 (2)	0 (3)	1 (2)	3 (10)	4 (17)	12.9% (27.4%)
Total Number	10 (19)	27 (31)	14 (14)	3 (29)	54 (93)	

*SJo-68. **(Ala-328). (Brabender, 1963:9)

TABLE 28

AGE GROUPINGS BY SEX, SJo-68
(1966 Analysis by James Cadien)

Sex	0-6	6-12	12-21	21-45	50+	Unclassified	Total
Male			6(3.9%)	37(24.0%)	7(4.5%)		50 (32.5%)
Female			3(1.9%)	22(14.3%)	7(4.5%)		32 (20.0%)
Sex Unknown	16(10.4%)	9(5.8%)	5(3.2%)	15(9.7%)	3(1.9%)	24 (15.6%)	72 (46.7%)
Total	16(10.4%)	9(5.8%)	14(9.1%)	74(48.0%)	17(11.0%)	24 (15.6%)	154

TABLE 29

THE PERCENTAGE OF DEATHS BY AGE GROUP IN SJo-68, Ala-328, SAN JOAQUIN COUNTY, AND ALAMEDA COUNTY[1]

	Under 1 year	1-19 yrs.	20-34	35-54	55+yrs	Unclassified Adult
SJo-68	5.2%	24.0%	13.0%	25.3%	13.0%	19.5%
Ala-328	10.2%	31.4%	15.9%	15.3%	5.4%	21.8%
San Joaquin County, 1959[*]	5.5%	2.5%	3.0%	15.5%	73.5%	
Alameda County, 1959[*]	6.0%	2.5%	2.7%	13.8%	75.0%	

[*] Table 14 of the Public Health Statistical Report, 1959.

[1] From Brabender 1963.

TABLE 30

PERCENTAGE DISTRIBUTION OF DEATHS BY BROAD AGE GROUPS
IN ABORIGINAL AND MODERN POPULATIONS

(Adapted from Cook, 1947:86-87)

Population[1]	0-19	20-50	50+	0-9	10-19	20-40	40+	Total Individuals
Aboriginal								
W. African Negro	19.0	70.8	10.1			60.8	20.1	189
Tasmanians	37.5	46.9	16.6	3.1	34.4	40.6	21.9	32
Madisonville, Ohio	38.8			35.1	3.7			521
Hamilton Co., Ohio	24.7	52.1	23.3	13.7	11.0			73
California	22.6	76.2	3.2	11.4	11.2	65.9	13.4	537
Swartz ruin, New Mexico	48.6			45.7	2.9			1,009
Pecos, New Mexico	15.0	47.5	37.5	6.1	8.9	24.2	60.8	587
Indians, Valley of Mexico	23.9	59.4	15.7					138
SJo-68, Calif. (2,500 B.C.)	25.0	39.0	12.0	16.0	9.0	48.0	12.0	154
Ala-328, Calif. (386 B.C. - 1700 A.D.)[2]	41.6	31.2	5.4			36.6		
Modern Groups								
California Missions ca. 1800 A.D.	35.9	24.6	39.8	18.3	17.6	19.1	45.3	1,378
Hupa Agency, Calif. 1887	56.2	11.9	31.8	30.0	20.2	2.5	41.2	460
Calif. Mission Agency, 1902	29.0	31.5	38.1			20.0	49.6	2,487
Carson Agency, Nevada, 1902	47.6	9.3	42.2	30.4	17.2	4.4	47.1	1,080
California, 1928	29.5	39.3	29.9	19.9	9.6	29.5	39.7	22,050

[1]Both men and women included in counts.

[2]Heizer, 1958:4.

TABLE 31

COMPARATIVE POPULATION BREAKDOWN OF SJo-68 AND AN EASTERN ARCHAIC SITE, INDIAN KNOLL

Age	0-9	10-19	20-44	45+
Indian Knoll**	303 35%	112 13%	443 51%	10 1%
Age	0-12	13-20	21-49	50+
SJo-68*	25 16%	14 9%	61 40%	18 12%

* Divided by 154, the number of skeletons in the collection. Unclassified skeletons are probably those of adults or old people.

** From Tables 1 and 2, Johnston and Snow, 1961:240-241. Divided by 873.

TABLE 32

VERTICAL DISTRIBUTION OF AGE GROUPS

	DEPTH					
	Total Burials		With Artifacts		TOTALS	
Age	Shallow Graves 0-30"	Deep Graves 30-60"	Shallow Graves 0-30"	Deep Graves 30-60"	With Artifacts	Burials
0-6 yrs.	14	2	9	2		
6-12 yrs.	3	3	0	3		
12-21 yrs.	7	7	7	3		
21-45 yrs.	32	28	20	16		
+50 yrs.	9	8	4	2		
Unknown*			1	0		
TOTALS	65	48	41	26	67	113

*Burial No. 12.

TABLE 33

DISTRIBUTION OF GRAVE GOODS WITH SKELETONS IN VARIOUS BURIAL POSITIONS
UCAS EXCAVATION OF SJo-68

Possession of Artifacts	Burial Positions									
	EVW	EVO	EDW	EDO	ESW	ESO	FlexW	FlexO	Dis-turbed	Total
With	37	2	18	2		1		1	6	67
Without	18	3	9		2	1	1	5	7	46

TABLE 34

ARTIFACT DISTRIBUTION IN GRAVES BY DEPTH
UCAS EXCAVATION OF SJo-68

Depth	Possession of Artifacts.		Total
	With	Without	
0-30"	42	23	65
30-60"	25	23	48
Total	67	46	
Transitional zone 31-35"	8	4	12

TABLE 35

HORIZONTAL DISTRIBUTION OF GRAVES
WITH AND WITHOUT ARTIFACTS
UCAS EXCAVATION OF SJo-68

Possession of Artifacts	Horizontal Provenience				Total
	A-E	F-J	K-O	No Loc.	
With	14	30	18	5	67
Without	10	18	12	6	46
With Ochre Alone	2	4		1	7

TABLE 36

ARTIFACTS DISTRIBUTION ACCORDING TO SEX OF INTERMENT
UCAS EXCAVATION OF SJo-68

Possession of Artifacts	Sex		
	Male	Female	Unknown
With	31	14	22
Without	14	16	16
With Ochre Only	2	0	5

TABLE 37a

ARTIFACT DISTRIBUTION ACCORDING TO AGE
UCAS EXCAVATION OF SJo-68

Possession of Artifacts	Age						Total
	?	0-6	6-12	12-21	21-50	50+	
With	1	10	4	10	37	5	67
Without	0	4	4	3	25	10	46
Total	1	14	8	13	62	15	113

TABLE 37b

BURIAL POSITION ACCORDING TO AGE OF INTERMENT
UCAS EXCAVATION OF SJo-68

Burial Position	Age						Total
	0-6	6-12	12-21	21-50	50+	Unknown	
EVW	6	2	4	38*	6		56
EVO		1	1	3			5
EDW	2	3	7	10	5		27
EDO	1			1			2
ESW				2			2
ESO			1	1			2
FlexW					1		1
FlexO				3	3		6
Disturbed	5	2		5		1#	13
Disturbed additional burials in graves	2	1		9	2		14
EVW additional burials in graves			1	2			3
Total	16	9	14	74	17	1	131

*Two adult interments in burial no. 106 are counted as separate interments. One is an EVW male and the other an EDW female; both contain mortuary goods, red ochre and a projectile point.

#Burial no. 12 not categorized.

TABLE 38

DISTRIBUTION OF CHARMSTONES IN SJo-68
Windmiller Phase

	Phase 1		Phase 2			Phase 3						Phase 4					Phase 5
Depth in Inches	36-54"		30-36"			24-30"						10-24"					0-10"
Burial Number	23	24	6+	67	75	62a*	66	79	87	D24	73	10	12	88	D15	D16	D34
D9																	1
B3															1		
B1b3										(?)					1	6	
D8													1				
B5b						1								1			
B4b)												1					
) may																	
B1a3) be							1										
B1b1											1						
C1b									2		1						
C1a								1	3								
C1c					1												
C1d				4													
C2c		3						2									
C2b	2	17	?	3				3									
C2a	1	3			1												
C3a	1	1		1													
C3b	2	7															
C3c		1															
C4a1	1																
A5	1																

* Burial Number 62a may be intrusive from Phase 4.

+ Artifacts from Burial Number 6 were lost in a fire which destroyed the field camp.

TABLE 39

CHARMSTONE MATERIAL IN SJo-68[a]

	A5	B1a3	B1b1	B1b3	B3	B4b	B5b	C1a	C1b	C1c	C1d	C2a	C2b	C2c	C3a	C3b	C3c	C4a1	D8	D9	Unclass.	Total
Transluscent marble		1				1^{1}	2^{2}				2^{2}	11^{2}		1^{1}	2^{1}							
Serpentine					1^{1}								1^{1}	1^{1}								
Gabbro				1^{1}									2^{1}			1^{1}						
Schist	1^{1}		1^{1}	5^{1}				1^{1}				1^{1}	1^{1}			1^{1}						
Sandstone																1^{1}		1^{1}			1	
Claystone				1^{1}									3^{1}	1^{1}	1^{1}	2^{2}						
Altered or burned material												2^{2}	1^{1}	2^{1}		1^{1}	1^{1}					
Igneous or metamorphic rock				1				1^{1}	3^{2}	1^{1}	2^{1}		4^{3}	1^{1}								
Porphoritic Igneous								2^{1}			2^{1}		1^{1}			1^{1}						
Crystal and grain quartz													1^{1}						1^{1}	1^{1}		
Unknown material													1^{1}									
TOTAL	1^{1}	1^{1}	1^{1}	7^{2} +1	1^{1}	1^{1}	2^{2}	4^{2}	3^{2}	1^{1}	4^{1}	5^{3}	25^{4}	5^{2}	3^{3}	9^{2}	1^{1}	1^{1}	1^{1}	1^{1}	+1	77^{15} +2

[a]Materials partially identified by Drs. Richard Hay and Howel Williams of the University of California, Berkeley, Department of Geology.

+ = unassociated in the hardpan.

TABLE 40

PROJECTILE POINTS WITH GRAVE ASSOCIATION IN SJo-68

	Phase 5(?)						Phase 4																
Dawson's Grave Lot Number	35	29	12						25	43	8c	36	44	56	15			18	40		13	23	42a
UCAS Burial No.				73	17	19	22	82								39	103			58			
Depth	6-10"						10-24"																
Point Type 3a		1			1					1	2	1		1				1			1		
1	1								1						1						1		
2							1									1		1		1			
7d																							
7c						1																	
6c		1																					
6d																							
5c													1										
5d																							
3b	1		1		1																		
5a																		1					
7a				1																1			
9a																							1
frag.								1			2	1			2		1		2		1	1	
Totals																							
Dawson	2	2	1						1	1	4	2	1	1	3			3	2		3	1	1
UCAS				1	2	1	1	1								1	1			2			

TABLE 40 (continued)

PROJECTILE POINTS WITH GRAVE ASSOCIATIONS IN SJo-68

	Phase 4 (continued)								Phase 3										Phase 2				
Dawson's Grave Lot Number	9	30	45				17		28			6											
UCAS Burial No.				1	80	36		84		46	12		87	89	77	cr4	cr5	16	79	62a	42	105	33
Depth	10-24"								24-30"										30-36"				
Point Type																							
3a	1	1							1	1		2							1	2			
1					2		5			1		1	1	1						5	1		
2				1			1													2			
7d												1											
7c												1								2			
6c																	1			1			
6d	1																						
5c	1																						
5d												1											
3b																1	3					4	4
5a																	1						
7a					1									2			1	1		2			
9a																							
frag.			1			1		1		2	1	2			1	2	3		2	1			
Totals																							
Dawson	3	1	1				6		1			8											
UCAS				1	3	1		1		4	1		1	3	1	3	9	1	3	15	1	4	4

TABLE 40 (continued)

PROJECTILE POINTS WITH GRAVE ASSOCIATION IN SJo-68

	Phase 2 (cont.)					Phase 1										No Provenience					
Dawson's Grave Lot Number	26						27									14		63	67	70	71
UCAS Burial No.		75	6	78	37	106		60	70	91	23	24	cr1	cr3	29		N/N2				
Depth	30-36"					36-53"										No depth					
Point Type 3a		1																			
1														1						(1)	
2										1							1				
7d																					
7c																					
6c												1						(1)			
6d																					
5c											2		3								
5d																					
3b	1	1		3		1					1	1	7			1					
5a							1	1	1			2	3		1				(1)		
7a											1	1			2						
9a																					
frag.					1						1		4		1						(1)
Totals																					
Dawson	1						1									1					
UCAS		1		3	1	1		1	1	1	5	5	17	1	4		1				

Dawson grave lot 73 = 42b original notes.
Dawson grave lot 42 = 42a original notes.
Dawson grave lots 74 and 75 = 42c original notes.

Circled numbers are not in the collection but are recorded in Dawson's original field notes. They are not included in the totals.

TABLE 41

DISTRIBUTION OF POINTS BY AGE AND SEX
IN THE UCAS BURIALS, SJo-68

Age	No.	% of Burials With Points**	Sex	No.	% of Burials With Points*
0-6 yrs.	2	5.9	Male	18	47.4
6-12 yrs.	1	2.9	Female	7	18.4
12-21 yrs.	5	14.8	Sex unknown	13*	34.2
21-49 yrs.	22	64.8	Total graves	38	
50+	4	11.8			

* Including four cremations

** Not including four cremations

TABLE 42

RAW MATERIAL OF TOTAL PROJECTILE POINTS FROM SJo-68

Types	1	2	3a	3b	4a	5a	5c	5d	6c	7a	7c	7d	7e	9a	9b	Misc.	Fragments
Obsidian	34	28	47	38	1	13	8	1	7	8	1	1	1	3		2	108
Chert	2	1	2				1		3	5	5				1		5
Schist	5		1			3			1	3						1	7
Quartzite	2	1							1								4
Basalt	1					1											2
Petrified Wood	2																

TABLE 43

VERTICAL DISTRIBUTION OF UNASSOCIATED POINTS FROM SJo-68

	0-6"	6-12"	12-18"	18-24"	24-30"	30-36"	36-42"	42-48"	48-64"	No Loc.	Total
3a	1	1	10	4	7	1				9	33
1	1	1	3	4	3	2	1		1	8	24
2	2	4	5	3	1		1	1		5	22
6c		2		1	1		1			2	7
7c			1							1	2
7d											0
5c										3	3
5d										2	2
3b		2	1		1					3	7
7a		2			1				1	1	5
5a		3			1					5	9
9b									1		1
9a						1				1	2
4a										1	1
Miscellaneous				1			1			1	3
Fragment	5	17	17	4	9	2	2	1	2	40	98

TABLE 44

HORIZONTAL DISTRIBUTION OF UNASSOCIATED POINTS FROM SJo-68

Types	1	2	3a	3b	4a	5a	5c	5d	6c	7a	7c	7d	9a	9b	Misc.	Fragments
A-E	7	12	15	3		3			3	3	2		1			38
F-J	7	4	10	1		2			3	2				1	2	33
K-O	4	2	1	1	1	1	1									8
No Loc.	6	4	7			3	2	2	1				1		1	20
Totals	24	22	33	5	1	9	3	2	7	5	2	0	2	1	3	99

TABLE 45

VERTICAL DISTRIBUTION OF OBSIDIAN AND NON-OBSIDIAN POINTS, SJo-68.

	Points in Graves		Unassociated Points	
	Obsidian	Non-obsidian	Obsidian	Non-obsidian
0-6	2		8	
6-12	6	1	31	1
12-18	16	5	34	4
18-24	13	6	24	3
24-30	21	19	21	4
30-36	18	12	4	2
36-42	7		4	1
42-48	25	1	2	1
48-54	4	1	1	1
54-60	1		2	1
Unknown	2		72	6

TABLE 46a

BONE TOOLS IN SJo-68 UCAS GRAVES

UCAS BURIAL NOS.	Antler Flaker	Teeth	Claws	Birdbone Tube	Bird Wishbone	Misc. Bone	Bone Awls	Antler Points	Gorge Hook	Bone Points	Beaver Mandible	Bone Fishhook	Antler Wand	Sweat Scraper	Canis Skull	Charmstones	Points	Ochre	Shell Beads	Shell Urns	Slate Rods	Quartz Crystals
Phase 5																						
22 (11")	1																1	X				
Phase 4																						
5 (19")							1															
86 (19")		6																				
88 (22")					1											1	4		3?	2		16
84 (23")			1														1			11		
Phase 3																						
73 (28")	1						1									2				36		11
																			47 (H)			
62a# (32")			1		1	1	1									1	15		391 (O)	4	1	5
Phase 2																						
9 (35")		1									1											
																			97 (H)			
67 (36")							1									8		X	123 (O)			5
6 (37")				1	1		1	6	1		2	1				1						
Phase 1																						
49 (44")											1		1					X	20? (H.1a)	8		
60 (44")							2										1	X	60 (H.1a)			
51 (46")														1					21 (H.b)	5		
38 (47")															1							
Cr1 (50")							1	6		1							18					
No. of Bur.	2	2	2	1	3	2	7	2	1	1	3	1	1	1	1	5	6	4	6	6	1	4
No. of Spec.	2 T	7 C	2 C	1 C	3 C	3 T	8 T	12 T	1 T	1 T	3 C	1 T	1 C	1 C	1 C							

T = Tool. C = Ceremonial object.

TABLE 46b

BONE TOOLS IN DAWSON'S GRAVE LOTS, SJo-68

DAWSON'S GRAVE LOTS		Bone Chisel Gouge	Turtle Shell	Antler Flaker	Teeth	Claws	Bird Wishbone	Miscellaneous Worked Bone	Awls	Birdbone Tubes	Bone Points	Beaver Mandible	Points									Quartz Crystals	Pencils	Shell Beads	Shell Ornaments
													1	2	3a	3b	5a	7d	7c	5c	Fragments				
8"	12		1													1							4		
10"	47		1																						
11"	11				1																			165 O. 2b 120 H. 1a 112 O. 1a	2
11"	20				20																				
12"	38						64																	239 O. 1a 125 H. 1a	20
12"	39						1	1																	
12"	53	1																							
12-24"	60				1																				
12"	62		1			1			1															7 H. 1a 350 O. 1a	5
16"	50	1																							
16"	40				5																2	1		1 O. 1a	
16"	18	2	1											1	1		1							3 O. 1a	
18"	61		1																					40 O. 1a 14 H. 1a	2
18"	57				2																				
18"	13											1	1	1							1			927 O. 1a	2

TABLE 46b (continued)

BONE TOOLS IN DAWSON'S GRAVE LOTS, SJo-68

DAWSON'S GRAVE LOTS		Bone Chisel Gouge	Turtle Shell	Antler Flaker	Teeth	Claws	Bird Wishbone	Miscellaneous Worked Bone	Awls	Birdbone Tubes	Bone Points	Beaver Mandible	Points									Quartz Crystals	Pencils	Shell Beads	Shell Ornaments
													1	2	3a	3b	5a	7d	7c	5c	Fragments				
18"	2									3												9			
18"	23							1																188 O. 1a 322 H. 1a	5
18-20"	17				1				1				5	1								21		1 H. 1a	
24"	28								1						1										
27"	6				11								1		2			1	1	1	2			510 O. 1a	32
36"	22					2																2		48 H. 1a	
42"	27				2												1								
?	66								1																
?	14								2	1						1								40 H. 1a	40
Total Burials		3	5	0	8	2	2	2	7	2	0	1	3	3	3	2	2	1	1	1	4	4	1	12	8
Total Specimens		4	5	0	43	3	65	2	8	4	0	1	7	3	4	2	2	1	1	1	6	3	4	3,207	108

TABLE 47

SHELL BEADS AND ASSOCIATED ORNAMENTS IN DAWSON GRAVE LOTS, SJo-68.

Depth	Dawson's Grave Lot Numbers	Beads					Ornaments																						
		Olivella 1a medium	Olivella 1a small	Olivella 2b	Haliotis 2	Haliotis 1a	C.(2).a	B.1	C.(1)	C.(1).1	C.(2)	C.(2).a	M.F.3	M.E.2	M.E.1	C.(1).c	C.(1).a	C.1	C.3	C.1.n	C.(1).1.a	B.(2).1.1	Amorph. 2.a	B.1.a	B.(1).1	B.1.1	B.2	C.(1).2.a	H.2
Phase 5																													
6"	55				3	25	1																						
8"	32	1	23																										
10"	52		175					2	3	1	4	2	1		1														
10"	21		1						1	1																			
10"	8		136			42																							
11"	11			156		120					1																		
12"	31	3	12	1	3	1																							
12"	38	6	233			125				1	9	4							1										
12"	48			476																									
12"	62		350	1																1									
Phase 4																													
15"	15		187																										
16"	18	3																											
16"	33		322	564		7																							
16"	37		41								4	3																	
16"	40		1																										
18"	3			293		383																							
18"	9		10			230					2			1		1	1	1	1		1								
18"	10		10	10		3															3								
18"	13					927																							
18"	23		188			322			1		2	2																	

TABLE 47 (continued)

SHELL BEADS AND ASSOCIATED ORNAMENTS IN DAWSON GRAVE LOTS, SJo-68.

Depth	Dawson Grave Lot Numbers	Beads					Ornaments																					
		Olivella 1a medium	Olivella 1a small	Olivella 2b	Haliotis 2	Haliotis 1a	C.(2).a	B.1	C.(1)	C.(1).1	C.(2)	C.(2).a	M.F.3	M.E.2	M.E.1	C.(1).c	C.(1).a	C.1	C.3	C.1.n	C.(1).1.a	B.(2).1.1	Amorph. 2.a	B.1.a	B.(1).1	B.1.1	B.2	C.(1).2.a	H.2
Phase 4 (con't.)																													
18"	30					1																							
18"	41			78		50					36	8																	
18"	49		336		21										1							2							
18"	51		614																										
18"	61		40			14					2																		
18-20"	17					1																							
24"	4					459																							
24"	5		71			647			3		6	7					1	1					1						
24"	7		62								6	7																	
24"	(42c) 74	965	2,407																										
Phase 3																													
24"	(42c) 75			5	1			111	1		4	6						1						1	31	3	1		
27"	6		510					1	2	1	13	9					2	2									1		
30"	24		1																										1
36"	22			48																									
?	14		112			42					2	2								1									

TABLE 48

SHELL BEADS AND OTHER ASSOCIATIONS IN DAWSON GRAVE LOTS, SJo-68.

Depth	Dawson's Grave Lot Numbers	Points									Charmstones B1b1 and B3	Clay Pecan	Crystals	Ochre	Slate Rods	Ground Obsidian Awl	Mortar	Stone Disc	Mica Ornaments	Asbestos Splinters	Slate Pendant	Bone
		3a	1	2	7d	7c	6c	5c	5a	Fragment												
6"	55																					
8"	32															1						
10"	52																					
10"	21																					
10	8(a)																					
11"	11																					Teeth
12"	31												2									
12"	38																					64 Bird wishbones
12"	48																					
12"	62																					1 Turtleshell 1 Claw 1 Awl
15"	15		1								2	1										
16"	18	1		1					1													1 Bone chisel 1 Turtleshell 1 Awl
16"	33													1								
16"	37																					
16"	40												1									5 Teeth
18"	3																					
18"	9	1					1	1					6	1				1				

TABLE 48 (continued)

SHELL BEADS AND OTHER ASSOCIATIONS IN DAWSON GRAVE LOTS, SJo-68.

Depth	Dawson's Grave Lot Numbers	Points									Charmstones B1b1 and B3	Clay Pecan	Crystals	Ochre	Slate Rods	Ground Obsidian Awl	Mortar	Stone Disc	Mica Ornaments	Asbestos Splinters	Slate Pendant	Bone
		3a	1	2	7d	7c	6c	5c	5a	Fragment												
18"	10																					
18"	13	1	1							1		1					1	1				1 Beaver mandible
18"	23											1										1 Misc. bone
18"	30	1																				
18"	41																					
18"	49																					
18"	51																					
18"	61																					
18-20"	17												21									1 Tooth 1 Awl
24"	4											2										
24"	5																					
24"	7												1		16				5	6	1	
24"	74																					
24"	75																					
27"	6	2	1		1	1		1		2												11 Teeth
30"	24										2(?)		16									
36"	22												2									2 Claws
?	14	1										1										2 Awls 1 Birdbone tube

TABLE 49

SHELL BEADS AND OTHER ASSOCIATIONS IN U.C.A.S. GRAVES, SJo-68.

	Phase 5				Phase 4				Phase 3					Phase 2							Phase 1				
Depth - Inches	10"	12"	12"	13"	18"	18"	22"	23"	26"	27"	28"	28"	29"	30"	31"	32"	33"	34"	36"	36"	40"	44"	44"	44"	46"
UCAS Bur. No.	19	59	82	3	45	104	88	84	10	96	111	73	16	32	79	62a	65	92	67	75	50	49	60	71	51
Olivella 1a small	125	13		1	147	13					1		1			46	35		29						1
Olivella 1a medium												1			4		30		68	1				96	
Olivella 2b	65								47							1									
Haliotis 3								4																	
Haliotis 2					1	2				2															
Haliotis 1a			2			80	3	1				35		89	60	391	31	84	123	2	100	20	60		21
POINTS																									
7c	1															1									
3a															1	2				2					
1																5									
2																2									
6c																1									
7a													1			2									
5a																								1	
Fragments			1					1							2	1									
CHARMSTONES																									
B5b							1									1									
B4b									1																
B1b1												1													
C1b												1													
C1a															1										
C1c																					1				

TABLE 49 (continued)

SHELL BEADS AND OTHER ASSOCIATIONS IN U.C.A.S. GRAVES, SJo-68.

	Phase 5				Phase 4				Phase 3					Phase 2							Phase 1				
Depth - Inches	10"	12"	12"	13"	18"	18"	22"	23"	26"	27"	28"	28"	29"	30"	31"	32"	33"	34"	36"	36"	40"	44"	44"	44"	46"
UCAS Bur. No.	19	59	82	3	45	104	88	84	10	96	111	73	16	32	79	62a	65	92	67	75	50	49	60	71	51
CHARMSTONES (continued)																									
C2c															1										
C2b															1				3						
C1d																			1						
C2a																				1					
C3a																			1						
Quartz crystal	2				32		16	11								5	1		10						
BONE																									
Bird wishbone							1									1									
Claws								1																	
Antler flaker												1													
Awl												1				1			1						
Teeth																1									
Beaver jaw																						1			
Antler "wand"																						1			
Sweat scraper																									1
Miscellaneous worked bone																1									
Ochre			X										X				X		X*			X	X		
SHELL ORNAMENTS																									
B.2	1							1									2								
C.(2).a	1				3					7												6			5
F.2	1																4								

TABLE 49 (continued)

SHELL BEADS AND OTHER ASSOCIATIONS IN U.C.A.S. GRAVES, SJo-68.

	Phase 5				Phase 4				Phase 3					Phase 2							Phase 1				
Depth - Inches	10"	12"	12"	13"	18"	18"	22"	23"	26"	27"	28"	28"	29"	30"	31"	32"	33"	34"	36"	36"	40"	44"	44"	44"	46"
UCAS Bur. No.	19	59	82	3	45	104	88	84	10	96	111	73	16	32	79	62a	65	92	67	75	50	49	50	71	51
SHELL ORNAMENTS (continued)																									
H.2	1																								
B.(1).1					1					2															
C.(2)					4	5	2	1		12						3									
C.(1)						2									1										
C.1						1																			
C.(1).1						1																			
M.E.(1).1						1																			
B.1								3																	
B.2.a								1																	
C.(1).a									1																
F.1																	1								
Segment C.(1).a																									1

*Two red bands painted across the back of the femora.

TABLE 50

HALIOTIS ORNAMENTS BY GRAVE, SJo-68.

Dawson's Grave Lot Numbers	U.C. Bur. Nos.	B.1	B.1.a	B.(1).1	B.1.1	B.2	B.2.a	B.1.1.1.1	B.2.(1).1	C.(1)	C.(1).a	C.(1).n	C.(1).c	C.1	C.(1).1	C.(1).1.a	C.(2)	C.(2).a	C.3	C.(2).1	C.(1).2.a	C.(1).n segment
Phase 5																						
6" 55																		1				
10" 8											1			1			2					
10" 21										1					1							
10" 52		2								3					1		4	2				
	10" 19					1												1				
Phase 4																						
11" 11																	1					
12" 31									1									1				
12" 38															1		9*	4	1			
12" 54										1				1			7	2				
12" 62												1										
	13" 97																5			1		

TABLE 50 (continued)

HALIOTIS ORNAMENTS BY GRAVE, SJo-68.

Dawson's Grave Lot Numbers	U.C. Bur. Nos.	B.1	B.1.a	B.(1).1	B.1.1	B.2	B.2.a	B.1.1.1.1	B.2.(1).1	C.(1)	C.(1).a	C.(1).n	C.(1).c	C.1	C.(1).1	C.(1).1.a	C.(2)	C.(2).a	C.3	C.(2).1	C.(1).2.a	C.(1).n segment
Phase 4 (cont.)																						
16" 37																	4	3				
	16" 48				7			1														
	16" 58																	2				
18" 9											1		1	1		1	2		1			
18" 10																3						
18" 23										1							2	2				
18" 41																	36	8				
18" 49									2													
18" 61(8b)																	2					
	18" 45			1													4	3				
	18" 104									2				1	1		5					
	22" 88																2					

TABLE 50 (continued)

HALIOTIS ORNAMENTS BY GRAVE, SJo-68.

Dawson's Grave Lot Numbers	U.C. Bur. Nos.	B.1	B.1.a	B.(1).1	B.1.1	B.2	B.2.a	B.1.1.1.1	B.2(1).1	C.(1)	C.(1).a	C.(1).n	C.(1).c	C.1	C.(1).1	C.(1).1.a	C.(2)	C.(2).a	C.3	C.(2).1	C.(1).2a	C.(1).n segment
Phase 3																						
	23" 84	3				1	1										1					
24" 5											1			1	3		6	7				
24" 7																	6	7				
24" 75		111	1	31	3	1				1							4	6				
	26" 10										1											
27" 6		1								2	2			2	1		13	9			1	
	27" 96			2													12	7				
Phase 2																						
30" 24																						
	31" 79									1												
	32" 62																3					
	33" 65					2																

TABLE 50 (continued)

HALIOTIS ORNAMENTS BY GRAVE, SJo-68.

Dawson's Grave Lot Numbers	U.C. Bur. Nos.	B.1	B.1.a	B.(1).1	B.1.1	B.2	B.2.a	B.1.1.1.1	B.2.(1).1	C.(1)	C.(1).a	C.(1).n	C.(1).c	C.1	C.(1).1	C.(1).1.a	C.(2)	C.(2).a	C.3	C.(2).1	C.(1).2.a	C.(1).n segment
Phase 1																						
	44" 49																	6				
	46" 51																	5				1
	18" 85	1		3						1		2		1	2							
No depth 14										1							2	2				
No depth 65															1							
	N/N2										1											

TABLE 50 (continued)

HALIOTIS ORNAMENTS BY GRAVE, SJo-68.

Dawson's Grave Lot Numbers	U.C. Bur. Nos.	F.1	F.2	F.2.a	M.F.(2)	M.F.3	M.F.2	H.2	H.3	M.E.1	M.E.(1).1	M.E.(2)	M.E.2	M.B.1	Amorph. 1	Amorph. 2.a
Phase 5																
6" 55																
10" 8																
10" 21																
10" 52						1				1						
	10" 19		1					1								
Phase 4																
11" 11																
12" 31																
12" 38																
12" 54																
12" 62																
	13" 97															

TABLE 50 (continued)

HALIOTIS ORNAMENTS BY GRAVE, SJo-68

Dawson's Grave Lot Numbers	U.C. Bur. Nos.	F.1	F.2	F.2.a	M.F.(2)	M.F.3	M.F.2	H.2	H.3	M.E.1	M.E.(1).1	M.E.(2)	M.E.2	M.B.1	Amorph. 1	Amorph. 2.a
Phase 4 (cont.)																
16" 37																
	16" 48								1							
	16" 58															
18" 9													1			
18" 10																
18" 23																
18" 41																
18" 49										1						
18" 61																
	18" 45															
	18" 104										1					
	22" 88															

TABLE 50 (continued)

HALIOTIS ORNAMENTS BY GRAVE, SJo-68.

Dawson's Grave Lot Numbers	U.C. Bur. Nos.	F.1	F.2	F.2.a	M.F.(2)	M.F.3	M.F.2	H.2	H.3	M.E.1	M.E.(1).1	M.E.(2)	M.E.2	M.B.1	Amorph. 1	Amorph. 2.a
Phase 3																
	23" 84															
24" 5																1
24" 7																
24" 75				2				1				1		1	1	
	26" 10															
27" 6																
	27" 96															
Phase 2																
30" 24								1								
	31" 79															
	32" 62															
	33" 65	1		4												

TABLE 50 (continued)

HALIOTIS ORNAMENTS BY GRAVE, SJo-68.

Dawson's Grave Lot Numbers	U.C. Bur. Nos.	F.1	F.2	F.2.a	M.F.(2)	M.F.3	M.F.2	H.2	H.3	M.E.1	M.E.(1).1	M.E.(2)	M.E.2	M.B.1	Amorph. 1	Amorph. 2.a
Phase 1																
	44"															
	49															
	46"															
	51															
	18"															
	85															
No depth																
14																
No depth																
65																
	N/N2															

* 1-55156 has a Haliotis 1a bead glued on edge.

TABLE 51

OTHER ASSOCIATIONS OF U.C.A.S. GRAVES WITH HALIOTIS ORNAMENTS.. SJo-68.

U.C. Burial Nos.	Depth in Inches	Sex			Burial Position			Age					Shell Beads	Charmstones					Points						Fragments	Quartz Crystals
		Male	Female	Unknown	EVW	EDW	Disturbed	0-6	6-12	12-21	21-50	50+		B5bc	B4b	C1a	C2c	C2b	7c	2	7a	3a	1	6c		
Phase 5																										
19	10"		X		X						X		X						1							2
Phase 4																										
97	13"	X				X					X															
48	16"	X			X							X														19
58	16"	X			X						X									1	1					1
45	18"	X			X						X		X													32
104	18"			X			X				?		X													
88	22"		?		X					X			X	1												16
Phase 3																										
84	23"	X			X						X		X		1										1	11
10	26"	X			X						X		X													
96	27"	X			X							X	X													
Phase 2																										
79	31"	X			X						X		X			1	1	1				1			2	
62a	32"	X			X						X		X	1					2	2	2	2	5	1	1	5
Phase 1																										
65	33"			X		X			X				X													1
49	44"	X				X					X		X													
51	46"	X			X						X		X													
85	48"	X			X						X															
N/N2	?			X			X																			

TABLE 52

QUARTZ CRYSTALS IN SJo-68 GRAVES

	Phase 5		Phase 4											Phase 3			Phase 2					
Dawson's Grave Lot Numbers	6" 34			12" 62(8c)	12" 1	12" 31	16" 33	16" 40			18" 9		18-20" 17			24" 7	24" 19	30" 24				36" 22	
U.C. Burial Numbers		10" 19	11" 11						16" 48	16" 58		18" 45		22" 88	23" 84				32" 66	32" 62a	33" 65		36" 67
Total Quartz Crystals	19	2	14	1	9	1	1+	1+	19	1	8	33	21	16	11	1	41	16	1	5	1	2	10
>30 mm long	9*	2	3?		2	1					2		4	3	3	1	4	2	1	5		1	
15-30 mm long	9		8?	1	6				19	1	4		17	13	8		35	13				1	5
0-14 mm long					1							33					2	1					5
Shell ornaments#		4		1					9	2	8	7		2	5	13		1		3	7		
Shell beadsØ		190		351			893	1			240	148	1	3	5	62		1		438	96	48	220
Charmstones																							
D9	1																						
B5b													1							1			
B1a3																			1				
C1d																							4
C2b																							3
C3a																							1
Points																							
7c		1																		2			
3a				2																2			
2										1										2			
7a										1										2			
1																				5			
6c																				1			
Fragments				2				2							1					1			
Worked bone								5					2	1	1					4			1

*One specimen 100 mm long and length unknown. #See Table 49. ØSee Table 47a.

TABLE 53

OCHRE IN SJo-68 GRAVES

	Phase 4						Phase 3		Phase 2				Phase 1										
Depth	11"	12"	13"	15"	16"	20"	27"	29"	32"	32"	33"	36"	37"	37"	44"	44"	44"	44"	45"	47"	47"	47"	53"
University of California Burial Nos.	22	82	14	39	58	43	21	16	52	66	65	67	37	63	107	49	60	70	13	23	24	25	29
Female	?	?						X[1]		X					X								?
Male				X	X		X		X			X	X			X	X	X		X	X		
Unknown or questionable			X			X		X[2]			?			X					X			X	
Age	19-24	50+	25-45	24-30	25-45	1 yr.	19-24	25-45 5-7[2]	25-45	25-45	6-12	25-45	40-50	12-16	25-45	25-45	25-45	21-30	15-18	18-21	21-25	18-21	21-25
Position																							
E.V.W.	X	X	X		X					X										X	X		X
E.D.W.				X				X[1]			X	X			X	X	X	X	X				
E.D.O.						X	X		X				X									X	
Disturbed								X[2]						X									
Ochre Dist.																							
On head		X							X				X	X			X		X		X		
On body			X	?			X	X[2]	X		X					X		X	X		X	?	?
Small amt. on limb	X				X					X					X			X		X			
Painted bands on femora												X											
Total points*	1	1		1	2			1					1				1	1		5	5		5
Charmstones*												8								15	32		
Shell ornaments*					X						X					X							
Qtz crystal*					1					1													
Beads		X						X			X	X				X	X						
Bone	1											1				2	3						

* For further breakdown into types see appropriate tables.

TABLE 54

HORIZONTAL AND VERTICAL DISTRIBUTION OF BAKED-CLAY OBJECTS. SJo-68.

	Clay Objects					
	Round	Cylin-drical	Biconical	Disc	Pecan	Pots
Depth						
No loc.	2	2	3	10	3	2
0-11"			2	1	1	
12-23"		1		5	4	
24-35"			1	1		
36-47"	2	1	1	3	2	
48-59"	2		2			
60+"				2		1
Horizontal Provenience						
A-E	2	1	4	16	7	2
F-J	4	1	2	4	1	1
K-O	1	2	2	2		
No loc.	1		1		2	

Items may have vertical provenience but no noted horizontal provenience. In that case, the item is included in the vertical distribution and is omitted from the horizontal distribution.

TABLE 55

HORIZONTAL AND VERTICAL DISTRIBUTION OF BAKED-CLAY FRAGMENTS, SJo-68.

Horizontal Provenience	Depth					No. Location and Surface
	6-11	12-23	24-35	36-47	48-70	
A-E		3	20		10	103
F-J		4	2	6	1	29
K-O		8	9	4	36	24
No loc.	1				1	32

TABLE 56

VERTICAL DISTRIBUTION OF SURFACE-IMPRESSED BAKED-CLAY FRAGMENTS, SJo-68.

Surface Impression	6-11	12-23	24-35	36-47	48-70	No location and surface
Basketry				3	4	19
Cord or Twine				1	1	6
Twigs or Matting					2	1
Fingernails		3	2	1	2	18
Finger Holes						10
Incised Lines			2			2
Smooth		12	43	3	39	133

TABLE 57

HORIZONTAL AND VERTICAL DISTRIBUTION OF MORTARS AND METATES, SJo-68.

Location	No Depth	D E P T H 0-12"	12-24"	24-36"	36-48"	48-60"
A-E	2		Feature (nos.6,7)/8			1
F-J	1		1	Feature (nos.10,12)/2		
K-O	1		2	4	1	Feature (no.22)/2
No loc.	12					

TABLE 58

HORIZONTAL AND VERTICAL DISTRIBUTION
OF MANOS AND PESTLES, SJo-68.

	A-E	F-J	K-O	No Location
0-12"	2			
12-24"	1	1 (burial no. 23)	1 (burial no. 80)	
24-36"	2	2 (burial nos. 62a and 73)		
36-48"				
48-60"	1 (cremation no. 1)		1	
no depth	1		3	

TABLE 59

HORIZONTAL AND VERTICAL DISTRIBUTION OF WASTE:
FLAKES, FLAKE FRAGMENTS, PEBBLES, SCRAPERS AND CHOPPERS, SJo-68.

	A-E				F-J				K-O				No Location			
	Flake	Pebbles	Scraper	Chopper	Flake	Pebbles	Scraper	Chopper	Flake	Pebbles	Scraper	Chopper	Flake	Pebbles	Scraper	Chopper
0-12				1	1						10					
12-24			1	1			3	1								
24-36	3					5		1	1		1					
36-48			1					1								
48-60			1													
60+												2				
No loc.	24	17	1	2	9	7	2		3	2		1	3	5	3 UCAS* 2 Dawson	1

* UCAS = University of California Archaeological Survey.
Dawson = Dawson SJo-68 Collections.

TABLE 60

WASTE RAW MATERIALS, SJo-68.

	Petrified Wood	Chert	Quartz	Basalt	Schist	Igneous	Obsidian	Questionable
Flakes		19		1	4	13	9	
Chunks		8			1	1		
Pebbles	1	6	11		3	16		1
Choppers		8		2		1		
Scraper		13		2	1	1	2	1
Cores		1					1	

TABLE 61

NUMBERS OF GRAVES IN EACH PHASE
Site SJo-68

Phase	UCAS Graves	Dawson Graves	Total Graves
5	9	12	21
4	30^{+1}	$58^{(?)}$	89
3	18^{+1}	2	21
2	15^{+3}	2	20
1	41	1	42
TOTAL	113^{+5}	75	188^{+5}

+ = Cremations

TABLE 62

ALL IDENTIFIABLE POINTS WITH DEFINITE PROVENIENCE
IN THE WINDMILLER CULTURE

Point Types	Sites						
	SJo-142	Sac-107C	SJo-68B*	Sac-168B	SJo-68A*	SJo-56	SJo-112
1	2		3	2	35	6	
2	3	8	3	2	22	3	3
3a	1	8	1	3	42	3	1
3b		6	27	1	7		
5a	8	11	8	6	5	19	4
5b				1	3		
5c			3				
5d			1	2			
5e	1			1	1	2	
6a	1	1					
6b	1						
6c	1		3		7	7	
7a	4	12	6	1	9	10	1
7b	2	1		1		4	
7c		1		1	5	9	
7d					1		
9a			1		1	1	
9b			1				
Totals	24	48	57	21	138	64	9

Note: The statistical method used refers to these numerous categories of variables for each site as "multinomial populations." SJo-112 is not included in the analysis because the site contains too few points.

*SJo-68A = hardpan(0-30", Phases 5, 4, and 3).
*SJo-68B = brown midden (30" - 60", Phases 2 and 1).

TABLE 63a

FREQUENCY OF MORTUARY GOODS IN GRAVES OF WINDMILLER COMPONENTS[1]

	SJo-68	SJo-68 Dawson's Records	Sac-107C	Sac-168B	SJo-56	SJo-142	SJo-112
Total Burials	113[2]	75	60	25	73	49	50 (?)
Graves w/artifacts	67	66	55	13	48	35	36
Graves w/out artifacts	46	9 (known)	5 (known)	12	25	14	14 (known)
Burial Position							
Extended ventrally	61		46	20	71	43	31
Extended dorsally	28		?	4		2	4
Extended on side	4			1			
Flexed	7		4				4
Disturbed	13		6	1	2	4	11
Orientation							
West/SW	80	75 (?)	46	22	72	46	39
Other than West	27		4	2		3	
Unknown	6		20	1	1		11
Cremations	5		1				
Isolated Skulls	2	25	1				3

[1] Multiple burials have been ignored in the above comparisons; therefore, some dorsal and disturbed burials have not been recorded, as well as many burials without artifacts. F. Dawson estimated that 50% of his graves did not contain artifacts.

[2] See Table 62 for breakdown into Phases.

TABLE 63b

DISTRIBUTION OF ARTIFACTS IN WINDMILLER CULTURE SITES
(Number of graves containing each type)

	SJo-68 Components				Sac-107C	SJo-168		SJo-56	SJo-142	SJo-112
	1	2	3	4/5		b_1	b_2			
Stone ball (ground)								3		
Perforated baked clay disc										
Baked clay "pecan"			4	12						
Baked clay pot	3#					1				
Stone beads					1				1	
Conical pipe									2	
Slate pendant				1				2		3
Slate rods	1		2	3	7		1			6
Quartz crystals			6	17	12			15	15	1
Unworked pebbles					1				7	
Zincblende fragments		1		1						
Mica ornament		1		2	2					2
Asbestos splinters				2	2					1
Obsidian bangles				1	3					
Stone atlatl spur										1
Pestle	X#	X#	X#	X#						
Mano	X#	X#	X#	X#					X#	
Mortar	X#	X#	2X#	X#			1			
Rectangular paint palette					1					
Ochre	11	4	2	8	5		2	5	6	3
Ground stone discs				2						
Bone or horn spatulas*	1			1*	3*			1		
Worked antler tines			1	1	4					2
Bone awls	2	2	2	4	7			4	2	3
Bird wishbones			1	3	2			1	1	1
Bird bone tubes				3	5			1	2	
Human fibula dagger								1		
Human skull recepticle				1#	1					

TABLE 63b (continued)

DISTRIBUTION OF ARTIFACTS IN WINDMILLER CULTURE SITES
(Number of graves containing each type)

	SJo-68 Components				Sac-107C	SJo-168		SJo-56	SJo-142	SJo-112
	1	2	3	4/5		b_1	b_2			
Bone beads									1	
Bone or horn chisel or gouge				3#						
Falcon skull									1	
Canis skull	1									
Beaver mandible	1	2		1				1		
Teeth (drilled*)										
Elk molars		1	2	7	2*			2		
Bear or falcon claws		1	1	2				1		
Antler "wand"	1									
Gorge hook		1			1			1		
Bone fishhook		1								
Bone or antler points	1	1								
Turtle shell pendants				5		1		1		
Miscellaneous bone tools			1	2	1	4				3
Beads					39	4		21	26	26
Olivella 1b								2		3
3e										1
3b					3				1	
2b		1	3	9	9	2		7	8	3
1a	2	5	5	27	16	2	2	8	10	11
Haliotis 3				1	4				2	4
2			1	6	4			3		7
1a	4	7	1	22	27			14	20	25
Square bead mussel shell								2		

- occurs unassociated in the mound matrix.

TABLE 64

WINDMILLER CULTURE PROJECTILE POINTS FOUND IN GRAVES

	Equivalent to SJo-68 Components					SJo-68 2,4,5	SJo-68 5(?)	SJo-68 ? 3,4,5				SJo-68 4/5	SJo-68 5
	SJo-68 Early ---------- Late							SJo-56 Early ---------- Late					
	1	2	3	4	5	Sac-107C	Sac-168	E	D	C	B	SJo-142	SJo-112
3a		1^{1}	7^{5}	9^{8}	2^{2}	2^{2}			2^{1}			1	1
1	1^{1x}		10^{6}	9^{4}	2^{2}				1^{1}		1^{1}	2	1
2	1^{1x}		2^{1}	7^{6}	1^{1}	4^{4}			2^{1}			1	
7d			1^{1}									1	
7c			3^{2}		1^{1}				5^{1}		5^{2}		
7b											2^{1}	1	
6a												1	
6c	1^{1}		2^{2}		1^{1}	1^{1}			3^{2}		2^{1}	1	
6d				1^{1}									
5c	5^{2}			2^{2}				1^{1}					
5d			1^{1}					1^{1}				2	
5e					1						2^{2}	1#	
7a	4^{3}		6^{4}	2^{2}	1^{1}	5^{5}			5^{2}		2^{1}	3	
3b	9^{3}	10^{5}	4^{2}		$3^{3?}$								1
5a	9^{6}		(1^{1})	(1^{1})		8^{4}		1^{1}	(6^{2})		(10^{4})	(5)	1
9a				2^{2}									
Fragment	6^{3}	1^{1}	14^{8}	16^{11}	1^{1}	$?^{5}$			$?^{1}$			4	
Large ceremonial blade*						1^{1}							

Contains only one identifiable 3b point associated with a burial. The rest are fragments.

Superscript = number of graves. x = probably intrusive. ( ) = may be 7a or need reclassifying.
# = much larger and cruder than the midden specimen from SJo-68. ? = may be new type.
* = one very large ceremonial blade in Sac-107C is unique.

TABLE 65

CHARMSTONES IN THE WINDMILLER SITES

	SJo-68 Components				SAC-107C	Midden SAC-107C	SAC-168			SJo-56(1)				SJo-142B	SJo-112
	1	2	3	4/5			Midden SAC-168	b2	b1	E	D	C	B - No Charmstones		
Phase 5															
#F1						+1									
#D5					$1\frac{1}{}$										
#D4						+1									
#E3												$1\frac{1}{}$			
E1 ✓					$1\frac{1}{}$	+1	+1							+1	
Unclass.												+1			
E2 ✓					$2\frac{1}{}$		+2								
#D6						+1									
#D3					$1\frac{1}{}$										
#D2												$1\frac{1}{}$			
D1b ✓															$1\frac{1}{}$
#D1a					$1\frac{1}{}$										
*C5						+2									
#C4b						+1									
#C4a2					$1\frac{1}{}$										
#B7															$3\frac{3}{}$
*B6						-1									$3\frac{2}{}$
#D9				$1\frac{1}{}$											

TABLE 65 (continued)

CHARMSTONES IN THE WINDMILLER SITES

	SJo-68 Components				SAC-107C	Midden SAC-107C	SAC-168			SJo-56				SJo-142B	SJo-112
	1	2	3	4/5			Midden SAC-168	b2	b1	E	D	C	B - No Charmstones		
Phase 4															
*A1b2					$3\frac{3}{-}$										
A1b1					$1\frac{1}{-}$	-1	-4 +2		$5\frac{4}{-}$			$1\frac{1}{-}$			
B2					$9\frac{6}{-}$	+2									
B3				$1\frac{1}{-}$	$9\frac{2}{-}$	+1									
#D7											$1\frac{1}{-}$				
#D8				$1\frac{1}{-}$											
B4a					$1\frac{1}{-}$				$1\frac{1}{-}$					$1\frac{1}{-}$	
*B5a											$3\frac{1}{-}$				
B5b			$1\frac{1}{-}$	$1\frac{1}{-}$							-1				
B4b				$1\frac{1}{-}$							$1\frac{1}{-}$				
#A4b(2)					$1\frac{1}{-}$										
#A4a					$1\frac{1}{-}$										
*A3a							+1								
A3b					$4\frac{3}{-}$	-1	+1								
A3c					$3\frac{2}{-}$	+1	+1	$1\frac{1}{-}$							
A2b					$6\frac{3}{-}$		-1								
*A2a2					$3\frac{2}{-}$	+1									

TABLE 65 (continued)

CHARMSTONES IN THE WINDMILLER SITES

	SJo-68 Components				SAC-107C	Midden SAC-107C	SAC-168			SJo-56				SJo-142B	SJo-112
	1	2	3	4/5			Midden SAC-168	b2	b1	E	D	C	B - No Charmstones		
Phase 4 (continued)															
A2a1					$5^{\underline{2}}$		+4 -4	$1^{\underline{1}}$							
B1b3				$7^{\underline{2}}$	$10^{\underline{5}}$	+1 -1	+3 -1	$3^{\underline{1}}$			$1^{\underline{1}}$			$2^{\underline{2}}$	
B1a1 ✓								$1^{\underline{1}}$		$5^{\underline{4}}$	$1^{\underline{1}}$				
Phase 3															
B1a2							-1			$4^{\underline{2}}$					
*B1b2 ✓								$4^{\underline{2}}$							
B1b1 ✓			$1^{\underline{1}}$		$1^{\underline{1}}$										
B1a3 ✓			$1^{\underline{1}}$			+1		$2^{\underline{2}}$		$2^{\underline{1}}$					
A1a					$7^{\underline{5}}$	+1		1^{1}							
*C1b			$3^{\underline{2}}$				+1 -1								
C1a			$4^{\underline{2}}$												
Phase 2															
✓ C1c		$1^{\underline{1}}$			$1^{\underline{1}}$	-1	+1								
*C1d		$4^{\underline{1}}$													

TABLE 65 (continued)

CHARMSTONES IN THE WINDMILLER SITES

	SJo-68 Components				SAC-107C	Midden SAC-107C	SAC-168			SJo-56				SJo-142B	SJo-112
	1	2	3	4/5			Midden SAC-168	b2	b1	E	D	C	B - No Charmstones		
Phase 1															
*C2c	$3^{\underline{1}}$		$2^{\underline{1}}$												
C2b	$19^{\underline{2}}$(3)	$3^{\underline{1}}$	$3^{\underline{1}}$			+1									
C2a	$4^{\underline{2}}$	$1^{\underline{1}}$													
C3a	$2^{\underline{2}}$	$1^{\underline{1}}$			1^{1}	+1									
*C3b	$9^{\underline{2}}$														
C3c ✓	$1^{\underline{1}}$				2^{2}										
#C4a1	$1^{\underline{1}}$														
#A5 ✓	$1^{\underline{1}}$														

[1]SJo-56 phases were established by using the arrangement of burials by depth in Heizer's (1949) Table C and noting changes in points and Charmstones through the sequence: burial numbers 15, 9, 32, 8, 66, 43, 25, 63 in Phase E; burial numbers 44, 14, 45, 53, 12, 53, 45, 14, 44 in Phase D; burial numbers 19, 61, 1, 22, 51, 52, 31, 41, 54, 65, 21, 29 in Phase C; and burial numbers 7, 10, 18, 57, 2, 23, 40, 47, 49, 26, 27, 62, 5, 6, 20, 48 in Phase B. Phase A consists of two intrusive Consumnes Culture burials.

[2]The placement of the A Charmstones in time requires the depths of burials with particular types of charmstones in SAC-107C. This breakdown is not available in the literature.

[3]Including 5 fragments, possibly type C2b.

= unique specimen. + = located in midden w/depth and horizontal provenience.

Superscript = number of burials. - = no provenience. * = single site.

TABLE 66

ABSOLUTE DATES ON BONE AND CHARCOAL FROM THE WINDMILLER CULTURE

Windmiller Component	Ind. Site Phase	Windmiller Phase	Burial Catalog Number	Burial Number	Char-coal	Bone	B.P.	B.C.	Laboratory Sample No.	Sample Submitted	Published References
SJo-56	D	3	12-7016	53		X	2855±115	905	I-2751	1967	Heizer 1949:pl 3
SJo-142		5?	12-5679	18		X	2495±120	545	I-2750a	1967	
SJo-142		5?	12-5676	15		X	2585±100	635	I-2750b	1967	
SJo-142		5?	12-5677	16		X	3445±110	1495	GX-0660	1966	
SJo-68	4/5	4	12-7570	22		X	2980±110	1030	I-3038*	1967	
Sac-107C		?	12-5616	22		X	3075±105	1125	I-2748	1967	
Sac-107C		?	12-5588	8		X	2675±135	725	6X-0659	1966	
Sac-168	B	3?	12-9556	17		X	3070±170	1120	I-3037*	1967	
SJo-68	1	1	12-7571	24		X	3585±110	1635	I-2749a	1967	
SJo-68	1	1	12-7572	23		X	3775±160	1825	I-2749b*	1967	
SJo-68	?	Screened		---	X		4052±160	2102	C-440/522	1956	Heizer 1958
SJo-68	?	Screened		---	X		4100±250	2150	M-645	1957	Heizer 1958
SJo-68	1?		12-7674	Cremation Number 1		X	3080±300	1130	M-646	1957	Heizer 1958
SJo-68	3-1?		12-7676	Cremation Number 3		X	4350±250	2400	M-647	1957	Heizer 1958

*Using 2N NaOH solution to remove humic acids.

Dating was financed by a Graduate Research Council grant 1965-66 and by The University of California Archaeological Research Facility.

The dating of collagen in bone results in dates approximately 500 years younger than the mixed charcoal sample from SJo-68.

Geochron Laboratory cleaned its samples with HCl and recovered collagen in a cold dilute solution of HCl. They did not use NaOH in the cleaning process.

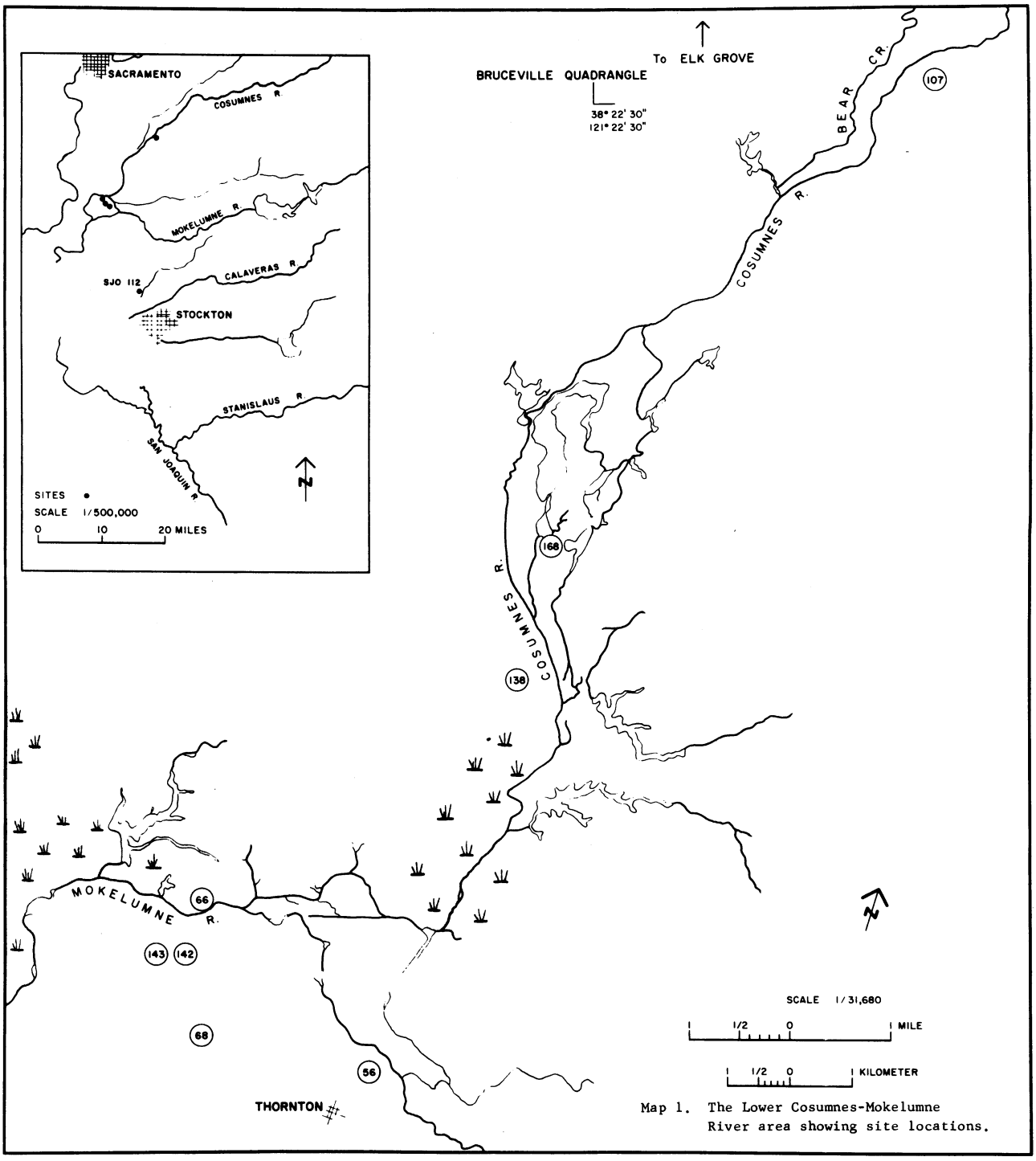
TABLE 67 (continued)

Rabbit Island I								
Burial Number	Surface Depth	Position	Orientation	Deposition	Dimensions	Sex	Age	Associations and Remarks
7-52	3.0	Extended	NE	Supine	L. 2.9, W. 0.8		Inf.	14 clam shell fragments, 7 mussel shell fragments (4 with cut edges), 52 perforated shell disc beads
10-52	2.9	Extended	NE	Prone	L. 5.5, W. 1.3	F	Adult	2 pestles, 1 Rabbit Island stemmed point imbedded in first lumbar vertebra -- red Ocher -- possible fronto-lamboidal skull deformation
12-52	2.8	Extended	NE	Supine	L. 5.3, W. 1.3, Th. x		Adult	None
13-52	3.7	Extended	NE	Supine	L. 2.9, W. 0.9, Th. x		1 yr	1,216 small shell disc beads - perforated

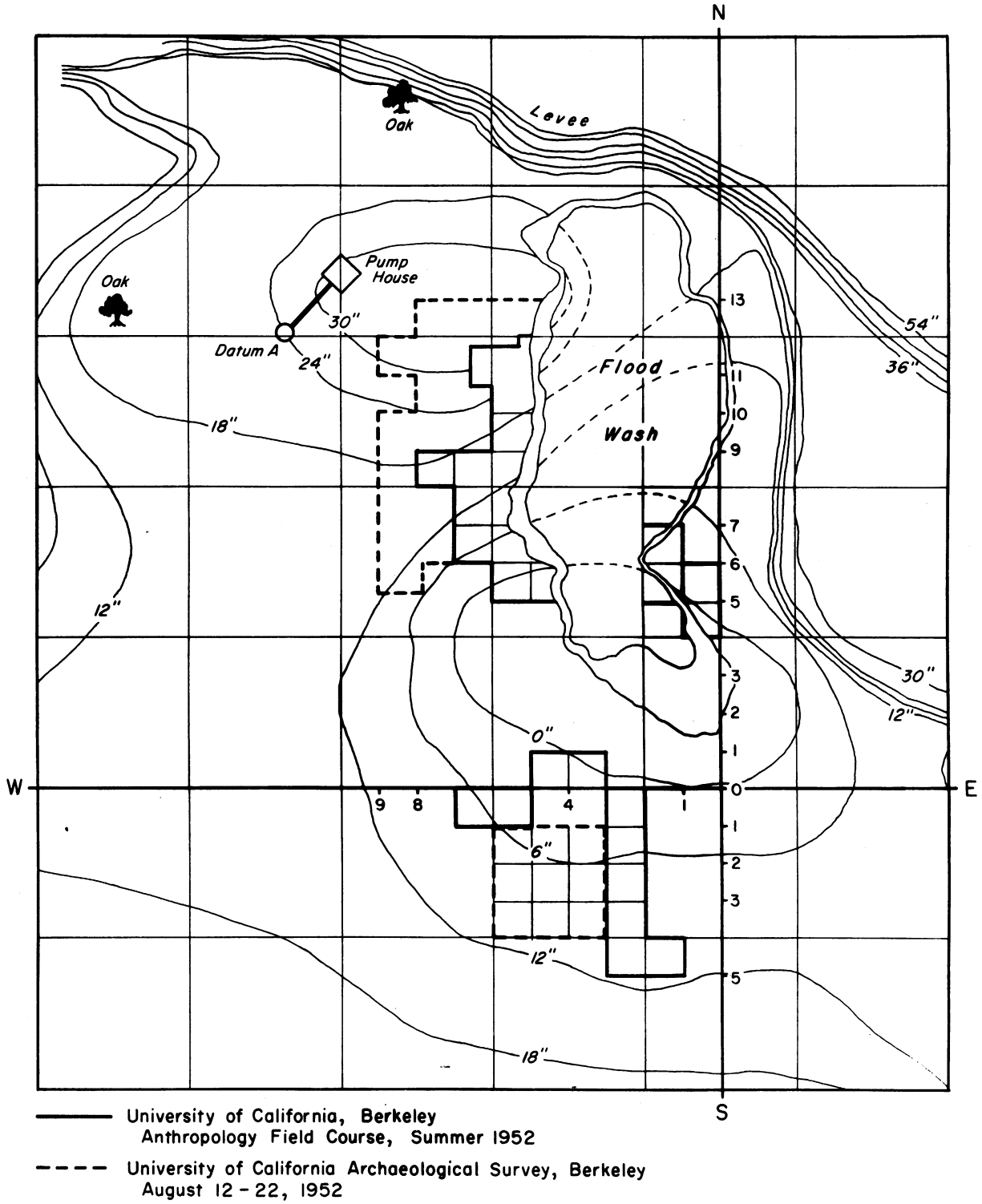
TABLE 67.

Burial Information from Rabbit Island I (From Crabtree, 1957: 13-15, Table 67)

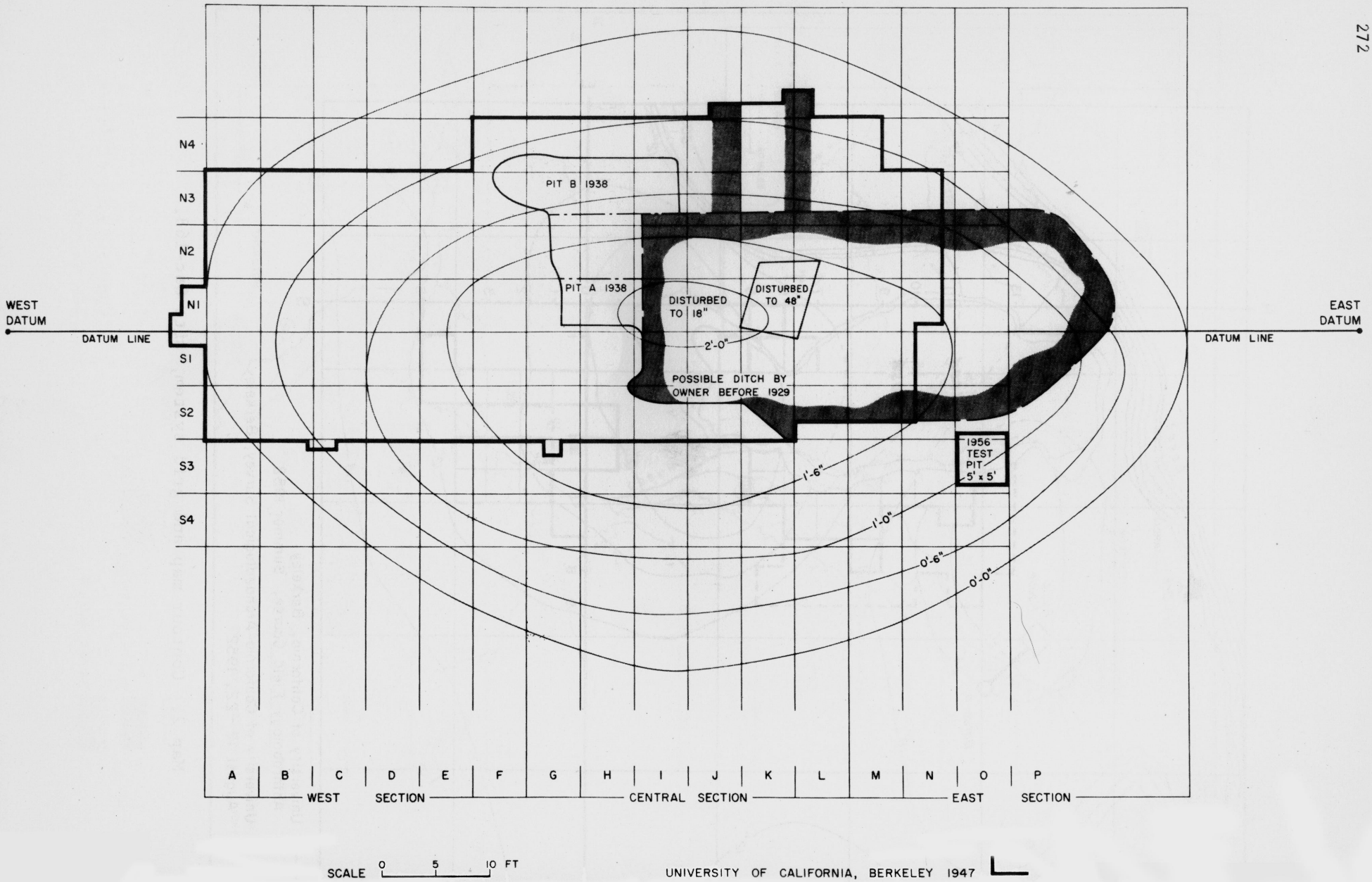
Rabbit Island I								
Burial Number	Surface Depth	Position	Orientation	Deposition	Dimensions	Sex	Age	Associations and Remarks
6-51	1.8	Extended	NE	Supine	L. 5.6, W. 1.4, Th. 0.2	M	MA	3 Rabbit Island stemmed points
8-51	4.0	Extended	NE	Supine	L. 4.0, W. 1.3, Th. x		Child	26 points (12 Rabbit Island stemmed, 13 modified triangular, 1 broken), 1 bone point or awl
9-51	2.8	Extended	NE	Supine	L. 5.8, W. 1.7, Th. x	M	MA	12 unworked flakes, 1 pebble, 2 flake blades, 2 Rabbit Island stemmed points, 1 small point or drill, 1 chopper, 1 rectangular slate object, 3 antler wedges, 3 antler fragments
10-51	3.0	Extended	NE	Supine	L. 5.4, W. 1.1, Th. x		13-17	1 pestle, 1 Rabbit Island stemmed point --- common burial with B11-51
11-51	3.0	Extended	NE	Supine	L. 5.9, W. 1.3, Th. x	F	Adult	8 points (6 Rabbit Island stemmed, 1 square based round shoulders, 1 broken), 34 shell disc beads, 1 bone comb
4-52	3.6	Extended	NNE	Supine	L. 5.8, W. 1.6	M	Adult	27 shell disc bead fragments (11 with perforation), red ocher, 9 cobbles covering the skull
6-52	3.0	Extended	NE	Supine	L. 5.4, W. 1.1	M	Adult	1 perforated shell disc bead, 1 fragment of clam shell, common burial with B7-52



Map 1. The Lower Cosumnes-Mokelumne River area showing site locations.



Map 2. Contour map and grid system, site Sac-168.



Map 3. Contour map, grid plan and excavated areas, site SJo-68.

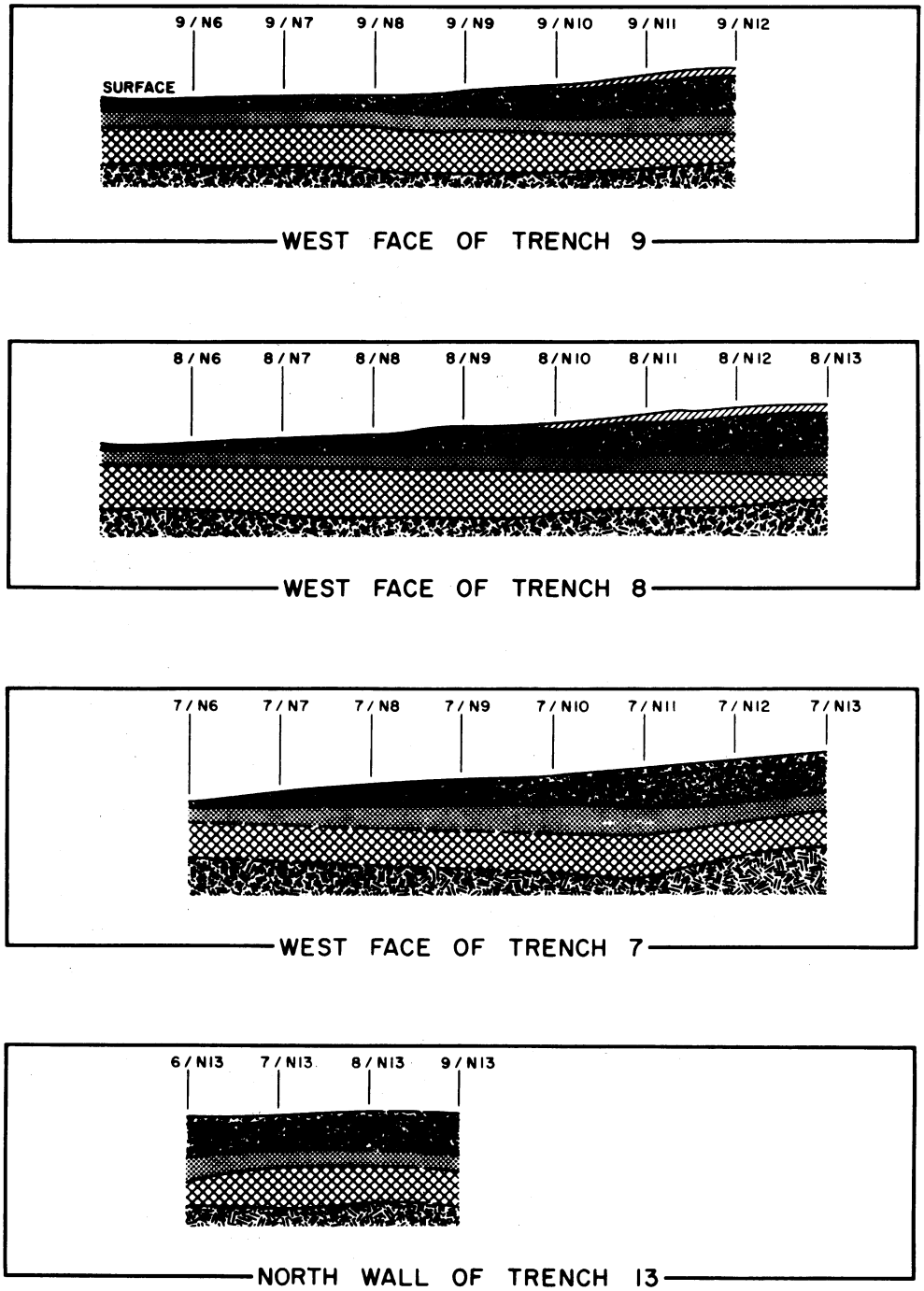


Fig. 1 Stratigraphic profiles, site Sac-168.

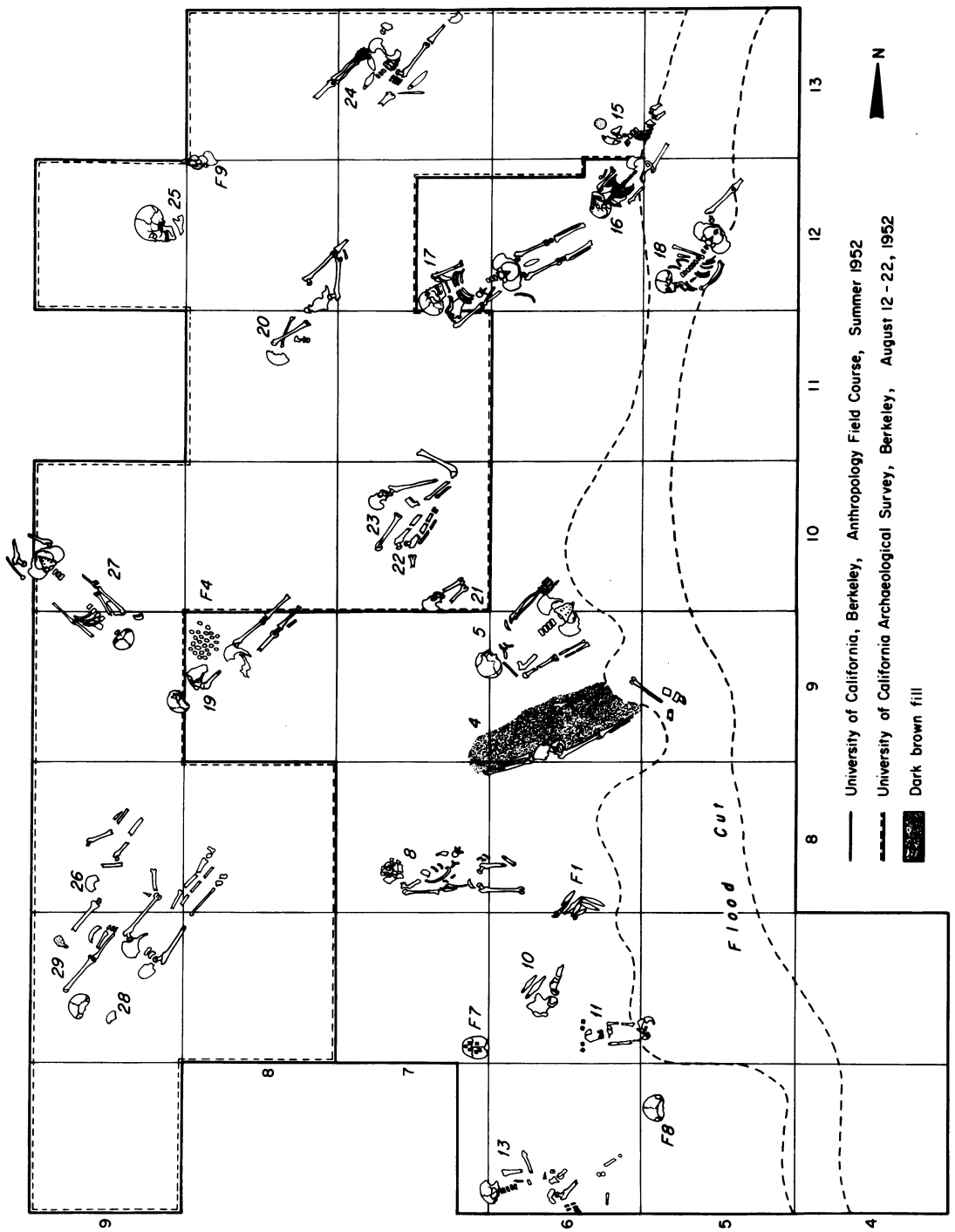


Fig. 2. Plan of hardpan and brown midden north, site Sac-168B.

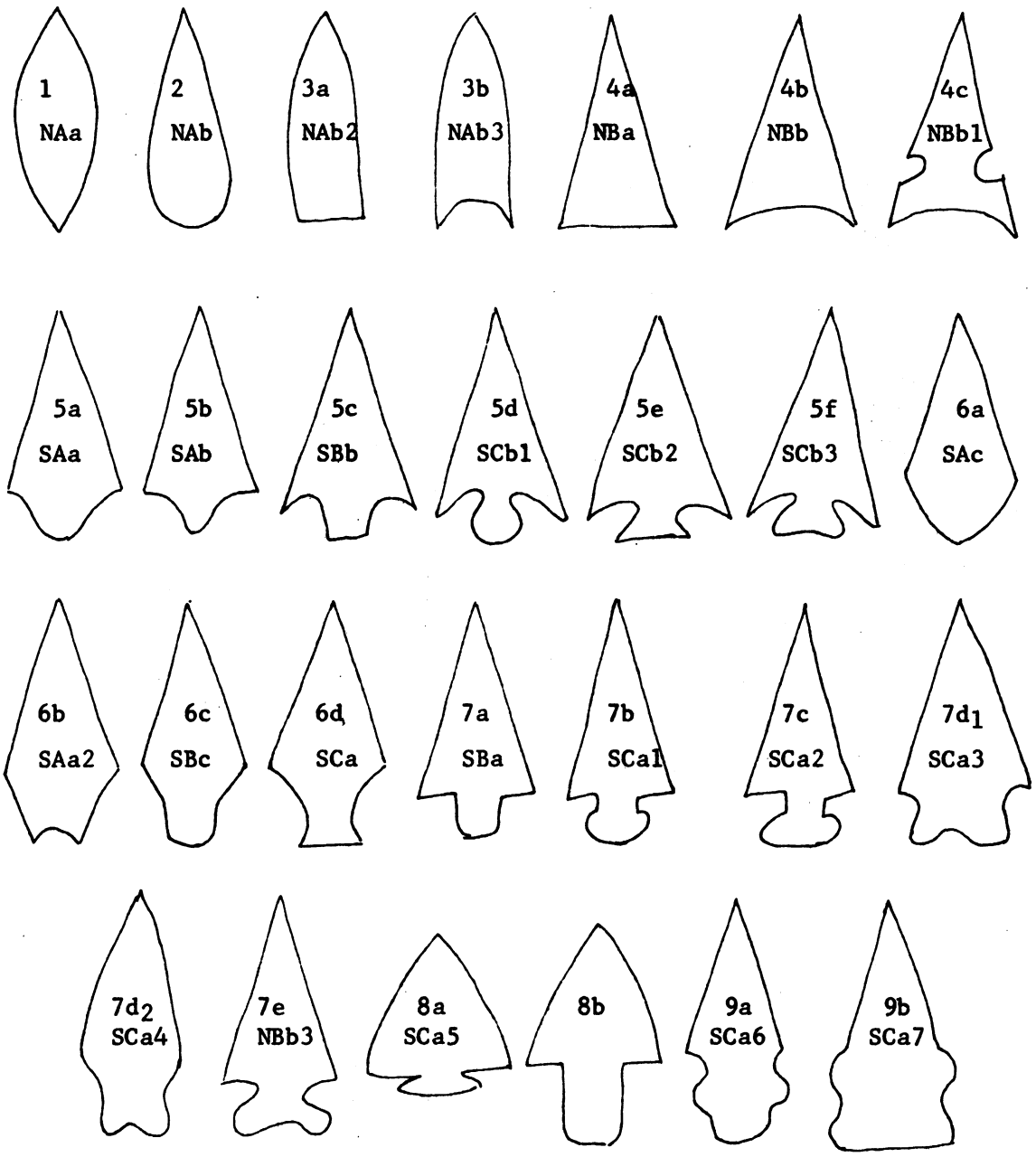


Fig. 3. Windmiller Culture Projectile Point Typology

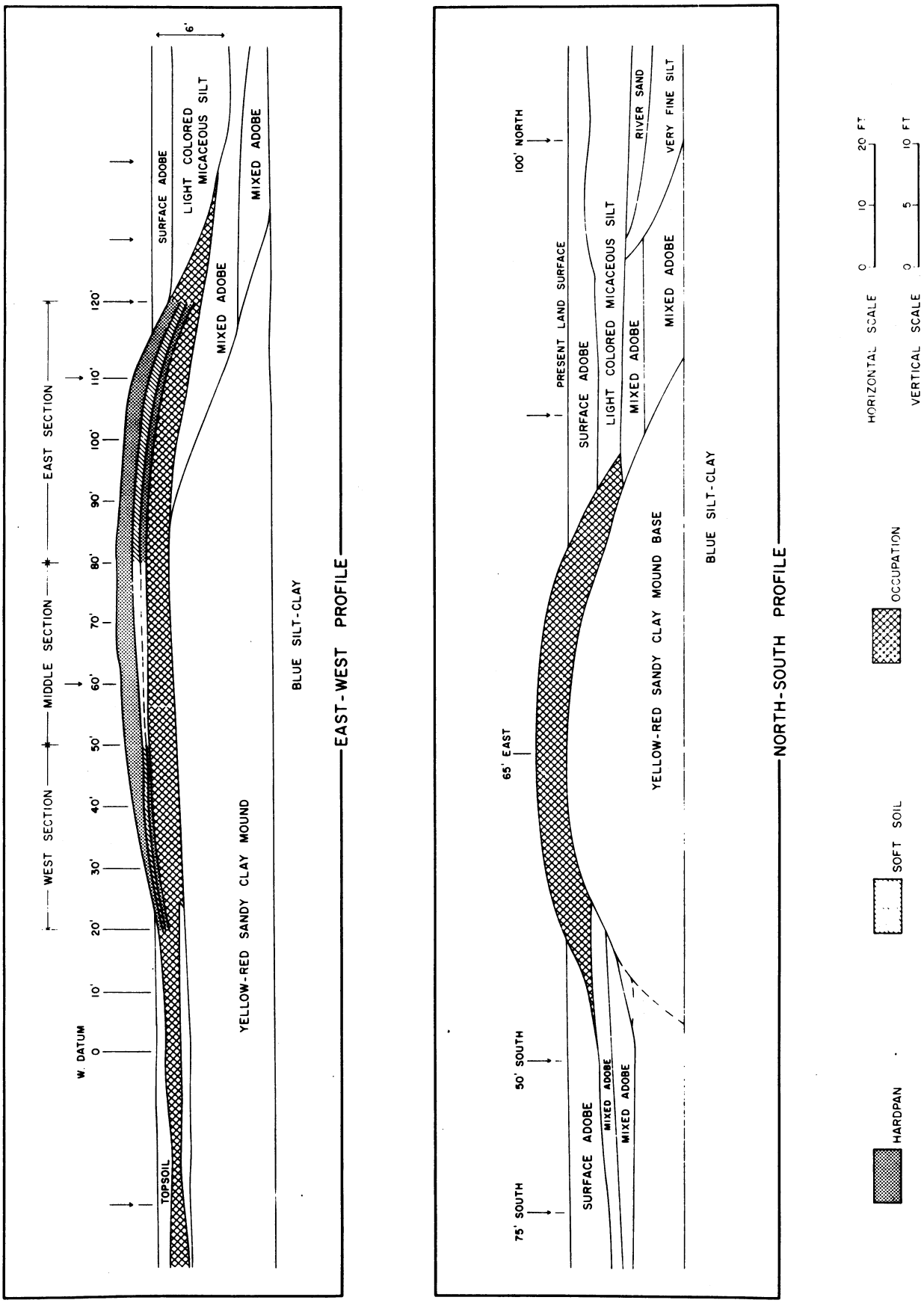


Fig. 4. North-south and east-west profiles of site SJo-68.

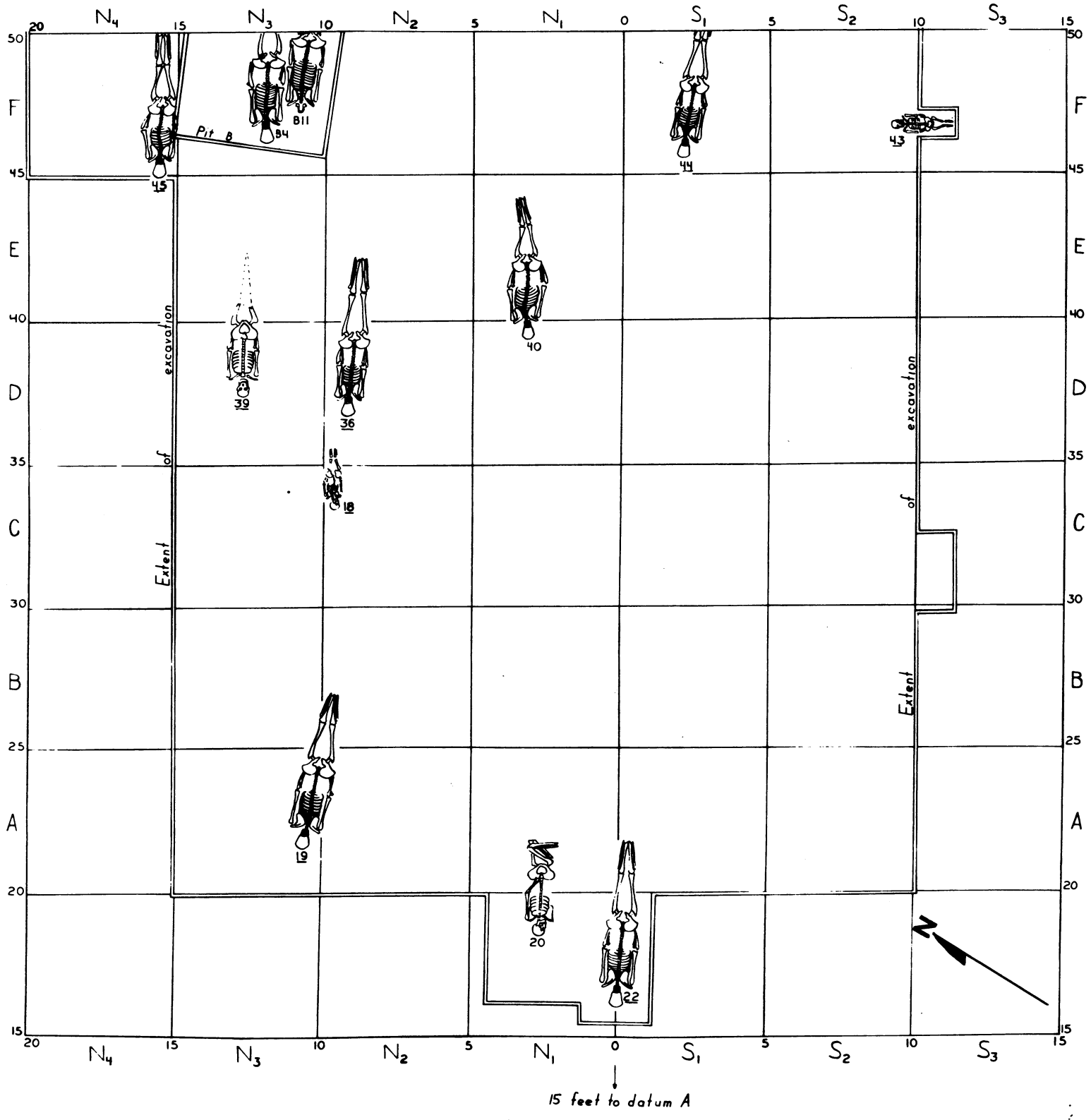


Fig. 5. Burial plan, SJo-68; Trenches A-F, at a depth of 0-24".

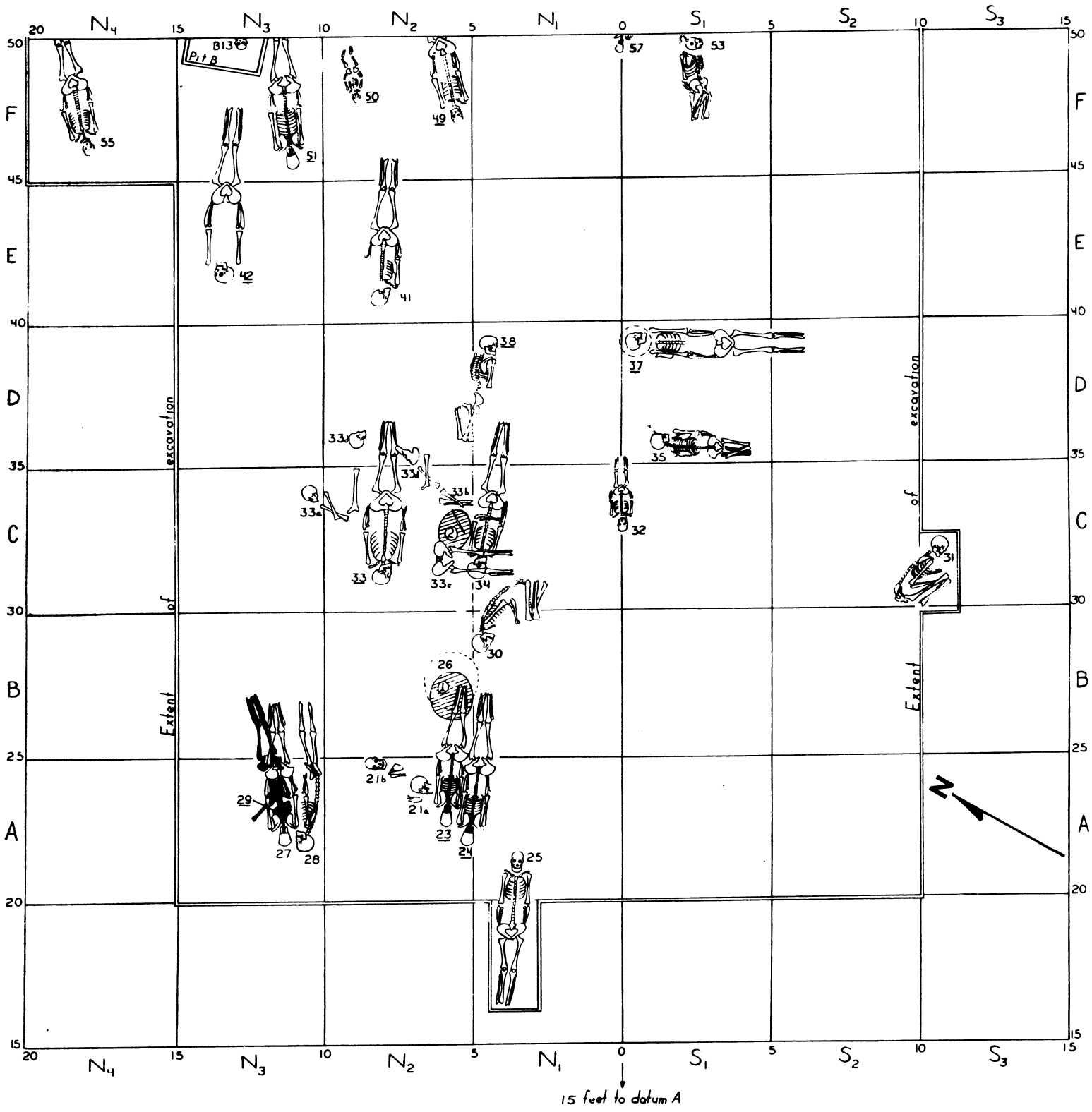


Fig. 6. Burial plan, SJo-68; Trenches A-F, at a depth of 24-60". Cremations indicated by hachured lines. Disturbed burials indicated by dashed lines.

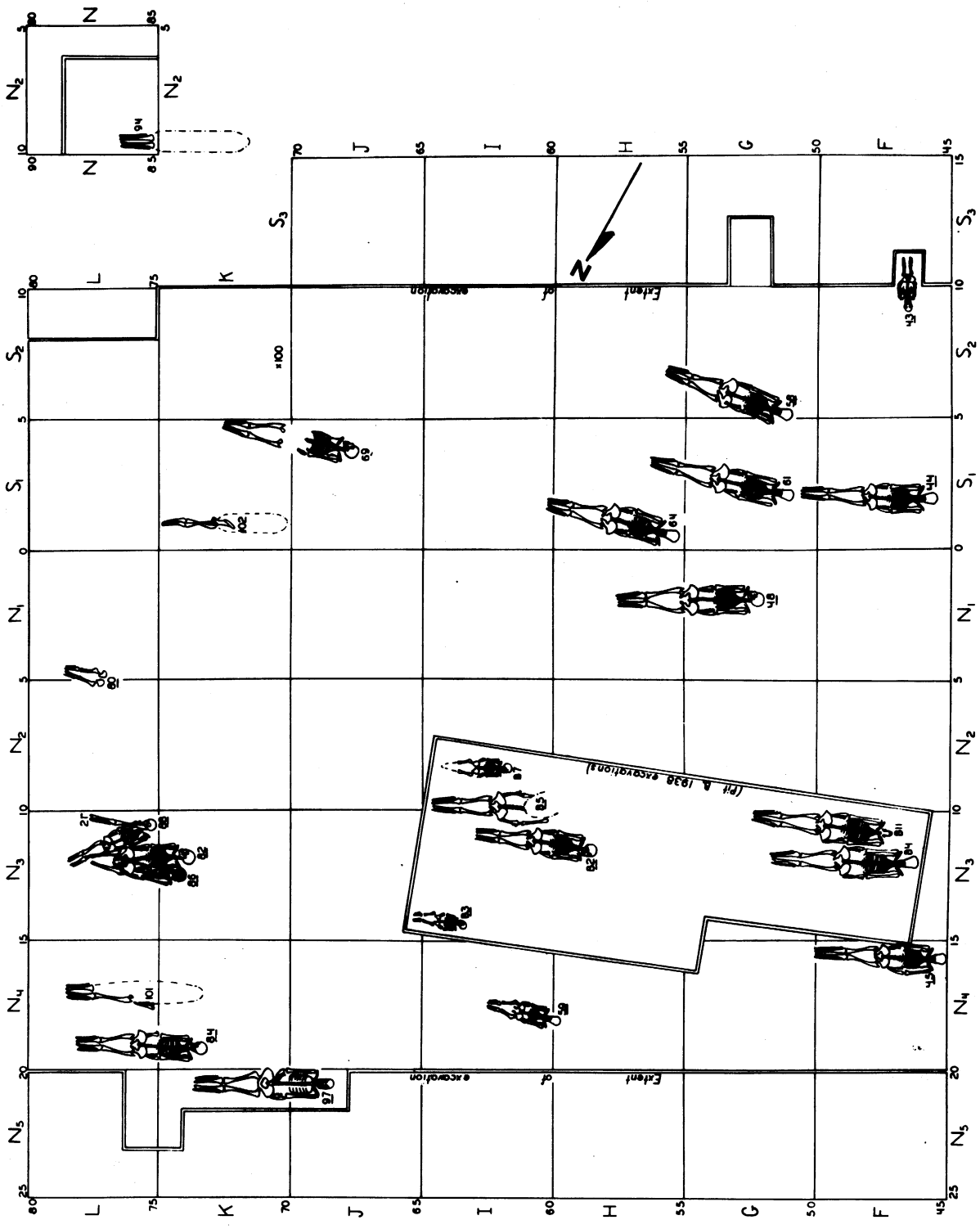


Fig. 7. Burial plan, SJo-68. Trenches F-N, at a depth of 0-24".

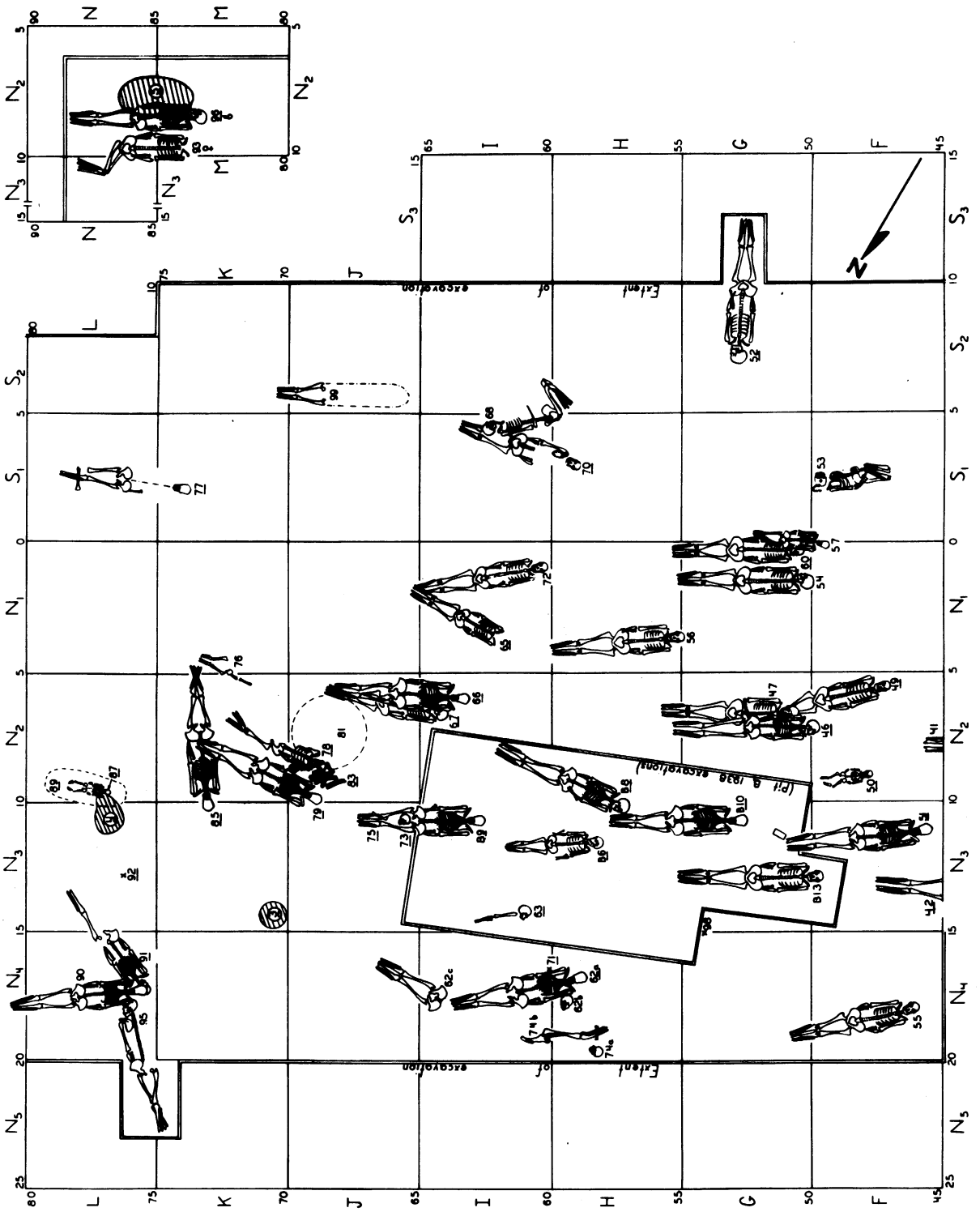


Fig. 8. Burial plan, SJo-68; Trenches F-N, at a depth of 24-60". Cremations indicated by hachured lines; disturbed burials, by dashed lines.

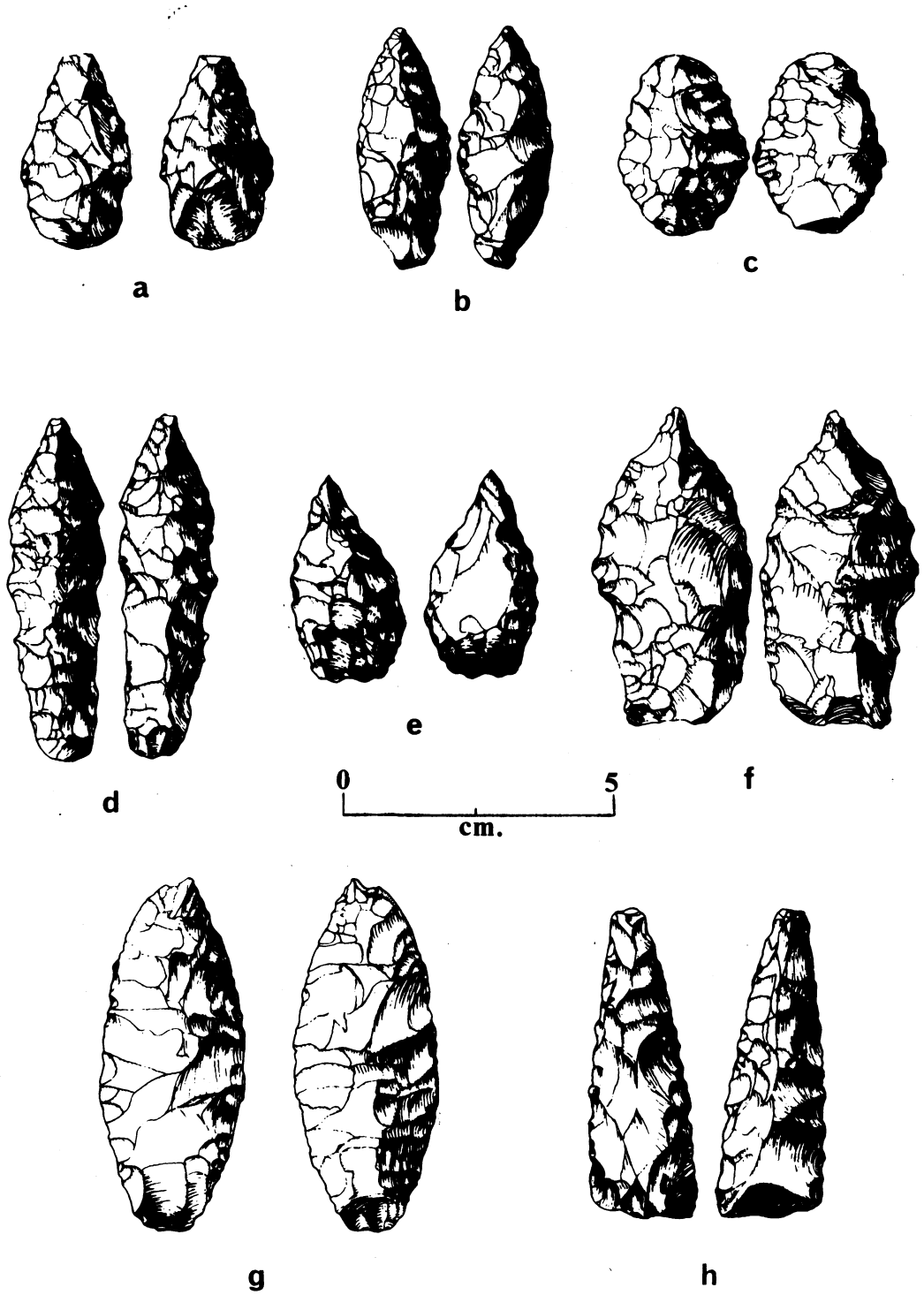
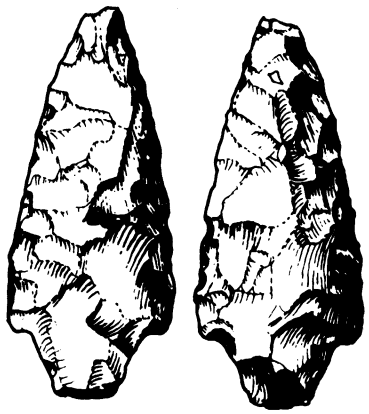
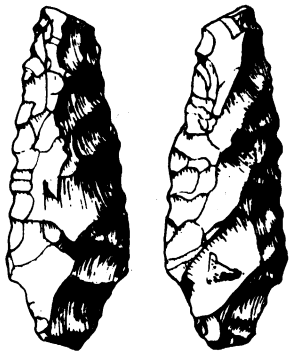


Fig. 9. Projectile Points, site Sac-168.

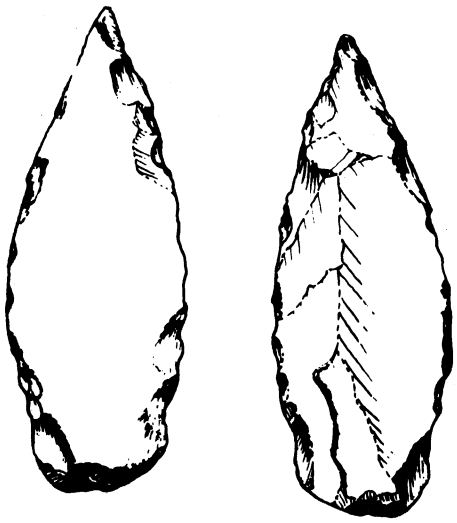
a. 1-133978 slate type 5a, no location.
b. 1-134013 obsidian type 1, no location.
c. 1-134025 obsidian type 3a, no location.
d. 1-134009 obsidian Hotchkiss Culture knife (?), square 3-S2, 10"d.
e. 1-134010 obsidian type 3a, square 6-N8, -29"d.
f. 1-134016 obsidian type 8b (?shouldered knife), square 6-N11, 13"d.
g. 1-165100 quartz crystal, type 3a, square 8-N12, -23"d.
h. 1-165099 slate point fragment, square 7-N12, surface.



a

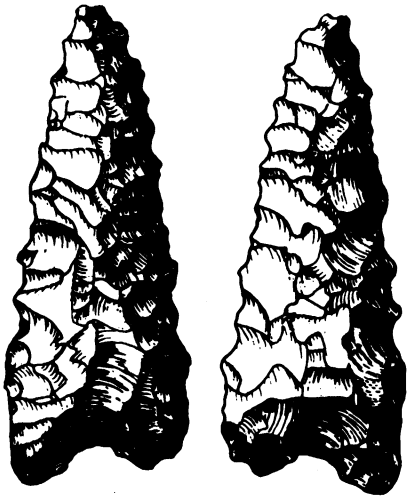


b



c

d



e

Fig. 10. Projectile Points, site Sac-168
(Illustrated actual size)

a. 1-133981 slate type 5a,
square 7-N7, -36"d.

b. 1-133971 obsidian type 7c,
square 3-S6, -6"d.

c. 1-133973 slate type 7a,
no location.

d. 1-165102 slate type 3a,
square 9-N8, -9"d.

e. 1-165093 obsidian type 3b,
square 9-N7, -33"d.

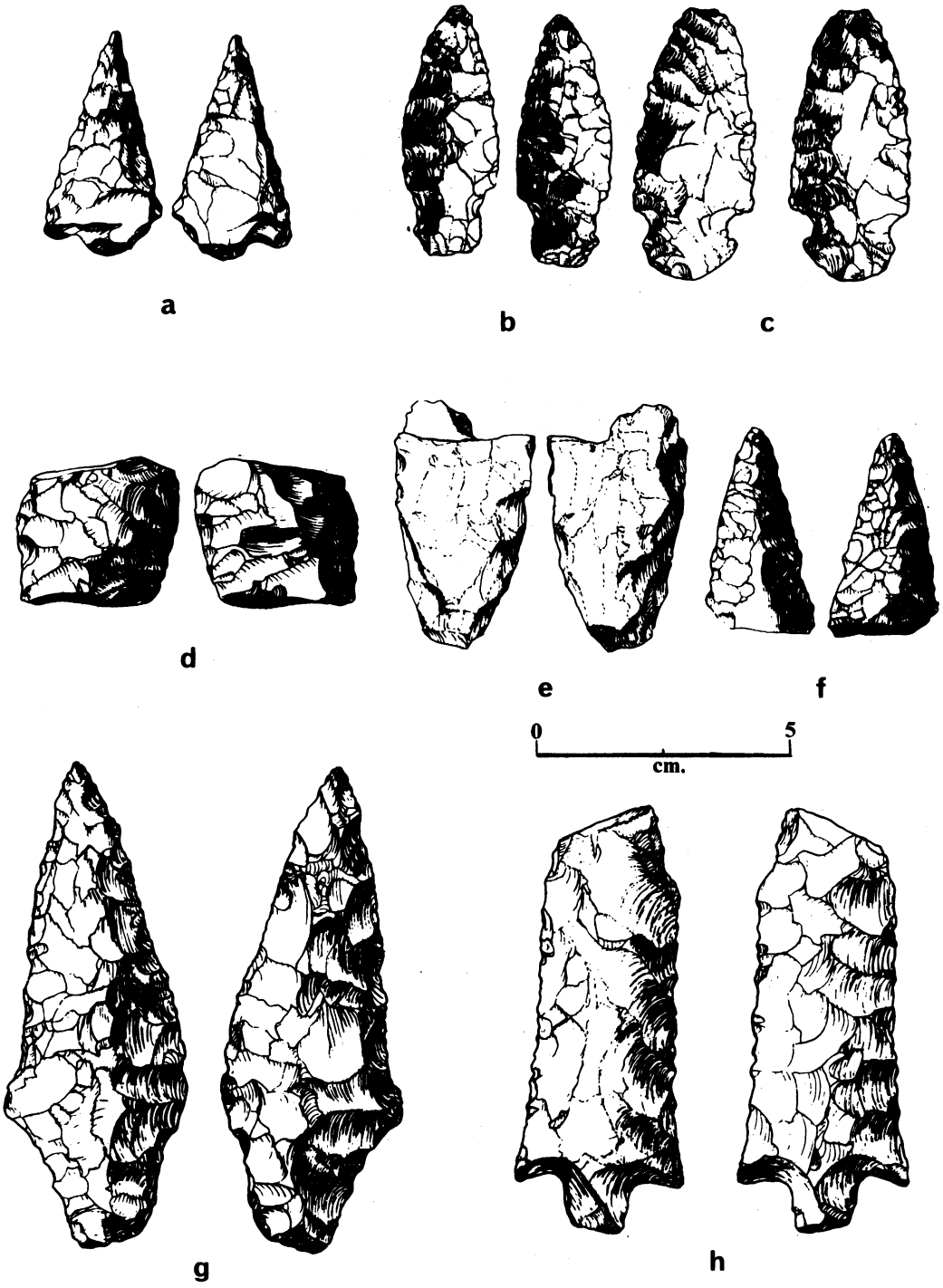


Fig. 11. Projectile Points, site Sac-168

a. 1-165098 slate type 5a, square 6-N13, surface, b. 1-133994 quartz type 7a, no location, c. 1-133983 obsidian type 7b, square 5-S1, -10"d., d. 1-165094 obsidian fragment, square 9-N10, -25"d., e. 1-165101 slate type 2, no location, f. 1-134008 obsidian fragment, square 3-S2, 6"d., g. 1-133988 chert type 5a, no location, h. 1-133974 slate type 7a, square 7-N8, -35"d.

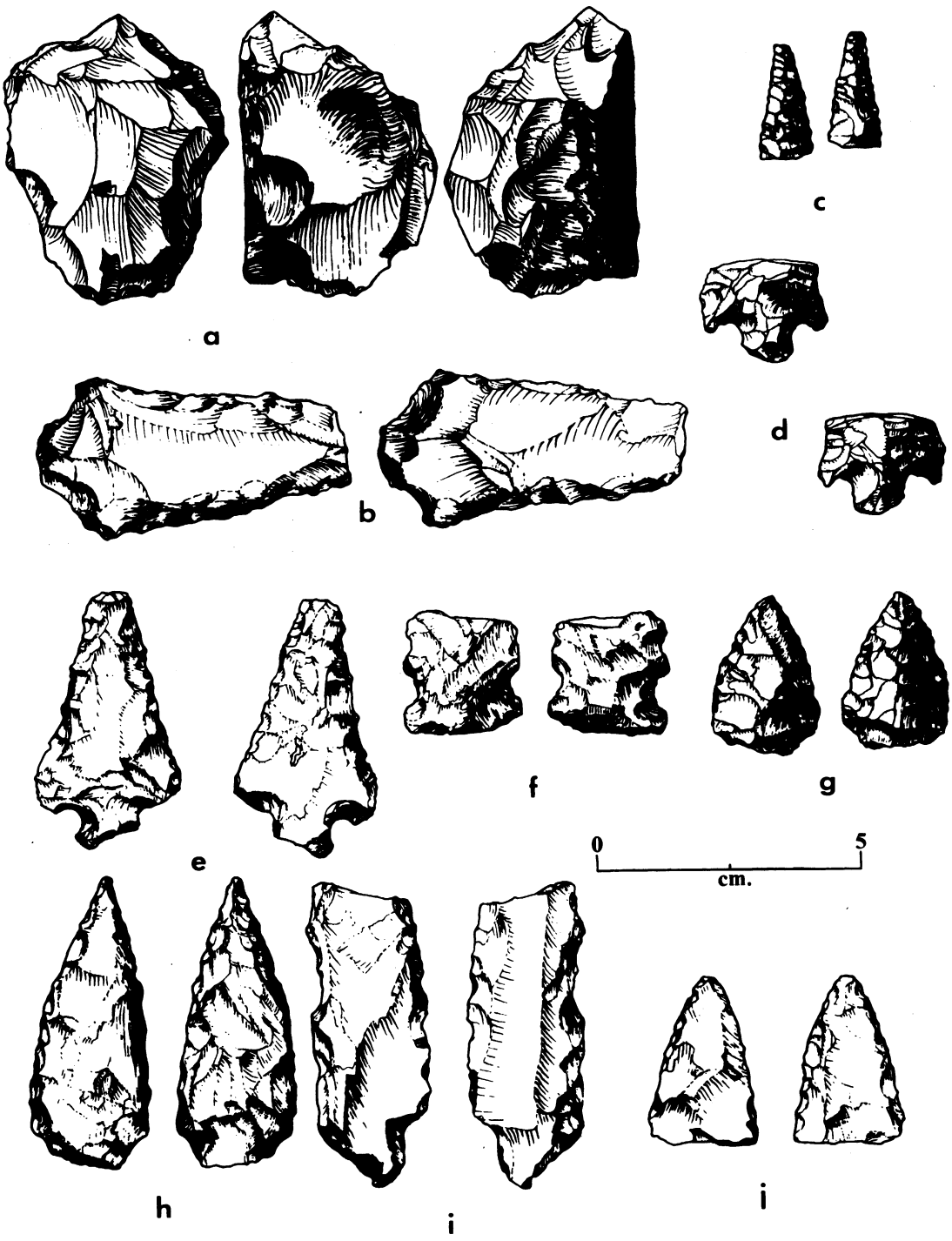


Fig. 12. Chipped Stone Artifacts, site Sac-168

a. 1-133948 chert core scraper (top and side view), no location. b. 1-133980 slate type 5a, no location, c. 1-133982 yellow chert fragment, no location, d. 1-133983 obsidian type 5a, square 5-S1, -10"d., e. 1-133972 slate type 7d, square 1-S4, surface, f. 1-133971 slate type 5a, square 3-S6, 6"d., g. 1-133984 chert type 1, square 7-N8, -23"d., h. 1-133975 slate fragment, no location, i. 1-133976 slate knife fragment, burial No. 7, j. 1-133977 obsidian fragment, square 6-N12, +22"d.

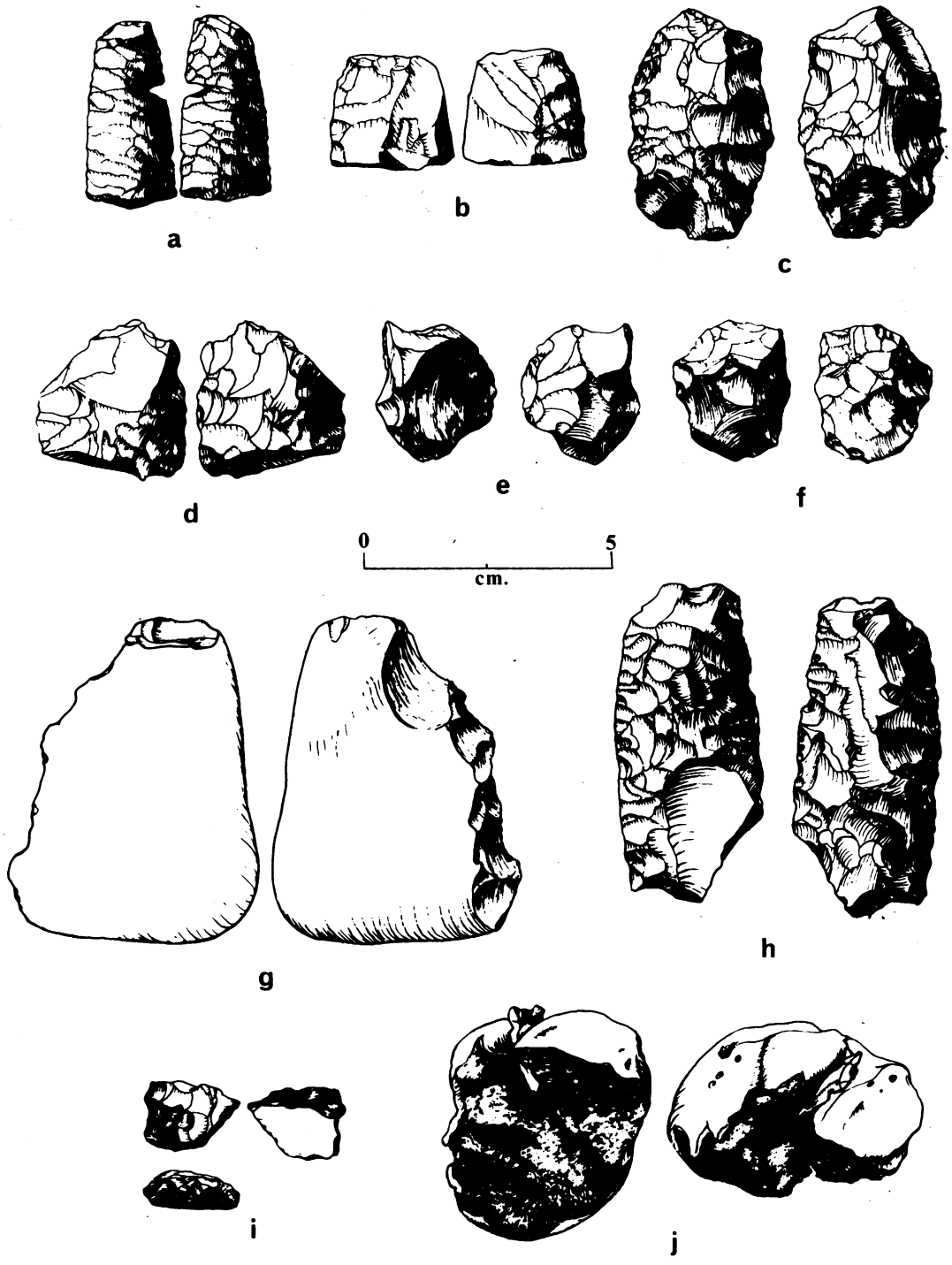


Fig. 13. Chipped Stone Artifacts, site Sac-168

a. 1-134011 obsidian fragment, square 4-S2, -9"d., b. 1-165097 obsidian fragment, square 7-N13, -12"d., c. 1-165095 obsidian fragment, square 7-N10, -45"d., d. 1-165107 obsidian fragment, no location, e. 1-165106 obsidian fragment, no location, f. 1-165105 obsidian scraper, no location, g. 1-165112 chert pebble scraper, square 7-N10, -63"d., h. 1-165096 obsidian fragment, square 9-N9, -42"d., i. 1-165108 obsidian, thumbnail scraper, no location, j. 1-133950 obsidian type C1a point embedded in left humerus, surface.

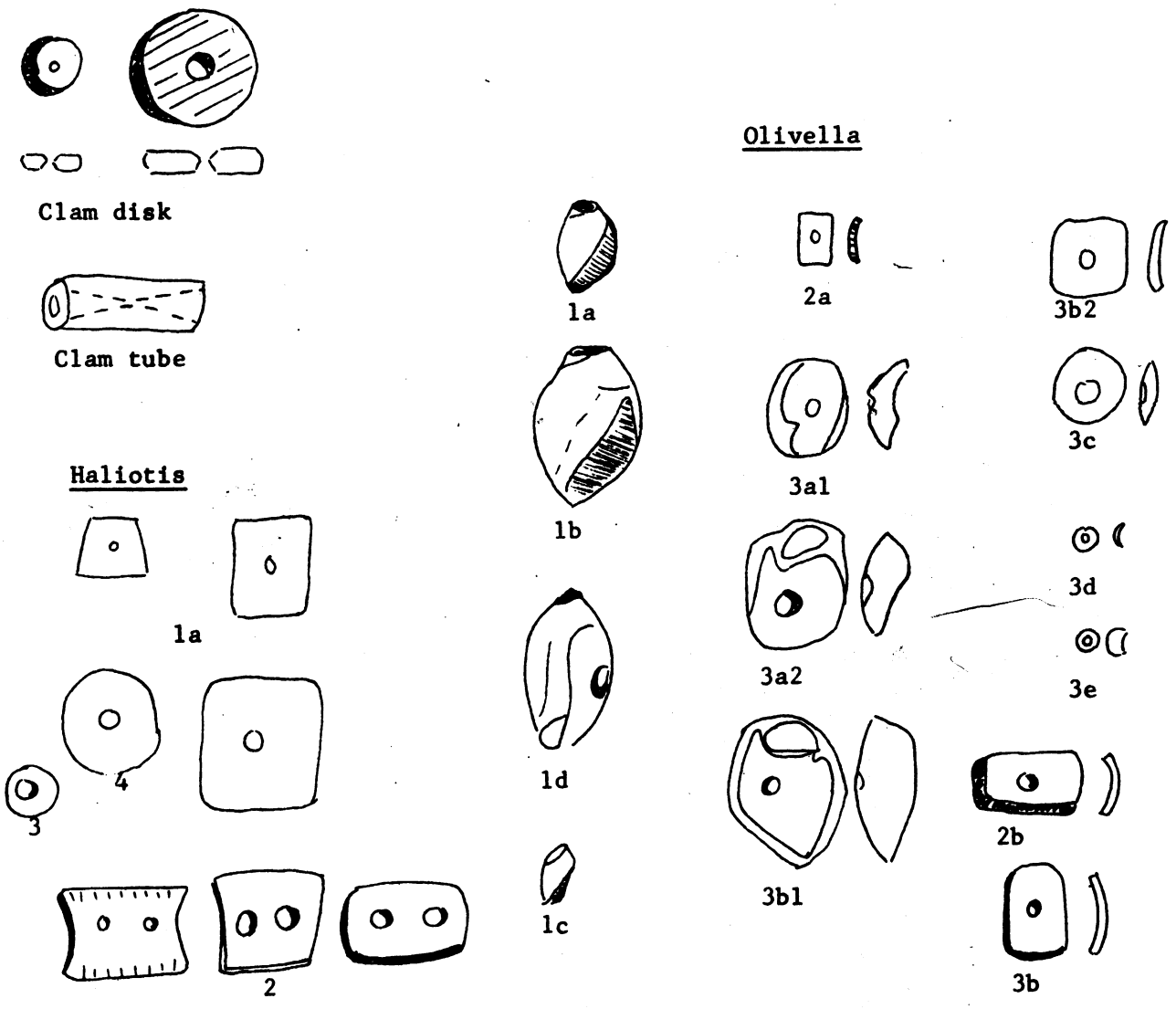
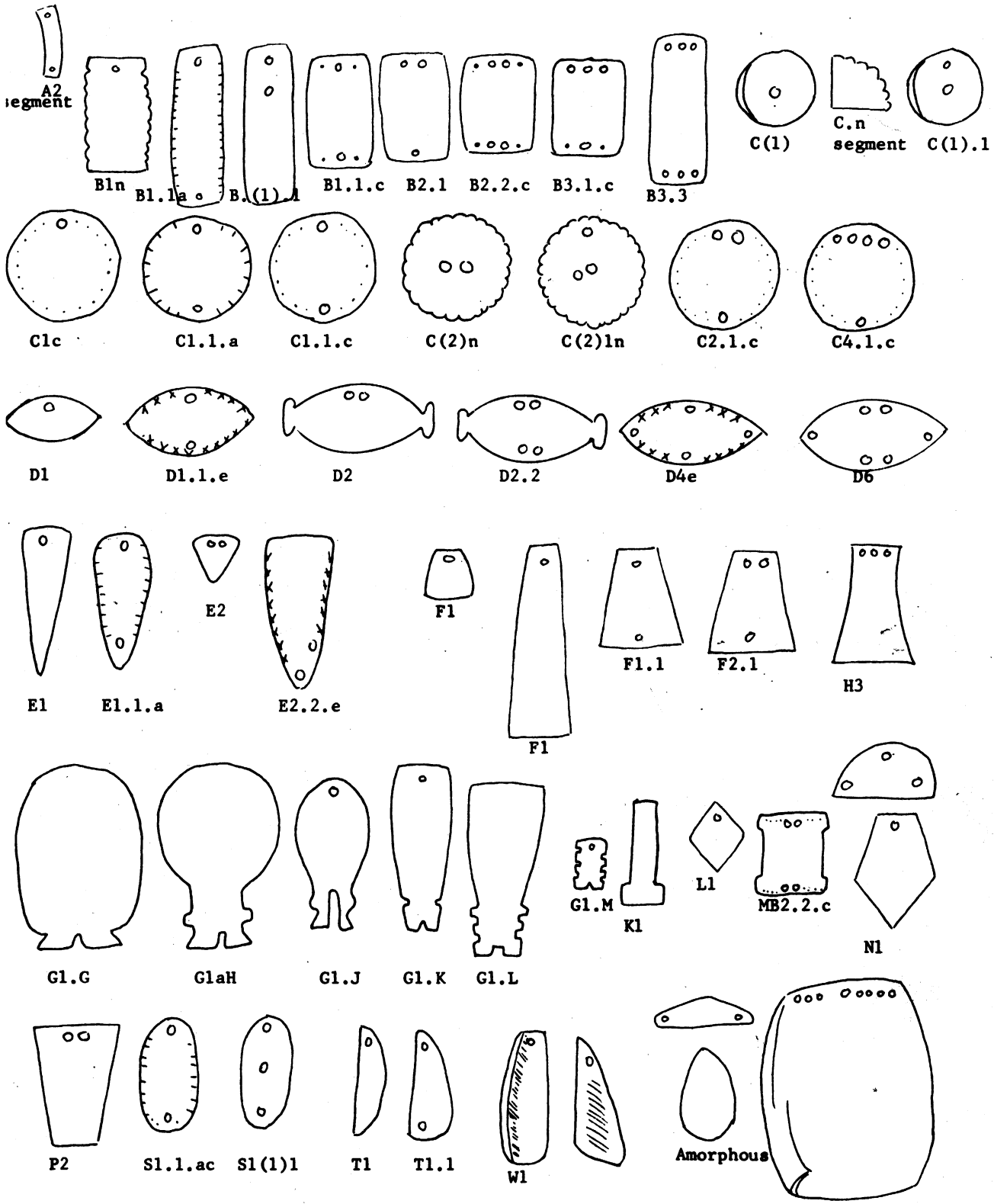


Fig. 14. Shell Bead Typology



Decoration: a = edge incising; c = edge puctation; e = edge v-incising
n = edge nicking.

Fig. 15. Haliotis Ornament Typology.

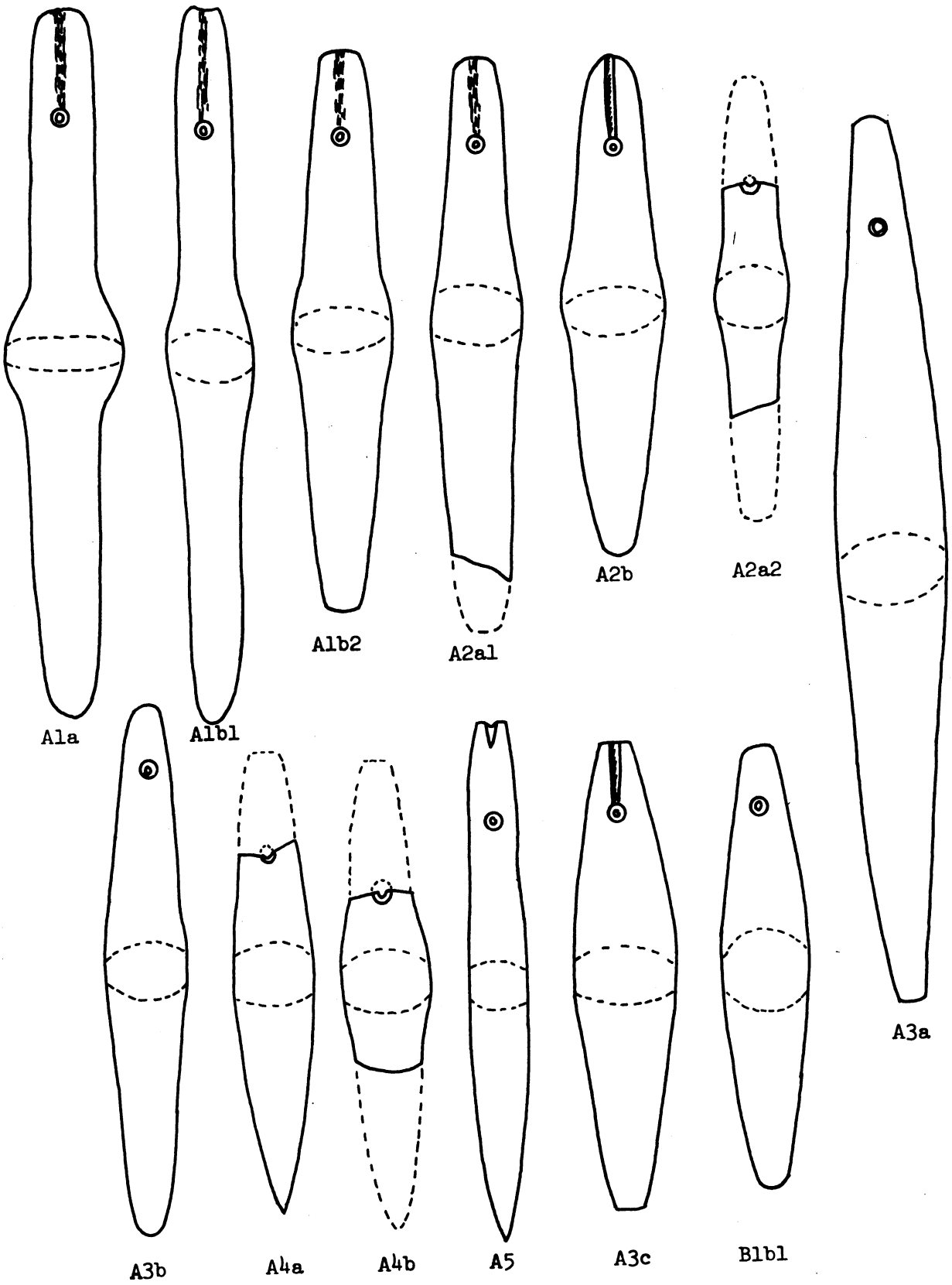


Fig. 16. Charmstone Typology.

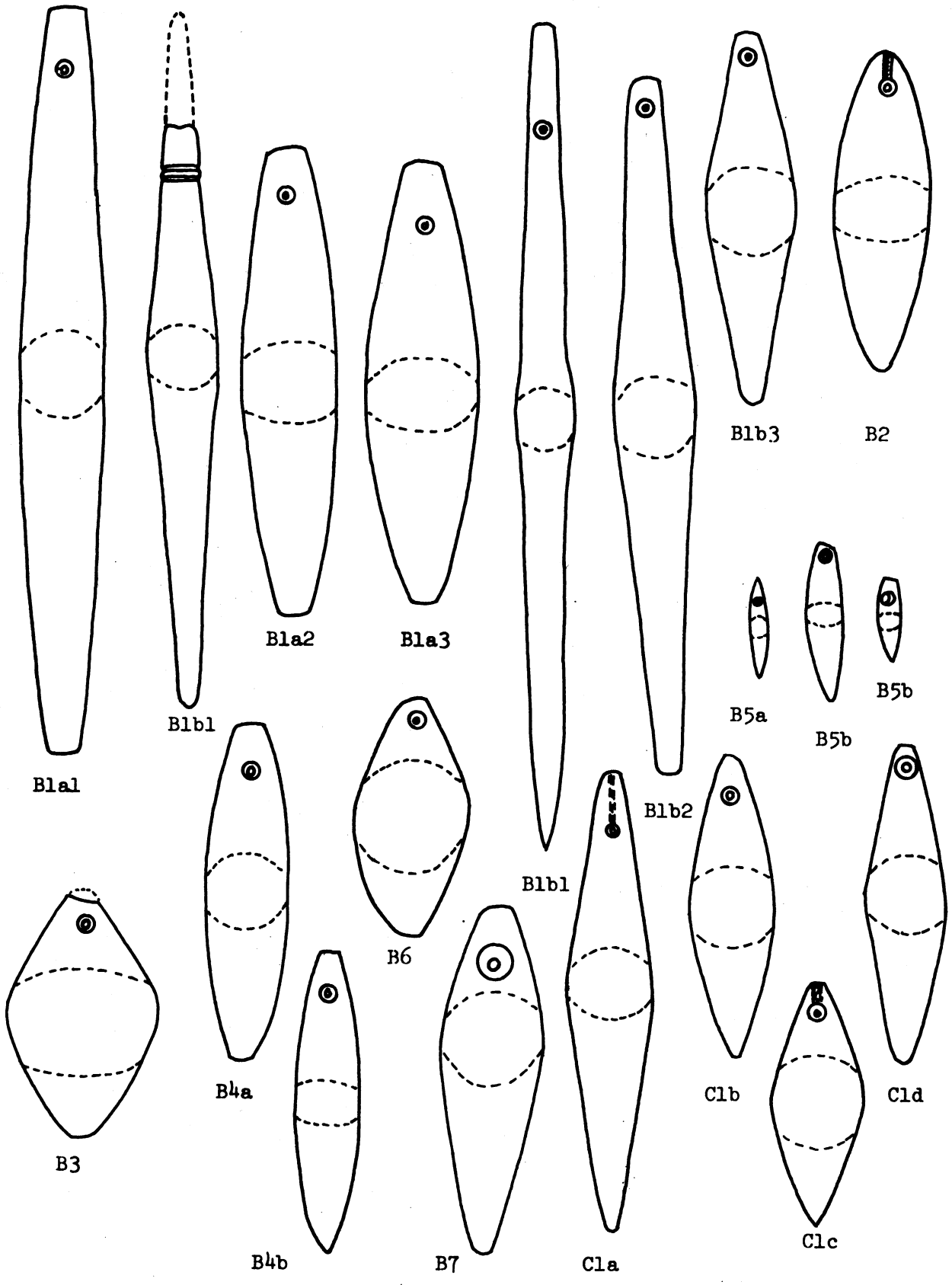


Fig. 17. Charmstone Typology (cont.)

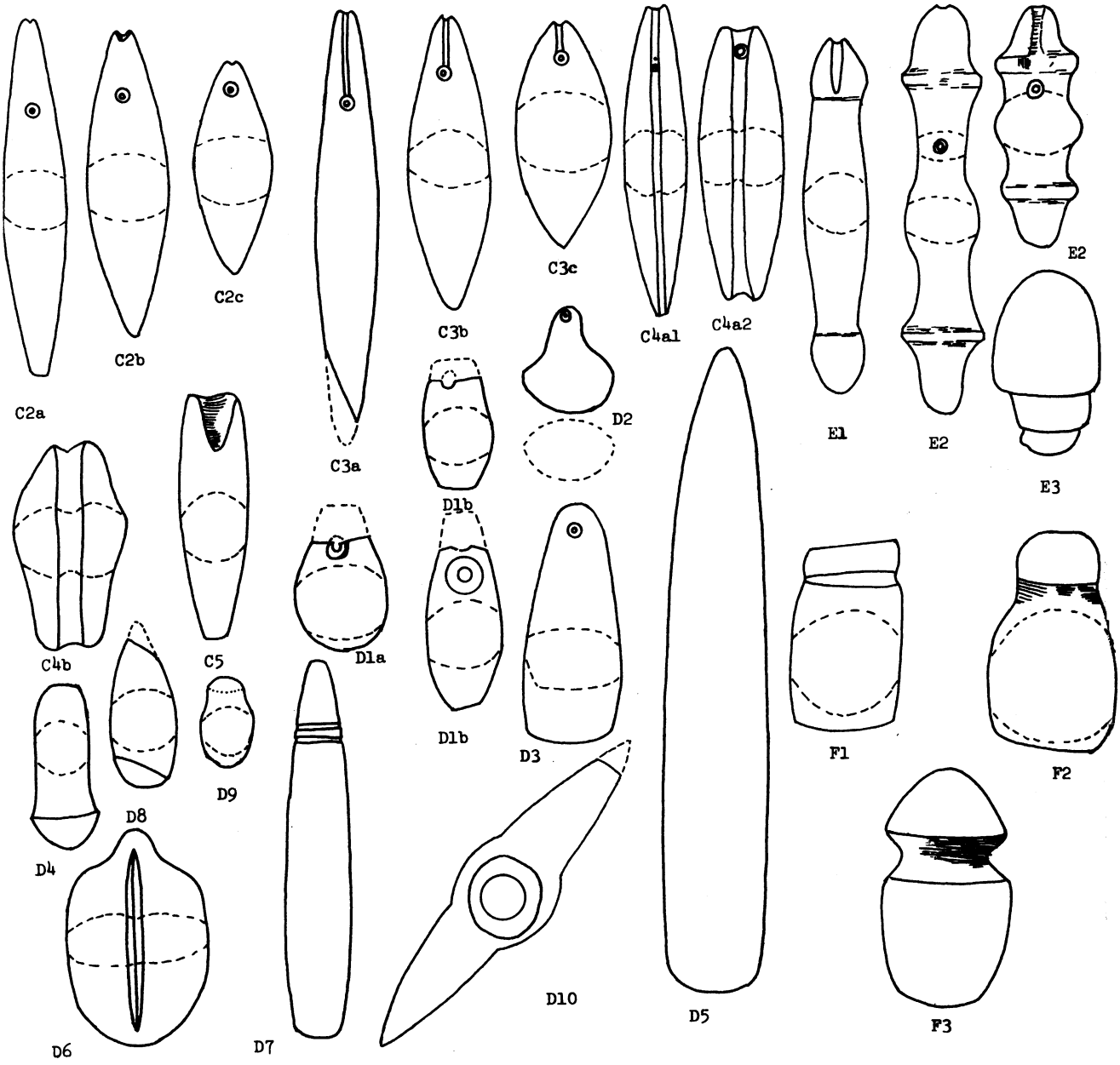


Fig. 18. Charmstone Typology (cont.)

Charmstones, sites Sac-168, SJo-68

(Not to scale)

Plate 1

a. 1-33724 (A1b1)

b. 1-33927 (A2a1)

c. 1-33919 (A3a)

d. 1-33925 (A3b)

e. 1-73408 (A5)

f. 1-73452 (B1a3)

g. 1-33923 (B1b2)

h. 1-33930 (B1b2)

i. 1-33929 (B1b2)

j. 1-33942 (C1b)

Plate 1.

Charmstones, sites Sac-168, SJo-68

(Not to scale)

Plate 2

a. 1-55326 (B1b3)

b. 1-33945 (B4a)

c. 1-49063 (B4b)

d. 1-73464 (C1a)

e. 1-73458 (C1a)

f. 1-73432 (C2a)

g. 1-73430 (C2a)

h. 1-73431 (C3a)

i. 1-73402 (C2b)

j. 1-73459 (C2b)

k. 1-73404 (C3b)

l. 1-73460 (C2b)

m. 1-33932 (E2)

n. 1-73457 (E2c)

o. 1-33937 (E2)

Plate 2.

Obsidian projectile points, site SJo-68

Plate 3

a. 1-55275 Type 1, Dawson grave lot 15, d. 15 in., l. 6.0 cm.

b. 1-73377 Type 1, Burial 80, d. 18 in., l. 6.0 cm.

c. 1-73376 Type 1, Burial 80, d. 18 in., l. 7.0 cm.

d. 1-73189 Type 1, Square A/S1, d. 21 in., l. 6.0 cm.

e. 1-73328 Type 1, Square I/N1, d. 30 in., l. 8.5 cm.

f. 1-73298 Type 1, Burial 42, d. 33 in., l. 8.0 cm.

g. 1-73269 Type 2, Square D/S2, d. 40 in., l. 9.0 cm.

h. 1-55281 Type 2, Dawson grave lot 17, d. 20 in., l. 5.0 cm.

i. 1-86437 Type 2, d. 42 in., l. 4.5 cm.

j. 1-55290 Type 3a, Dawson grave lot 28, d. 14 in., l. 5.5 cm.

k. 1-55260 Type 3a, Dawson grave lot 62, d. 12 in., l. 4.0 cm.

l. 1-55235 Type 5c, no location, l. 9.0 cm.

m. 1-55294 Type 3b, Dawson grave lot 5, d. 6 in., l. 4.5 cm.

n. 1-55273 Type 3b (?), Dawson grave lot 14, l. 5.0 cm.

o. 1-55288 Type 3b, Dawson grave lot 26, d. 36 in., l. 5.5 cm.

p. 1-73230 Type 3b, Burial 23, d. 47 in., l. 5.5 cm.

q. 1-73292 Type 3b, Square F/N1, d. 20 in.

r. 1-73245 Type 3b, Burial 24, d. 47 in., l. 5.5 cm.

s. 1-86448a. Type 3b, Burial 105, d. 33 in., l. 5.0 cm.

t. 1-86448c. Type 3b, Burial 105, d. 33 in., l. 6.5 cm.

u. 1-86448d. Type 3b, Burial 105, d. 33 in., l. 5.5 cm.

v. 1-73380 Type 3b, Burial 78, d. 37 in., l. 7.0 cm.

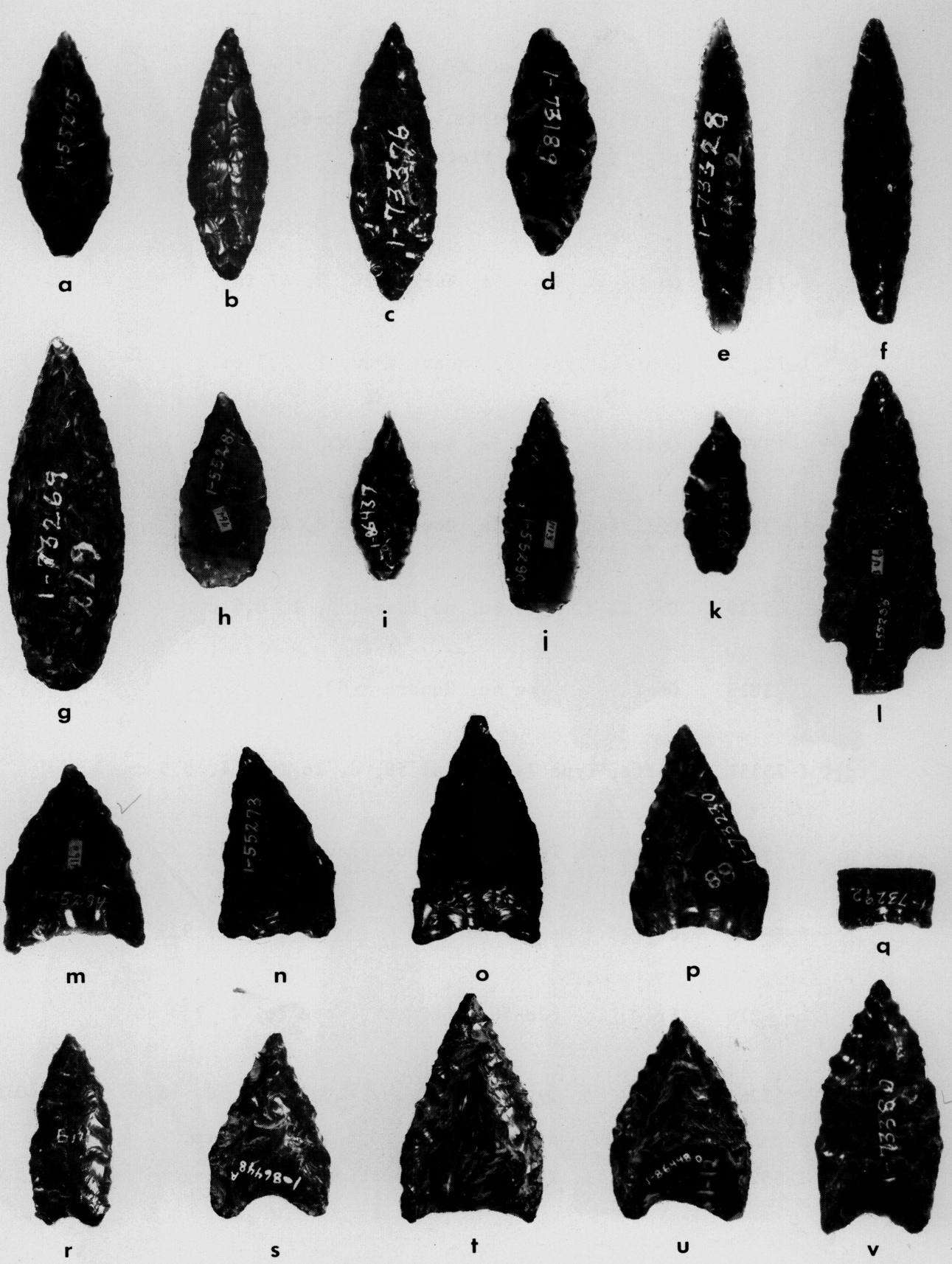


Plate 3

Projectile points, sites SJo-68, SJo-56

Plate 4

a. 1-73260 Obsidian, Type 5a, Burial 24, d. 47 in., l. 6.0 cm.

b. 1-73215 Schist, Type 5c, Square K/S2, l. 7.5 cm.

c. 1-73373 Obsidian, Type 5a, Square K/N3, d. 24 in., l. 7.5 cm.

d. 1-73246 Obsidian, Type 5a, Burial 24, d. 47 in., l. 5.5 cm.

e. 1-55239 Obsidian, Type 6c, no location, l. 6.0 cm.

f. 1-73219 Obsidian, Type 6c, Square H/N3, l. 5.5 cm.

g. 1-73357 Slate, Type 7a, Burial 58, d. 16 in., l. 5.5 cm.

h. 1-55257 Obsidian, Type 7d, Dawson grave lot 6, d. 27 in., l. 6.5 cm.

i. 1-73378 Chert, Type 7a, Burial 80, d. 18 in., l. 9.5 cm.

j. L-19210 From site SJo-56, Obsidian, Type 7b, l. 7.0 cm.

k. 1-55266 Obsidian, Type 6d, Dawson grave lot 9, d. 18 in., l. 8.0 cm.

l. 1-55297 Obsidian, Type 9a, no location, l. of fragment shown 4.5 cm.

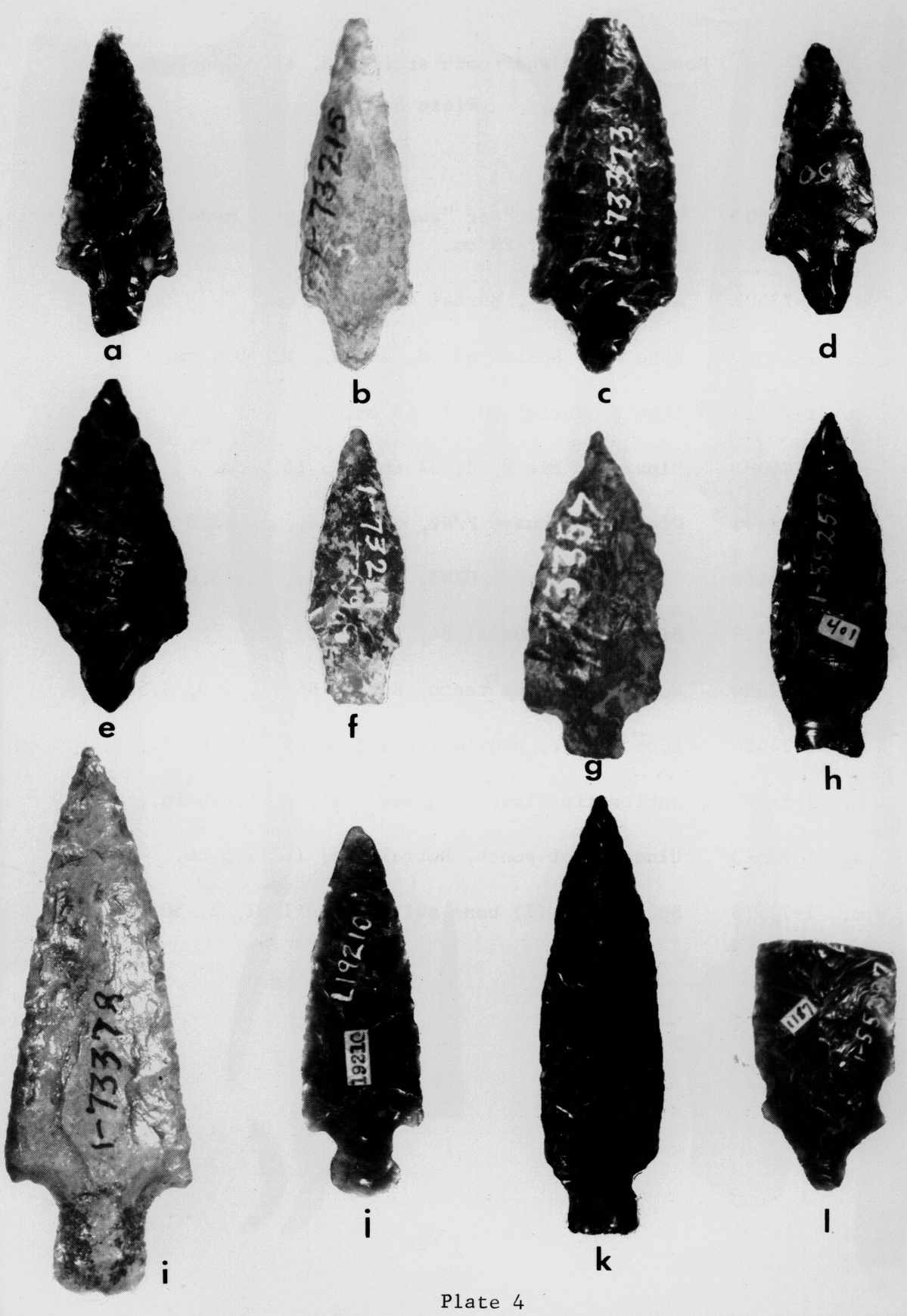


Plate 4

Bone, antler and tooth artifacts, site SJo-68

Plate 5

a. 1-73500 "Sweat scraper" or "sword" (strigil) made of elk scapula, Burial 51, l. 28 cm.

b. 1-73503 Antler "wand", Burial 49, l. 69 cm.

c. 1-73509 Bone awl, Burial 60, d. 44 in., l. 19.5 cm.

d. 1-73510 Like c, Burial 60, l. 18 cm.

e. 1-49087 Ulna awl, Pit B, d. 37 in., l. 13.5 cm.

f. 1-73496 Ulna awl, Square F/N2, d. 32 in., l. 12.0 cm.

g. 1-73488 Ulna awl, Square C/N3, d. 15 in., l. 15.0 cm.

h. 1-73529 Bird talon, Burial 84, l. 4 cm.

i. 1-73524 Wolf (?) canine teeth, Burial 86, l. 3.0, 3.5 cm.

j. 1-74424 Bone needle, proximal end grooved, Burial 73, l. 6.0 cm.

k. 1-86442 Antler tip flaker, Square _/S1, d. 12-24 in., l. 8.5 cm.

l. 1-73513 Ulna awl or punch, Burial 62a, l. 12.5 cm.

m. 1-73515 Split bird (?) bone awl, Square I/N1, d. 50 in., l. 13.5 cm.

Plate 5

Baked clay, shell objects and quartz crystal, site SJo-68

Plate 6

a. 1-73628 Baked clay pot wall, Square J/N4, d. 61 in., h. 8.0 cm.

b. 1-73822 Baked clay pot wall, Square A/N1, h. 4.5 cm.

c. 1-73615 Baked clay ball with basketry impression, Square B/S2, max. dia. 6.0 cm.

d. 1-55355 Perforated clay disc, Dawson grave lot 9, dia. 3.5 cm.

e. 1-55348 Like d , Dawson grave lot 33, dia. 3.5 cm.

f. 1-73482 Quartz crystal, Burial 66, l. 7.0 cm.

g. 1-73633 Baked clay "pecan", Burial 86, l. 2.5 cm.

h. 1-73577 Haliotis ornament type c(2), Burial 84, dia. 5.5 cm.

i. 1-73578 Haliotis pendant, type F.2,a, Burial 84, l. 3.5 cm.

j. 1-19068 Haliotis pendant type H.2.n, Burial 41, l. 5.0 cm.

k. 1-19205 Turtle carapace with Haliotis type 1a bead appliqué, Burial 6, l. 4.5 cm.

l. 1-19204 Like k, Burial 6, l. 4.0 cm.

m. 1-49064 Olivella rectangular beads type 2b, Burial 10, bead l. 1.0 cm.

n. 1-73579 Haliotis circular beads type 3, Burial 84, dia. 1.0 cm.

o. 1-73537 Olivella beads type 1a, Burial 19, bead l. 1.0 cm.

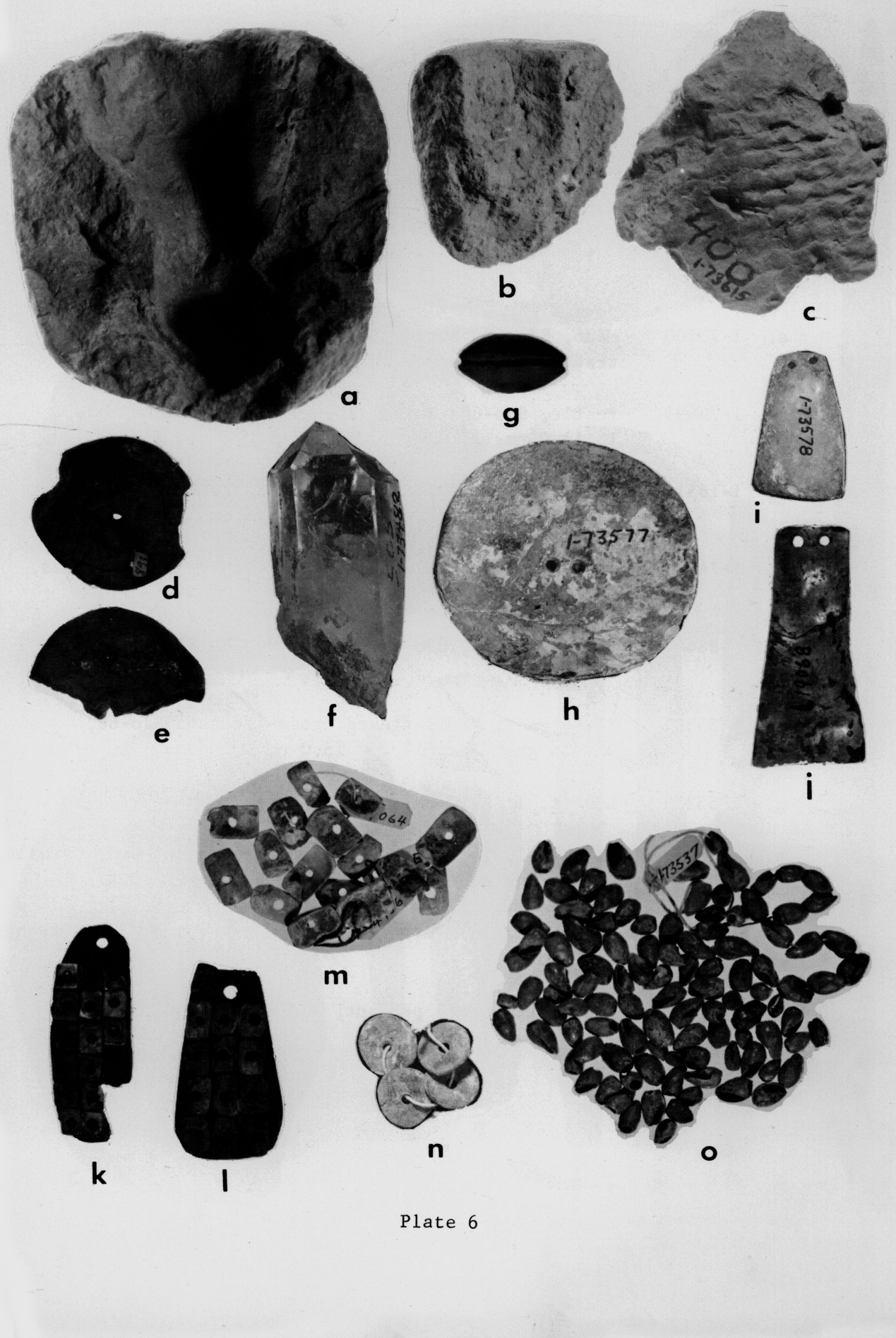


Plate 6

Ground stone and slate, sites Sac-168, SJo-68

Plate 7

a. 1-73700 Mano, SJo-68, Burial 80, unifacial grinding with traces of red ocher on one end, dia. 9.5 cm.

b. 1-73699 Pestle, SJo-68, Burial 80, grinding on both ends, l. 11.0 cm.

c. 1-165127 Mortar, Sac-168B, Square 8/N9, d. 26 inches, stained with red ocher, dia. 14.5 cm.

d. 1-74419 Green slate pencil, SJo-68, Burial 29, d. 53 inches, l. 6.5 cm.

e. 1-86447 Slate pendant, SJo-68, Burial 80, d. 18 inches, l. 9.5 cm.

f. 1-55331 Slate rod with flattened cross-section, SJo-68, Dawson grave lot 12, l. 15.0 cm.

g. 1-55334 Like f, l. 13.0 cm.

h. 1-55332 Like f, l. 14.5 cm., with groove at blunt end, parallel striations around middle.

i. 1-73451 Cylindrical slate rod, SJo-68, Burial 62a, d. 32 inches, l. 18.5 cm.

j. 1-55321 Perforated slate pendant, SJo-68, Dawson grave lot 7, l. 3.5 cm.

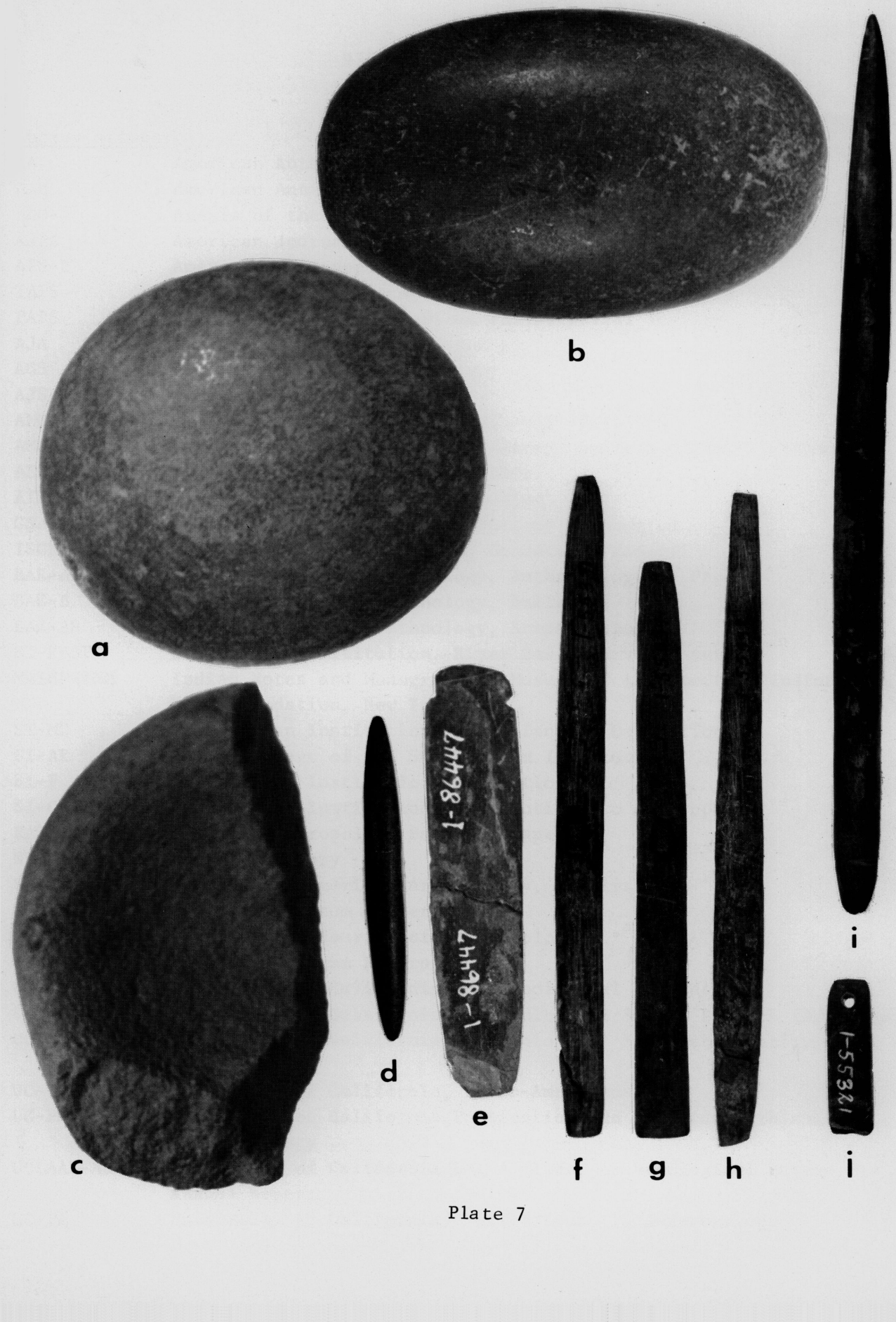


Plate 7

BIBLIOGRAPHY

Abbreviations:

AA	American Anthropologist
AAn	American Antiquity
AAG-A	Annals of the Association of American Geographers
AJPA	American Journal of Physical Anthropology
APS-Y	American Philosophical Society, Yearbook
TAPS	Transactions of The American Philosophical Society
PAPS	Proceedings of The American Philosophical Society
AJA	American Journal of Archaeology
AGS	American Geographical Society
AJS	American Journal of Science
AMNH-B	American Museum of Natural History, Bulletin
AMNH-AH	American Museum of Natural History, Anthropological Handbook
ABC	Anthropology in British Columbia
AINA	Arctic Institute of North America
GSA-B	Bulletin of The Geological Society of America
ISCM-OP	Idaho State College Museum, Occasional Papers
BAE-AP	Bureau of American Ethnology, Anthropological Papers
BAE-B	Bureau of American Ethnology, Bulletin
BAE-AR	Bureau of American Ethnology, Annual Report
SI-RBSP	Smithsonian Institution, River Basin Survey Papers
MAIHF-INM	Indian Notes and Monographs. Museum of the American Indian, Heye Foundation, New York
SI-MC	Smithsonian Institution, Miscellaneous Collections
SI-AR	Annual Report of the Smithsonian Institution
SI-P	Smithsonian Institution Publication
SI-CA	Smithsonian Institution Contributions to Anthropology
KAS-P	Kroeber Anthropology Society, Papers
NH	Natural History
SAA-M	Society for American Archaeology, Memoirs
SWM-M	Southwest Museum Masterkey
SWJA	Southwestern Journal of Anthropology
SWMP	Southwest Museum Papers
UC-AR	University of California Anthropological Records
UCAS-R	University of California Archaeological Survey Reports (Berkeley)
UCARF-Ms	University of California Archaeological Research Facility, Manuscript
UC-IA	University of California, Ibero-Americana
UC-PAAE	University of California Publications in American Archaeology and Ethnology
UCLAAS-AR	University of California Los Angeles, Archaeological Survey, Annual Report
UC-PA	University of California, Publications in Anthropology

UK-RA	University of Kentucky, Reports in Anthropology
UU-B	University of Utah, Bulletin
UU-AP	University of Utah, Anthropological Papers
USNM-R	Reports of the U.S. National Museum
VP-PA	Viking Fund Publications in Anthropology
UOM-SA	University of Oregon Monographs, Studies in Anthropology
CIW-Y	Carnegie Institution of Washington, Yearbook
CIW-P	Carnegie Institution of Washington, Publications

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