

**REVIEW AND DISCUSSION OF GREAT BASIN PROJECTILE POINTS:  
FORMS AND CHRONOLOGY**

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Projectile points have been important in Great Basin archaeological research because of their utility as time-markers. At many sites, such as those at which there is no preserved organic material suitable for chronometric dating, projectile points often provide the sole means presently available to the archaeologist for establishing chronological controls. The use of projectile points as chronological indicators or historical index types (cf. Steward 1954) is firmly established in New World archaeology (for a discussion of the use and abuse of projectile point typology, see Krieger 1960:145). We are fortunate that a number of projectile point styles with relatively short-term temporal and restricted spatial distributions have been recognized in the Great Basin. Since certain of these point groups or series have been placed in proper time context, through stratigraphic excavation and the association of radiocarbon assays, they have been widely used as fossiles directeurs by Great Basin archaeologists.\*

In this paper, we do not intend to revise or reorganize the existing Great Basin projectile point taxonomy. These classifications are "convenient" or "designed" types (cf. Hole and Heizer 1969:170-171), established by various archaeologists for their time-space significance (Rouse 1960:317). We have undertaken to review the dating of the major Great Basin projectile point types and to add some new data. There has been considerable previous research into the chronological ordering of point types in this region (Baumhoff and Byrne 1959; Heizer and Baumhoff 1961; Lanning 1963; O'Connell 1967; Clewlow 1967). This earlier work established the basic outline of "Medithermal" point sequence, and while new chronological information is provided in the following pages, the fundamental structure of this sequence remains unaltered (cf. Fowler 1968:13). Distribution of radiocarbon dates applicable to several Great Basin projectile point forms is shown in Figure 8, and from this a generalized projectile point sequence can be inferred.

Some comments are also provided here on the weaknesses inherent in the definition of certain of the types. Along similar lines, Thomas (1970) has suggested a technique ("key 1") for the objective quantification of regional point type attributes. Aside from recognizing some problems in the definition of the Rose Spring and Pinto series, Thomas' technique "reproduces the accepted Great Basin types" (Ibid.:48).

Projectile point types in the Great Basin have been generally designated by a binomial descriptive system. Earlier research, such as that reported by the Campbells in 1935 and 1937, used a monomial system in naming point types. The first term in the binomial system now in use refers to the site at which the stratigraphic position of the type was first established; the second designator is descriptive of some aspect of the point's form. In this paper, we have followed the lead of Lanning (1963, cf. Krieger 1944:282) by grouping, where possible, several related point "types" (e.g. Elko Eared, Elko Corner Notched, Elko Side Notched) into a series.

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\* Obsidian hydration analysis has also been used in efforts to determine the sequence of Great Basin point styles (Layton 1970, 1972b, 1973). Because of the many variables involved, the results of these analyses must still be considered tentative.

Despite the concern with projectile points evidenced in Great Basin research, there is still considerable confusion apparent in the literature regarding the application of some projectile point categories. This undoubtedly results in large part from the fact that some of the point forms have never been adequately illustrated; for example, the specimen identified by Layton (1972a:27) as Black Rock Concave Base point is not at all like the type specimens originally described by Clewlow (1968). It is hoped that the line drawings published here will serve as a partial remedy. Many of the previously published projectile point classifications include several variants, and these are mentioned in the text which follows. In the illustrations of the several point series (Figures 1-7), representative specimens have been selected, and in some instances, certain of the variations within the series are not shown. Instead, the illustrations present "typical" examples, emphasizing general morphological characteristics which exemplify each series.

#### The Humboldt Series (Figure 1)

The Humboldt series was first defined by Heizer and Clewlow (1968), based on materials from NV Ch 15, the Humboldt lake bed site. The points are lanceolate to triangular in outline, and three varieties have been identified: (1) "Concave Base A"; (2) "Concave Base B"; (3) "Basal Notched". Of these, Humboldt Concave Base A seems to be the most widespread. Several radiocarbon dates are available, most of which are primarily applicable to Humboldt Concave Base A.

DATE	LABORATORY NO.	SITE
1100 B.C. (3050 $\pm$ 200 B.P.)	LJ-289BB	Hidden Cave (Roust and Clewlow 1968)
1370 B.C. (3320 $\pm$ 200 B.P.)	LJ-212*	South Fork Shelter (Heizer, Baumhoff and Clewlow 1968)
2360 B.C. (4310 $\pm$ 40 B.P.)	UCLA-296*	do
2410 B.C. (4360 $\pm$ 300 B.P.)	UCLA-295*	do
3350 B.C. (5300 $\pm$ 380 B.P.)	WSU-994*	Hanging Rock Shelter (Layton 1970)
3920 B.C. 5470 $\pm$ 400 B.P.	WSU-511	Newark Cave (Fowler 1968)

\* These refer both to Humboldt Concave Base A and Humboldt Basal Notched forms.

The date of 1100 B.C. from Hidden Cave represents the termination of the Humboldt series at that site; Roust and Clewlow (1968:108) believe that the series does continue throughout the Great Basin projectile point sequence, becoming smaller in size through time. The series may have earlier origins than indicated by the ca. 4000 B.C. date from Newark Cave. For example, four specimens of Humboldt Concave Base A recovered from the Mud Flow gravels at Hidden Cave (Roust and Grosscup 1957) are attributed to the Anathermal climatic episode. Similarly, Humboldt points are found in Danger Cave II and III and in strata 5-10 (ca. 5300 B.C. to 650 B.C.) at Hogup Cave (Aikens 1970; Fry and Adovasio 1970). Thomas (1971:91) believes that Humboldt Concave Base A is equivalent in age to the Pinto series.

Layton (1970:249) has excavated Humboldt series points at Hanging Rock shelter. He divides his specimens into six numbered varieties (Nos. 1-6). Humboldt No. 1 is equivalent to Humboldt Concave Base A and B, and is believed by him to postdate the local Parman Phase of the early Anathermal (ca. 6000 B.C.?). Humboldt No. 2 points are the same as Humboldt Basal Notched, and their maximum popularity is dated at between the Altithermal maximum and 3350 B.C. (WSU-994).

Humboldt Basal Notched pieces are abundant in the central and southern San Joaquin Valley and in the southern Sierra Nevada uplands to the east (Hewes 1941:129; Bennyhoff 1956:44, Fig. 6 o-r). When the attempt is made to reconstruct the history of this form the California area will have to be considered.

#### The Pinto Series (Figure 2)

Pinto points were originally defined by Amsden (in Campbell and Campbell 1935:43-44) based on specimens recovered from the Pinto Basin site in the southwestern part of the Great Basin. More recent evaluations and discussions of Pinto series points have appeared in Harrington (1957) and Lanning (1963). Harrington's specimens were excavated from the Stahl site near Little Lake. On the basis of 497 specimens from the site, he established five varieties ("subtypes") which he called "shoulderless", "sloping shoulder", "square shoulders", "barbed shoulders", and "one-shoulder". Reference to these attributes is still made in the typological analysis of Pinto points in the Great Basin (cf. Heizer and Clewlow 1968). In his paper on the Rose Spring site, Lanning (1963:250-251) refers to Pinto points as the "Little Lake" series (see also Green 1972), in which he includes only those specimens from the Stahl site and Rose Spring.

Some investigators (Layton 1970; O'Connell 1971) have observed that the Pinto series is very broadly defined and loosely applied. Thus, in their particular areas, they have formed new typological constructs which incorporate forms included in the original Pinto series. In Surprise Valley, O'Connell (1971:68) has defined the "Bare Creek" series, with "sloping shoulder", "square shoulder" and "barbed" variants. Layton (1970), working in the High Rock area of northwestern Nevada, has proposed the "Silent Snake Bifurcate Base" (= Pinto Barbed) type. Layton believes the continued use of the type is "naive" (?) and suggests that there are important differences between Pinto points illustrated by Campbell

and Campbell (1935:Plate 13), and those shown by Harrington (1957:Figure 39). Layton is, of course, entitled to his own evaluation, but as we compare the two illustrated series, we can see remarkable similarities, especially if certain specimens such as a, d, (reminiscent of the Silver Lake type) and m from the Campbells' series are deleted. However, we will agree with Layton, O'Connell and others that the Pinto series is in need of further analysis and refinement. Until this is done, it seems preferable to retain the original designation (cf. Thomas 1971:89), as it still appears to have cultural-historical significance.

There have been many estimates as to the age of the Pinto series. It was once thought to represent an "early" form (cf. Wormington 1957:168-169), although some, like Rogers (1939) guessed that it was much later. There are now several radio-carbon dates which can be applied to the question of their age.

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DATE	LABORATORY NO.	SITE
670 B.C.* (2620 ± 80 B.P.)	UCLA-1222	Rodriguez site (O'Connell 1971)
680 B.C. (2630 ± 110 B.P.)	RL-109	Swallow Shelter (G. Dalley, letter to R. F. Heizer, 1972)
1880 B.C.** (3830 ± 110 B.P.)	GaK-2387	Kramer Cave (D. Tuohy, letter to R. F. Heizer, 1971)
1920 B.C. (3870 ± 250 B.P.)	M-377	Stuart Rockshelter (Shutler, Shutler and Griffith 1960)
2100 B.C. (4050 ± 300 B.P.)	M-376	do
2360 B.C. (4310 ± 40 B.P.)	UCLA-296	South Fork Rockshelter (Heizer Baumhoff and Clewlow 1968)
3550 B.C. (5300 ± 380 B.P.)	WSU-994	Hanging Rock Shelter (Layton 1970)

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\* O'Connell has told Thomas (1971:89) that he believes this date to be ca. 300 years too late.

\*\* This is a significant date in that the Pinto specimen ("Bare Creek Eared") was attached to the wooden atlatl dart shaft which was dated.

Thus, it seems that the Pinto series may have been in use during the time between ca. 3000 B.C. - 700 B.C. It is possible that the type began somewhat earlier, if we accept the occurrence of Pinto-like points in the Aeolian Silt

layer at Hidden Cave, as belonging to the Altithermal temperature age (Roust and Grosscup 1957; Roust and Clewlow 1968). Pinto series points occur at Hogup Cave in strata 3-9 (Aikens 1970), although they are most common in strata 7-9 which date roughly 1000 B.C. We do not think that an isolated "Pinto" from stratum 1 at Hogup (ca. 6400 B.C.) can be truly assigned to this type (cf. Aikens 1970:40). At Weston Canyon rockshelter, Idaho, barbed or square-shouldered Pinto points are said to appear prior to 5200 B.C. (S. Miller, in Green 1972:14).

### The Elko Series (Figure 3)

The Elko type was originally defined by Heizer and Baumhoff (1961, see also Heizer, Baumhoff and Clewlow 1968 for specimens from the type site, South Fork Shelter). There are several varieties including "side notched", "eared", "corner notched", and "contracting stem". The series is found widely throughout the Great Basin (including the Lake Bonneville area), and is particularly abundant in central and western Nevada. A study of the significance of this series (particularly the eared and corner notched varieties) as a time-marker was carried out by O'Connell (1967). On the basis of data available at that time, O'Connell (*Ibid.*:134-135) postulated that the type appeared in the eastern basin after 1300 B.C., and in the central and western basin, between 1500-500 B.C. The type then declined in popularity in the early Christian era, terminating around A.D. 500-600. There is some evidence, suggested on stratigraphic evidence by Bedwell (1970), that Elko series points occur in the Fort Rock area of Oregon at a much earlier date.

Radiocarbon dates linked to the Elko series are listed below:

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DATE	LABORATORY NO.	SITE
A.D. 1080 (870 $\pm$ 100 B.P.)	RL-43	O'Malley Shelter (Madsen 1971)
A.D. 1060 (890 $\pm$ 100 B.P.)	RL-42	do
A.D. 370 (1580 $\pm$ 90 B.P.)	GaK-3610	Gatecliff Shelter (D. Thomas, letter, 1972)
A.D. 280 (1670 $\pm$ 80 B.P.)	GaK-3609	do
A.D. 130 (1820 $\pm$ 180 B.P.)	I-2846	Shaman's burial (site NV-Wa-1016) near Pyramid Lake (Tuohy and Stein 1968)
30 B.C. (1980 $\pm$ 110 B.P.)	RL-41	Conway Shelter (D. Fowler, letter to R. F. Heizer 1971)
100 B.C. (2050 $\pm$ 110 B.P.)	RL-39	do
140 B.C. (2090 $\pm$ 110 B.P.)	RL-40	do



DATE	LABORATORY NO.	SITE
200 B.C. (2150 $\pm$ 100 B.P.)	I-3209	Rodriguez (O'Connell 1971)
290 B.C. (2240 $\pm$ 145 B.P.)	UCLA-1093A	Rose Spring (Clewlow, Heizer and Berger 1970)
330 B.C. (2280 $\pm$ 90 B.P.)	GaK-3617	Gatecliff Shelter (D. Thomas letter, 1972)
400 B.C. (2350 $\pm$ 150 B.P.)	LJ-76	Karlo (Riddell 1960)
680 B.C. (2360 $\pm$ 110 B.P.)	RL-109	Swallow Shelter (G. Dalley letter to R. F. Heizer 1971)
950 B.C. (2900 $\pm$ 80 B.P.)	UCLA-1093B	Rose Spring (Clewlow, Heizer and Berger 1970)
980 B.C. (2930 $\pm$ 200 B.P.)	LJ-203	Wagon Jack Shelter (Clewlow, Heizer and Berger 1970)
1020 B.C. (2970 $\pm$ 100 B.P.)	RL-44	O'Malley Shelter (Madsen 1971)
1100 B.C. (3050 $\pm$ 200 B.P.)	LJ-289BB	Hidden Cave (Roust and Clewlow 1968)
1190 B.C. (3140 $\pm$ 120 B.P.)	GaK-3615	Gatecliff Shelter (D. Thomas letter, 1972)
1370 B.C. (3320 $\pm$ 200 B.P.)	LJ-212	South Fork Shelter (Heizer, Baumhoff and Clewlow 1968)
1740 B.C. (3690 $\pm$ 100 B.P.)	GaK-3618	Gatecliff Shelter (D. Thomas letter, 1972)
1990 B.C. (3940 $\pm$ 120 B.P.)	RL-45	O'Malley Shelter (Madsen 1971)

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Summarizing briefly, the radiocarbon dates suggest a time span for the Elko series of ca. 2000 B.C. to A.D. 1080. However, it is possible that the two most recent dates (both from O'Malley shelter) may be aberrant, although at Hogup Cave, Aikens (1970) presents data which indicate the survival of the Elko Corner Notched variant to ca. A.D. 1350. In fact, the data from Hogup suggest that Elko Corner Notched may be completely useless as a time-marker (cf. Aikens 1970:51), as it appears in stratum 3 (ca. 6000 B.C.) and persists through stratum 14 (ca. A.D. 1350). Elko Eared points at Hogup first appear in stratum 1 at ca. 6400 B.C. and terminate in stratum 8 (ca. 1250 B.C.); the type is most common in stratum 5. These and similar data from Danger Cave (Fry and Adovaiso 1970; Aikens 1970), suggest an early origin for the Elko series in the eastern Great Basin.

The Rose Spring and Eastgate Series (Figure 4)

The Rose Spring and Eastgate types were originally defined as separate types, Rose Spring was named by Lanning (1963), and Eastgate by Heizer and Baumhoff (1961). Rose Spring has three varieties; (1) "side notched"; (2) "corner notched" (the most common); (3) "contracting stem". In the Eastgate series, there are "expanding stem" and "split-stem" forms. For additional descriptive information, see Lanning (1963), Heizer and Baumhoff (1961), Heizer and Clewlow (1968) and O'Connell and Ambro (1968).

In the past few years, many archaeologists working in the Great Basin have come to suspect that both series, since they usually occur together, represent in fact a continuum (cf. Heizer and Baumhoff 1961:128), with only minor morphological differences distinguishing the two groups. One of these differences, and one which has been used to separate the two series, is that on Eastgate points the barbs are usually squared (Heizer and Clewlow 1968; Heizer and Baumhoff 1961:Figure 2, o, g, and s). On the other hand, Eastgate points seem to have a distribution largely restricted to central and western Nevada, and Rose Spring points are found in most parts of the Basin.

There has recently come to light some new evidence bearing directly on the Rose Spring-Eastgate problem. An animal-skin pouch, found in a cave on the south shore of Lake Winnemucca, contained a variety of materials, the most important of which were a pressure-flaking tool and numerous projectile points, both finished specimens and blanks. A discovery such as this one, as in the finding of a cache of projectile points or a number of points associated with a burial, provides the ideal method of testing the validity of a typological construct. The materials in the pouch from the Winnemucca Lake are currently under study. There are 69 projectile points and 29 triangular blanks in the pouch. Based on comparisons with illustrated specimens of both series (Heizer and Baumhoff 1961; Heizer and Clewlow 1968; Lanning 1963), the specimens fit well with the Eastgate category. Most of the specimens have the distinctive squared barbs, and there are at least two Eastgate Split-Stem points. Those specimens without squared barbs have the thin, broad bodies (with convex lateral edges) and workmanship characteristic of Eastgate points from other sites. Only one small basalt specimen shows resemblance to the Rose Spring type. We believe that these findings support the postulate that the Eastgate type is a discrete entity, and that the series represents a local typological development in western and central Nevada.

Assembled below are radiocarbon dates for the Rose Spring and Eastgate series. Since the dates for both series overlap, it seems logical to present them in this manner.

---

DATE	LABORATORY NO.	SITE
A.D. 1720 (230 $\pm$ 100 B.P.)	RL-36	Conway Shelter (D. Fowler letter to R. F. Heizer 1971)
A.D. 1110 (840 $\pm$ 340 B.P.)	WSU-463	Newark Cave (Fowler 1968)

DATE	LABORATORY NO.	SITE
A.D. 1080 (870 $\pm$ 100 B.P.)	RL-43	O'Malley Shelter (Madsen 1971)
A.D. 1060 (890 $\pm$ 100 B.P.)	RL-42	do
A.D. 1010 (940 $\pm$ 100 B.P.)	RL-38	Conway Shelter (D. Fowler, letter to R. F. Heizer 1971)
A.D. 950 (1000 $\pm$ 90 B.P.)	GaK-3608	Gatecliff Shelter (D. Thomas letter, 1972)
A.D. 980 (940 $\pm$ 120 B.P.)	RL-47	Scott site (D. Fowler, letter to R. F. Heizer, 1971)
A.D. 900 (1050 $\pm$ 100 B.P.)	I-3208	Rodriguez site (O'Connell and Ambro 1967)
A.D. 740 (1210 $\pm$ 60 B.P.)	UCLA-1071F	Lovelock Cave (Heizer and Napton 1970)
A.D. 620 (1330 $\pm$ 90 B.P.)	GaK-2580	King's Dog Site (O'Connell 1971)
680 B.C. (2630 $\pm$ 110 B.P.)	RL-109	Swallow Shelter, Utah (G. Dalley, letter to R. F. Heizer, 1972)

On the basis of this date list, it would appear that both series experienced a major floruit between A.D. 600-700 and A.D. 1100, with examples continuing to be used into historic times. The date from Swallow Shelter is for Eastgate specimens found at that site, and it may be in error. However, obsidian hydration measurements of Rose Spring and Eastgate specimens from the High Rock area (Layton 1970) suggests that the types may have been in use by 300 B.C. or earlier. Similarly, Aikens (1970) presents stratigraphic data which would indicate the appearance of Rose Spring and Eastgate points in the eastern Great Basin at ca. 2500 B.C. More dates will be needed before this question is satisfactorily resolved.

Two local types which probably fit within the Rose Spring series have been defined for Surprise Valley, northeastern California (O'Connell 1971:64 ff). These are "Surprise Valley Split Stem" and "Alkali Stemmed", both of which occur in the Alkali phase. Both types appear to closely resemble Rose Spring series points, with "Alkali Stemmed" showing particular affinities with Rose Spring Corner Notched.

It is possible (in fact, it is highly likely) that the introduction of Rose Spring and Eastgate points can be equated with the introduction of the bow and arrow. There have been various guesses as to the date of the appearance of the bow and arrow in the Great Basin, ranging from 1250 B.C. to A.D. 1 (Grosscup 1957:380; Davis 1966:151; Grant, Baird and Pringle 1968:51; Aikens 1970:200). The Rose Spring and Eastgate series represent a "break" in the projectile point

sequence--the appearance of smaller and lighter points of the sort that were commonly used elsewhere in North America with the bow and arrow. Heizer and Baumhoff (1961) and O'Connell (1971:67) have suggested that the Rose Spring and Eastgate series may have developed out of the Elko series in response to the need for smaller points when the bow and arrow was introduced. If both series are indeed arrow points, then it seems that the date for the appearance of the bow and arrow might be closer to A.D. 500 or shortly after.

#### The Desert Side Notched Series (Figure 5)

Triangular, side notched arrow points are a common style in late pre-historic times in the Great Basin, and are characteristic of late phases from Mexico to the Northern Plains (cf. Kehoe 1966). In the Great Basin, these points are called "Desert Side Notched" (Baumhoff and Byrne 1959). Four major varieties ("sub-types") have been defined (Ibid.): (1) "General"; (2) "Sierra"; (3) "Redding"; and (4) "Delta" (the latter two being confined primarily to California). Baumhoff and Byrne (1959) postulated a date of A.D. 1500 for the introduction of Desert Side Notched points. Current radiocarbon dates for the series are listed here:

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DATE	LABORATORY NO.	SITE
A.D. 1720 (230 ± 100 B.P.)	RL-36	Conway Shelter ( D. Fowler letter to R. F. Heizer 1971)
A.D. 1710* (240 ± 100 B.P.)	GaK-2389	NV Wa 355 (Pyramid Lake; D. Tuohy letter to R. F. Heizer, 1971)
A.D. 1630 (320 ± 50 B.P.)	UCLA-1071D	Hesterlee site (Clewlow, Heizer and Berger 1970)
A.D. 1620 (330 ± 60 B.P.)	TX-1390	Thompson site (Elston and Davis 1972)
A.D. 1480 (470 ± 90 B.P.)	GaK-3613	Gatecliff Shelter (D. Thomas letter, 1972)
A.D. 1400 (550 ± 90 B.P.)	GaK-3614	do
A.D. 1360 (590 ± 90 B.P.)	GaK-3607	do
A.D. 1200 (750 ± 90 B.P.)	GaK-3606	do
A.D. 1110 (840 ± 340 B.P.)	WSU-463	Newark Cave (Fowler 1968)
A.D. 440 (1150 ± 110 B.P.)	WSU-245	Deer Creek Cave (Shutler and Shutler 1963)

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\* This radiocarbon assay is on an arrowshaft to which a Desert Side Notched point is attached.

The radiocarbon dates indicate that the Desert Side Notched type appeared sometime after A.D. 1100-1200 and persisted into the Historic era. The date of A.D. 440 from Deer Creek cave has been discounted as much too early by Shutler and Shutler (1963:51). However, there is a date of A.D. 20 (1930  $\pm$  40 B.P.; C-635) attributed to the type at Danger Cave (this is discounted by Aikens, 1970), and there are indications of a similar early occurrence of Desert Side Notched points at Hogup Cave (Ibid.)

Desert Side Notched points continued to be made and employed by Great Basin ethnographic groups. Layton (1970:225) found a Desert Side Notched specimen in association with the charred bones of a domestic cow at Hanging Rock Shelter, northwestern Nevada. From this he infers the use of the type by historic Northern Paiute.

#### The Cottonwood Series (Figure 4)

The Cottonwood series was originally proposed by Lanning (1963) in his analysis of projectile points from the Rose Spring site. He recognized two varieties: Cottonwood Triangular and Cottonwood Leaf-Shaped. A third variety, Cottonwood Bipointed, was later described by Heizer and Clewlow (1968). These small arrow points are common in late prehistoric and historic times in the Great Basin (for an example of the series in a historic context, see H. S. Riddell 1951). In many instances, Cottonwood points co-occur with specimens of the Desert Side Notched series. There are five radiocarbon dates which can be applied to the Cottonwood series:

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DATE	LABORATORY NO.	SITE
A.D. 1620 (320 $\pm$ 50 B.P.)	UCLA-1071D	Hesterlee site (Clewlow, Heizer and Berger 1970)
A.D. 1110 (840 $\pm$ 340 B.P.)	WSU-463	Newark Cave (Fowler 1968)
A.D. 1010 (940 $\pm$ 120 B.P.)	RL-38	Conway Shelter (D. Fowler letter to R. F. Heizer, 1971)
A.D. 980 (940 $\pm$ 120 B.P.)	RL-47	Scott site (D. Fowler, letter to R. F. Heizer, 1971)
A.D. 900 (1050 $\pm$ 100 B.P.)	RL-37	Conway Shelter (D. Fowler, letter to R. F. Heizer, 1971)

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These dates suggest that the series may have begun prior to ca. 1300 A.D., the date indicated by Lanning (1963) for its origin.

#### The Martis Series (Figure 6)

The Martis series was first described by Heizer and Elsasser (1953) on the basis of their work in the central Sierra Nevada of California. Eleven

subtypes (leaf shape, triangular, shouldered with contracting stem, side notched, barbed or tanged, quadrangular with angular contracting base, long narrow blade with concave edges, contracting stem with square base, side notched with blunted tip, side notched with shouldered tips) were distinguished. Recently, Elston (1971) has revised the classification to include three separate types: Martis Triangular, Martis Stemmed Leaf, and Martis Corner Notched. This series appears confined to the westernmost Great Basin, particularly that area around and to the east of Lake Tahoe, occupied in ethnographic times by the Washo. Elston (1971:35) considers the series to be a time marker of the Martis Complex, and based on radiocarbon dates from the Spooner Lake site, he places their age at 1000 B.C. to A.D. 500.

The Martis series is much in need of further study (cf. Elsasser 1960).

#### The Lake Mohave Type (Figure 5)

Lake Mohave points were first defined by Amsden (in Campbell et al. 1937:80 ff) based on collections from high terraces bordering Lake Mohave. The specimens are often lozenge-shaped, with long contracting stems and rounded bases. The type is a major element in the San Dieguito complex, and a specimen reminiscent of the type was found in the San Dieguito component at the C. W. Harris site (radiocarbon-dated between 6500-7100 B.C.; cf. A-724, A-722A, in Warren 1967). A Lake Mohave point found in deep deposits at Fort Rock Cave, Oregon (Bedwell 1970) bears an associated radiocarbon date of 11,250 B.C (13,200  $\pm$  720 B.P.; GaK-1738).

#### The Northern Side Notched Type (Figure 6)

Gruhn (1961) has applied this rubric to a series of large side notched points (with several variants; see Green 1972:34), one of the traits of the Bitterroot culture, an early adaptational pattern defined by Swanson (1966). In Idaho, Northern Side Notched points are believed to date between ca. 7000-1000 B.C.

However, specimens of this type are found in the Great Basin, particularly in the northern fringes, such as the High Rock country (Layton 1970) and in the Black Rock Desert (Clewlow 1968). In northern Nevada, Layton (op cit) believes that the type occurs earlier than the introduction of what he terms "Silent Snake" points (cf. Pinto). Northern Side Notched points were recovered by Riddell (1960) at the Karlo site (he termed them "Madeline Dunes" points). In Surprise Valley, O'Connell (1971) reports that Northern Side Notched points are a key element in the Menlo phase dated at ca. 5000-2000 B.C. Several radiocarbon dates are available for this phase, and one of them (I-4782; 3300  $\pm$  120 B.C.) appears to be directly referable to Northern Side Notched points. In the eastern basin, Northern Side Notched points are a part of the "Early Complex" at the Weston Canyon Rockshelter (Delisio 1971:52), dating ca. 5250-1300 B.C.

#### The Black Rock Concave Base and Great Basin Transverse Types (Figure 7)

In his research in the Black Rock Desert, Clewlow (1968) recorded a number of Paleo-Indian and other presumptively "early" projectile point forms.

Among these is a local type named Black Rock Concave Base by Clewlow (Ibid.: 13-14). In many respects, these are similar to the Plainview type of the Plains area, although the Black Rock Concave Base points tend to be considerably thinner than Plainview. The type exhibits parallel flaking and has light smoothing on the lower lateral edges.

Clewlow (1968) indicates that the Black Rock Concave Base type is a tentative one. It is clear that morphologically-similar points occur prior to 5000 B.C. in the Great Basin and constitute an element in the Western Pluvial Lakes Tradition (Bedwell 1970). However, the data from Hogup Cave suggests that the typological criteria for Black Rock Concave Base need to be more clearly defined.

Specimens usually referred to as "crescents" in the Great Basin literature (cf. Tadlock 1966) were found in numbers in the Black Rock Desert. Since these crescentic chipped stone objects are thought to have been used as transversely mounted projectile points and used in hunting waterfowl, Clewlow has designated them as the Great Basin Transverse type.

Both of these point types are assumed to be Anathermal in age (cf. Clewlow 1968) and are considered to be traits of the Western Pluvial Lakes Tradition (Bedwell 1970; Hester 1973). An anomalous situation apparently exists at Hogup Cave, where the Black Rock Concave Base type begins around 5850 B.C., yet survives to stratum 9, dated between 1250 and 650 B.C. Black Rock Concave Base specimens were the earliest points excavated by Layton (1970) at Hanging Rock Shelter; this worker reports obsidian hydration measurements indicating great antiquity for the type.

An "eccentric" crescent was found in the San Dieguito component at the C. W. Harris site, southern California (Warren 1967:Figure 2,d). Dates for the San Dieguito materials at that site range from 6540-7080 B.C. Crescents (in the typical form of the Great Basin Transverse point) have been excavated at the Connley Caves, Oregon (Bedwell 1970), and are attributed to his Period III which has a time span of 9000-6000 B.C. (the Western Pluvial Lakes Tradition).

An alternative view of the function of Great Basin Transverse points has been offered by Butler (1970:39). Butler's laboratory assistant examined 84 of these specimens (from Coyote Flat, southeastern Oregon) under low-power magnification. According to Butler (Ibid.), the results point to the use of these artifacts "as scrapers, as knives and as gravers". Unfortunately, Butler neglects to describe the types of wear which were observed on the specimens and which enable him to make this broad statement about their function. If his specimens are like those from the Black Rock Desert, they have undergone weathering and we suspect that most meaningful wear patterns (if present) might be badly obscured. In addition, extensive smoothing of artifact edges, a feature which usually indicates use, could have been caused on these specimens through weathering processes while they were exposed on the surface. Thus, we believe that Butler's hypotheses as to the use of these specimens require further test and we urge that when such tests

are made that the procedure and results be more fully described.

The hypothesis advanced by Tadlock (1966) and by Clewlow (1968) that Great Basin Transverse specimens served as projectile points has been partially tested in experiments at the University of California, Berkeley. Though these experiments are not wholly conclusive, they did show that such specimens, hafted as transverse points, did not affect the trajectory of a shaft while in flight and thus could have served as projectile tips.

#### The Gypsum Type (Figure 6)

Projectile points with triangular bodies and short, contracting stems were found by Harrington (1933) at Gypsum Cave, Nevada. He referred to the points as the "Gypsum Cave" type, and because of their apparent association with extinct fauna at the site, they have long been considered by many archaeologists as dating from Paleo-Indian times (Wormington 1957:157). However, radiocarbon analyses published by Heizer and Berger (1970) have established that the presence of man in Gypsum Cave is much more recent in time. Presently known information indicates that Gypsum points at Gypsum Cave date from sometime around  $450 \pm 60$  B.C. -  $950 \pm 80$  B.C. (UCLA-1069; UCLA-1223). Madsen (1971) reports finding 50 Gypsum points in Unit III at O'Malley shelter; these are radiocarbon-dated to 1790 B.C. ( $3740 \pm 170$  B.P.; RL-93).

#### Miscellaneous Early Man Points (Figure 7)

There are a variety of projectile points found at Great Basin sites which can be attributed to Paleo-Indian times. These include Haskett and "Haskett-like" points (Butler 1965, 1967), a trait of the Hascomat complex defined by Warren and Ranere (1968). These points are thought to date around 5000-6000 B.C. (there are applicable radiocarbon dates from Veratic Rockshelter, Idaho; Butler 1965). Another similar form is the Cougar Mountain point, described by Layton (1970, 1972b) as large, edge-ground points with tongue-shaped stems. These points, originally said to come from Cougar Mountain Cave, Oregon (Cowles 1960), may have been present in the Great Basin around 6500 B.C., if the date from Level 1 of Cougar Mountain Cave is considered to be applicable ( $8510 \pm 250$  B.P., UCLA-112). A major difficulty in accepting any evidence from Cougar Mountain Cave is that the site was pothunted and the "report" written by the looter is clearly unreliable. No amount of effort in reconstructing what the stratification and occurrence of artifacts can ever inform us reliably about the actual situation at the site before it was vandalized. Specimens resembling lanceolate points found at the Lind Coulee site (Daugherty 1956) have been reported by Clewlow (1968) from the Black Rock Desert; their age in the Great Basin is not known. Cascade points, characteristic of Butler's hypothetical Old Cordilleran culture (Butler 1961), are found in some sites in the northern Great Basin; for example, Weide (1968) places them in the "Early" period in Warner Valley, Oregon. Points similar to Cascade often occur in much later contexts, and they do not seem to be useful as chronological indicators. Finally, there are a variety of fluted points and many of these can be typologically linked to the Folsom and



Clovis types (cf. Hester 1973); some resemble fluted specimens found at the Borax Lake site, California (cf. Clewlow 1968 for such specimens in collections from the Black Rock Desert). In the Great Basin, fluted points have thus far been found in surface contexts. One exception is a fluted specimen found near the base of Fort Rock Cave, and linked by Bedwell (1970:180-181) to a radio-carbon date of 11,250 B.C. ( $13,200 \pm 720$  B.P.; GaK-1738). For a review of fluted point occurrences in the region, see Hester (1973:61-62, and Fig. 14).

#### Illustrations of Projectile Points

In Figures 1-7, we illustrate certain Great Basin projectile point styles. For the specimens shown, we have provided the catalog number (those having catalog numbers prefixed by 1- or 2- are stored in the Lowie Museum of Anthropology, Berkeley), the name or number of the site at which the specimen was collected, and the material of manufacture. The line drawings of the artifacts were prepared by Judith Ogden.

FIGURE 1  
THE HUMBOLDT SERIES

Humboldt Concave Base: a-d

- a, 1-65041; NV Ch 15; obsidian.  
b, 1-39071; NV Ch 15; obsidian.  
c, 1-39073; NV Ch 15; chert.  
d, 2-40263; NV Hu 22; chert.

Humboldt Basal Notched: e-h

- e, 1-45481; NV Ch 15; obsidian.  
f, 1-45480; NV Ch 15; obsidian  
g, 1-45485; NV Ch 15; obsidian.  
h, 1-65333; NV Ch 15; chert.

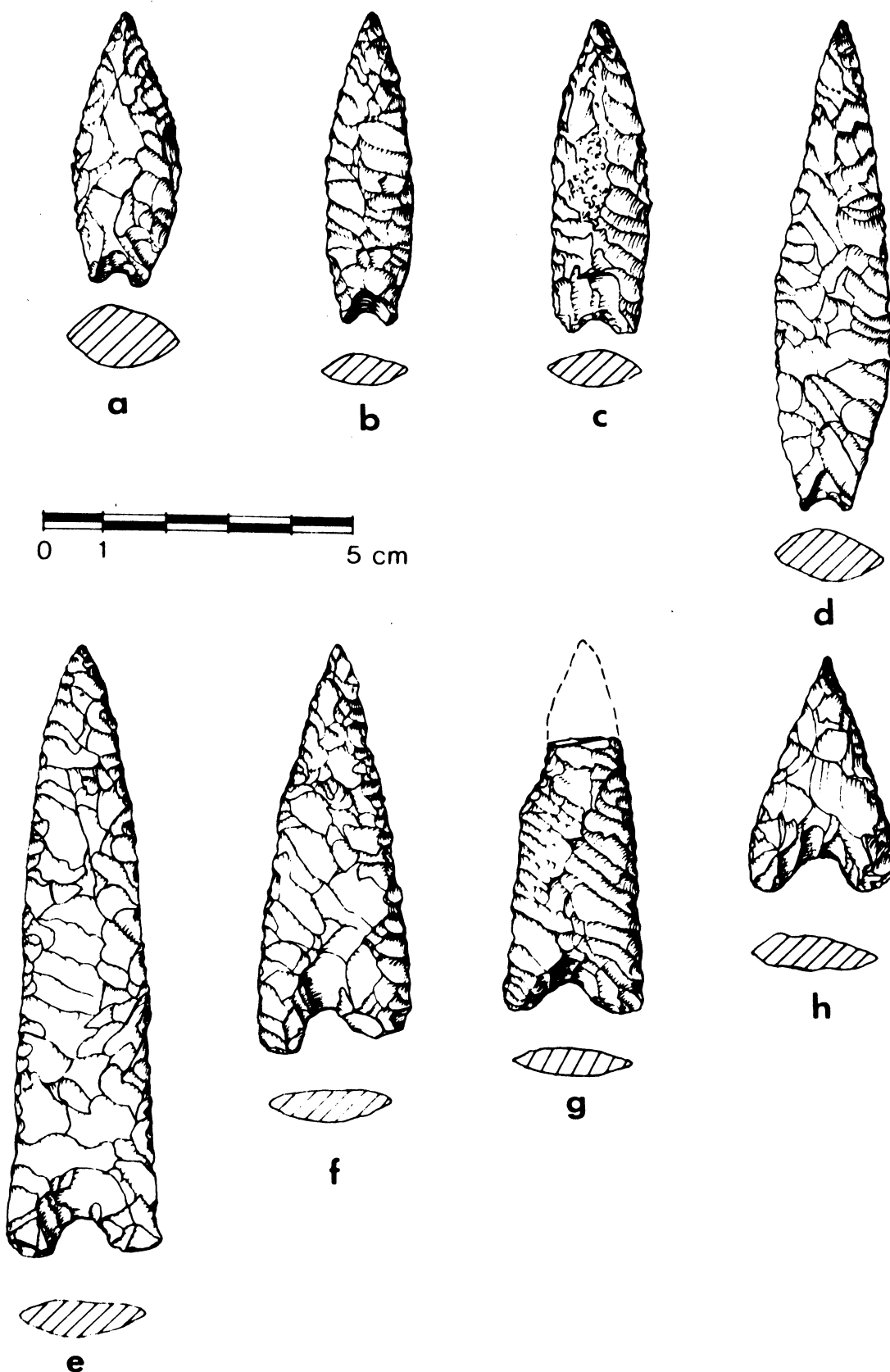


FIGURE 2  
THE PINTO SERIES

Pinto Square Shoulder\*: a-j, 1

Pinto Sloping Shoulder: k

a, 2-42810; east side, Black Rock Desert; obsidian.

b-d, Stahl site (Little Lake); from Harrington 1957:50; obsidian.

e, 1-65534; NV Ch 15; obsidian.

f, 2-42781; east side, Black Rock Desert; obsidian.

g, 1-65556; NV Ch 15; obsidian.

h, 1-65532; NV Ch 15; obsidian.

i, 2-21905; Hidden Cave; obsidian.

j, 1-65357; NV Ch 15; chert.

k, 2-41795; east side, Black Rock Desert; chert.

\* Here we follow Heizer and Clewlow (1968:63) in combining into this category Harrington's (1957) Square-shoulder and Barbed types.

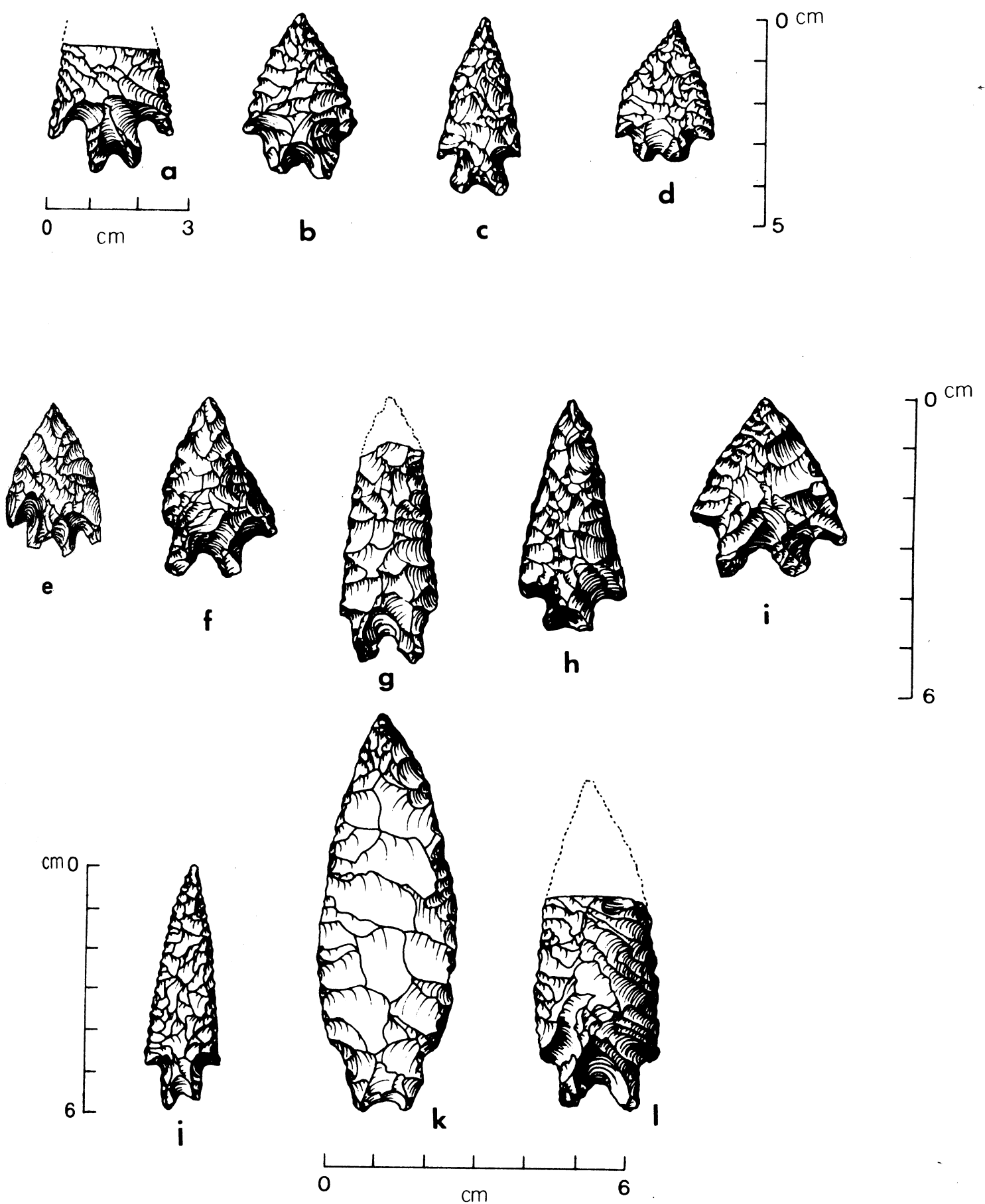


FIGURE 3  
THE ELKO SERIES

Elko Corner Notched: f, g, j

Elko Eared: a-e, h, i, k

- a, 1-65624; NV Ch 15; obsidian.
- b, 1-65625; NV Ch 15; chert.
- c, 1-65632; NV Ch 15; obsidian.
- d, 1-17465; NV Ch 15; obsidian.
- e, 1-17567; NV Ch 15; obsidian.
- f, field catalog S-83; NV El 11; chert.
- g, 2-47755; NV El 11; chert.
- h, 1-65538; NV Ch 15; obsidian.
- i, 1-65621; NV Ch 15; chert.
- j, field catalog S-28, NV El 11; chert.
- k, 1-65634; NV Ch 15; obsidian.

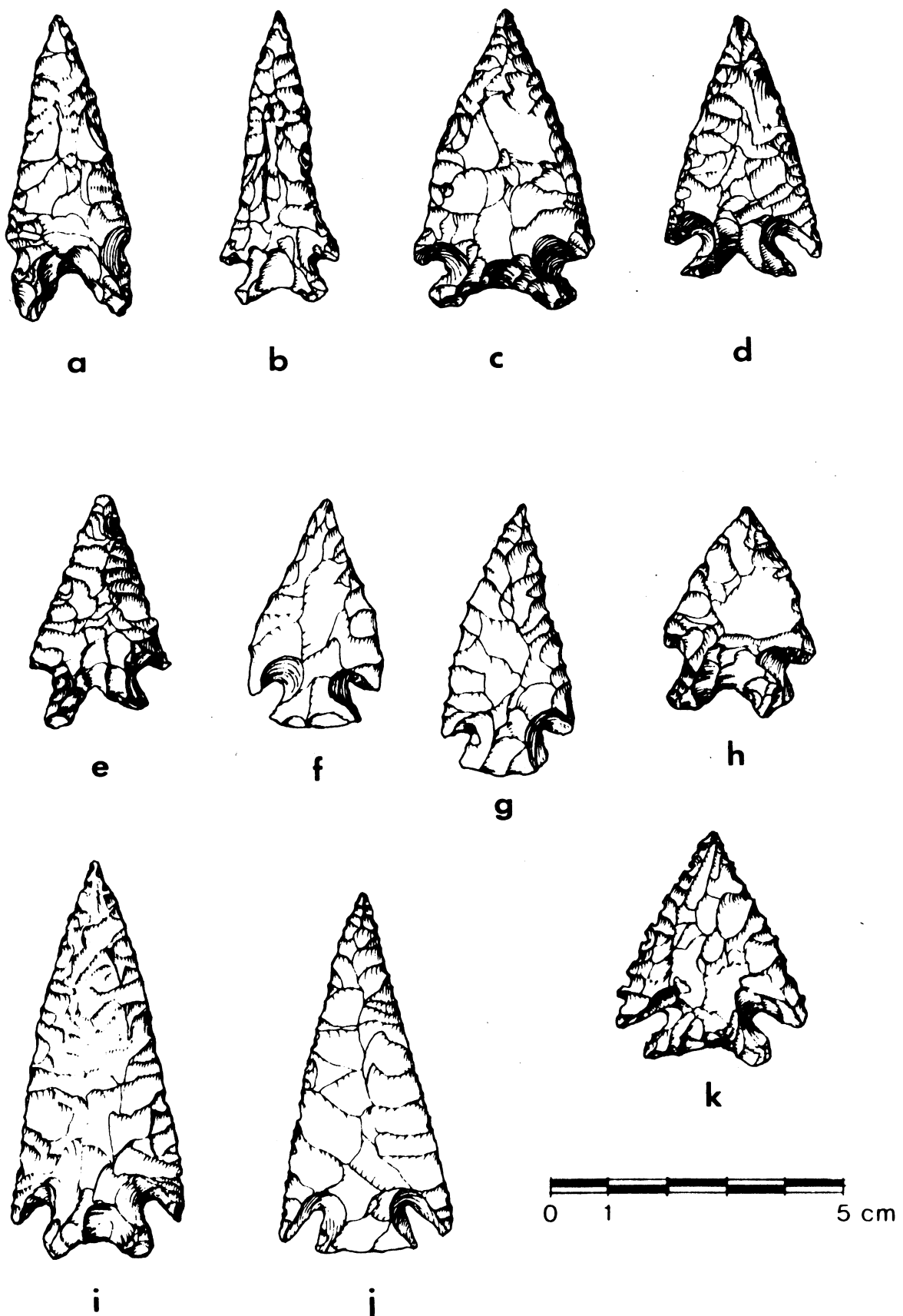


FIGURE 4

THE ROSE SPRING, COTTONWOOD, AND EASTGATE SERIES

Rose Spring Corner Notched: a, d-f

Rose Spring Contracting Stem: b, c

- a, 1-65617; NV Ch 15; chert.
- b, 1-19003; NV Ch 15; chert.
- c, 1-65382; NV Ch 15; obsidian.
- d, 1-65606; NV Ch 15; chert.
- e, 1-18814; NV Ch 15; obsidian.
- f, 1-18745; NV Ch 15; obsidian.

Cottonwood Triangular: g-k

- g, 1-65294; NV Ch 15; chert.
- h, 1-65085; NV Ch 15; chert.
- i, 1-65269; NV Ch 15; obsidian.
- j, 1-65291; NV Ch 15; chert.
- k, 1-65300; NV Ch 15; chert.

Eastgate Expanding Stem: l-q

Eastgate Split-Stem: r

- l, 1-65492; NV Ch 15; obsidian.
- m, illegible catalog number; chert.
- n, 1-65487; NV Ch 15; chert.
- o, 1-19059; NV Ch 15; chert.
- p, 1-65482; NV Ch 15; chert.
- q, illegible catalog number; chert.
- r, 1-19068; NV Ch 15; chert.

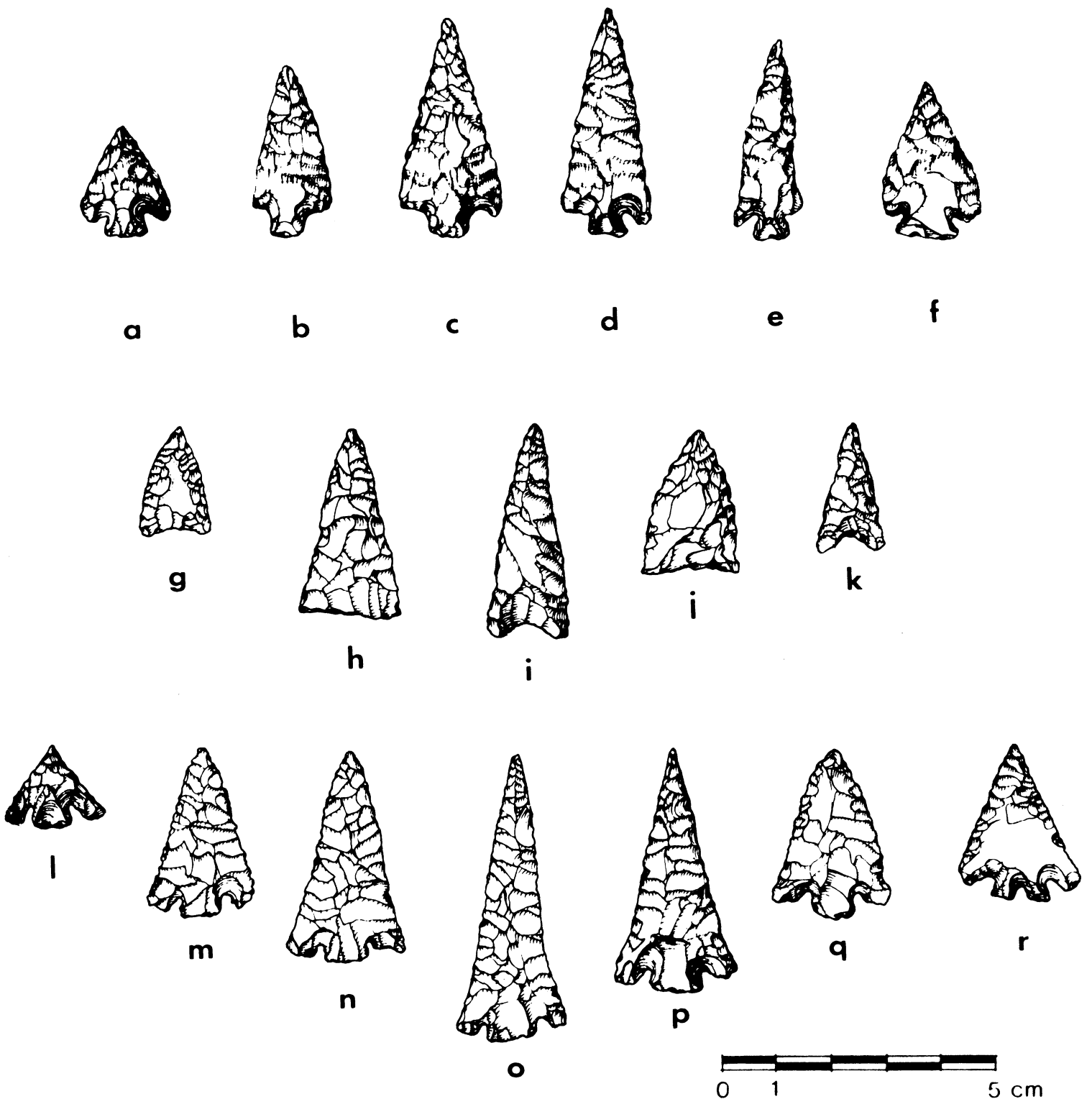


FIGURE 5

LAKE MOHAVE AND DESERT SIDE NOTCHED POINTS

Lake Mohave, a-c

a, Sadmat, Nevada; chert (after Warren and Ranere 1968: Fig. 2, i).

b, Lake Mohave, California; chert (after Warren and Ranere 1968: Fig. 3, d).

c, Lake Mohave, California; chert (after Warren and Ranere 1968: Fig. 3, e).

Desert Side Notched, d-i (all from NV Ch 15)

d, 1-65225; chert.

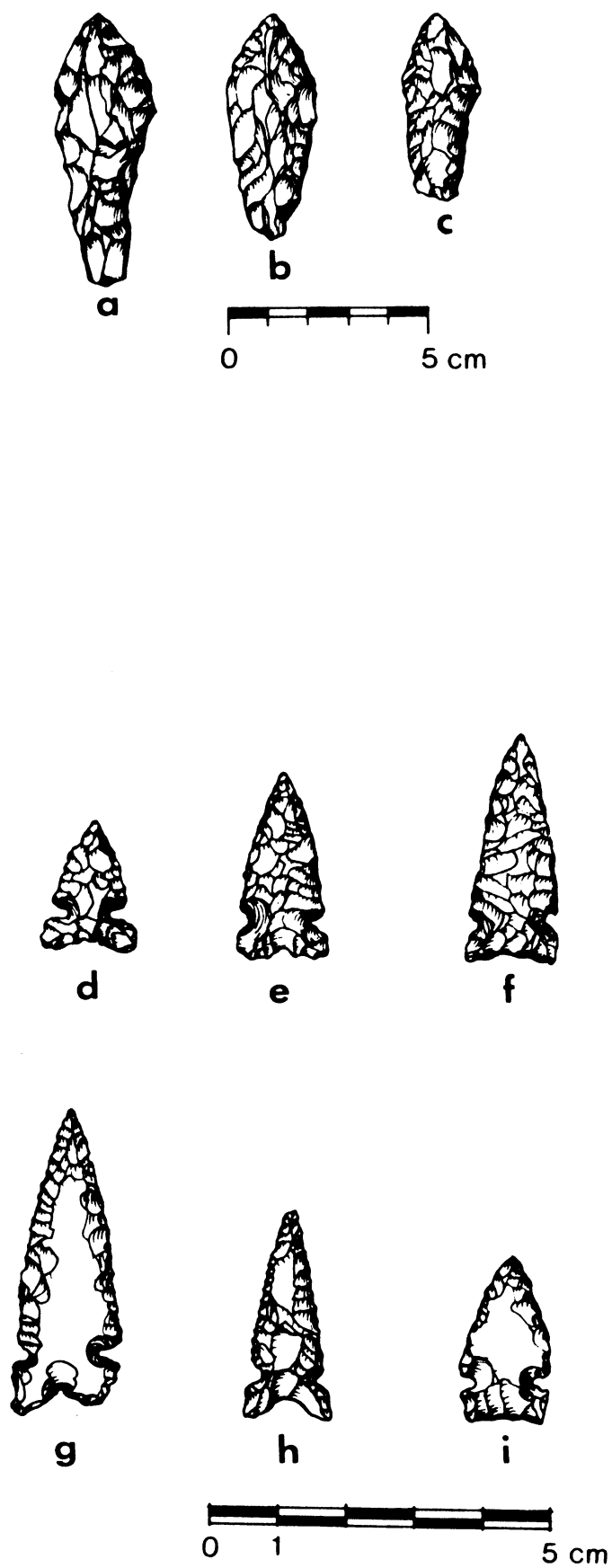
e, 1-65164; chert.

f, 1-65147; chert.

g, 1-65138; chert.

h, 1-65114; obsidian.

i, 1-65327; chert



GYPSUM, MARTIS, AND NORTHERN SIDE NOTCHED POINTS

Gypsum: a, b

a, b, Gypsum Cave; chert (from Harrington 1933:42, 44).

Martis: c-g (after Elston 1971: Fig 2)

c, Martis Triangular

d-f, Martis Corner Notched

g, Martis Stemmed Leaf

Northern Side Notched: h-l

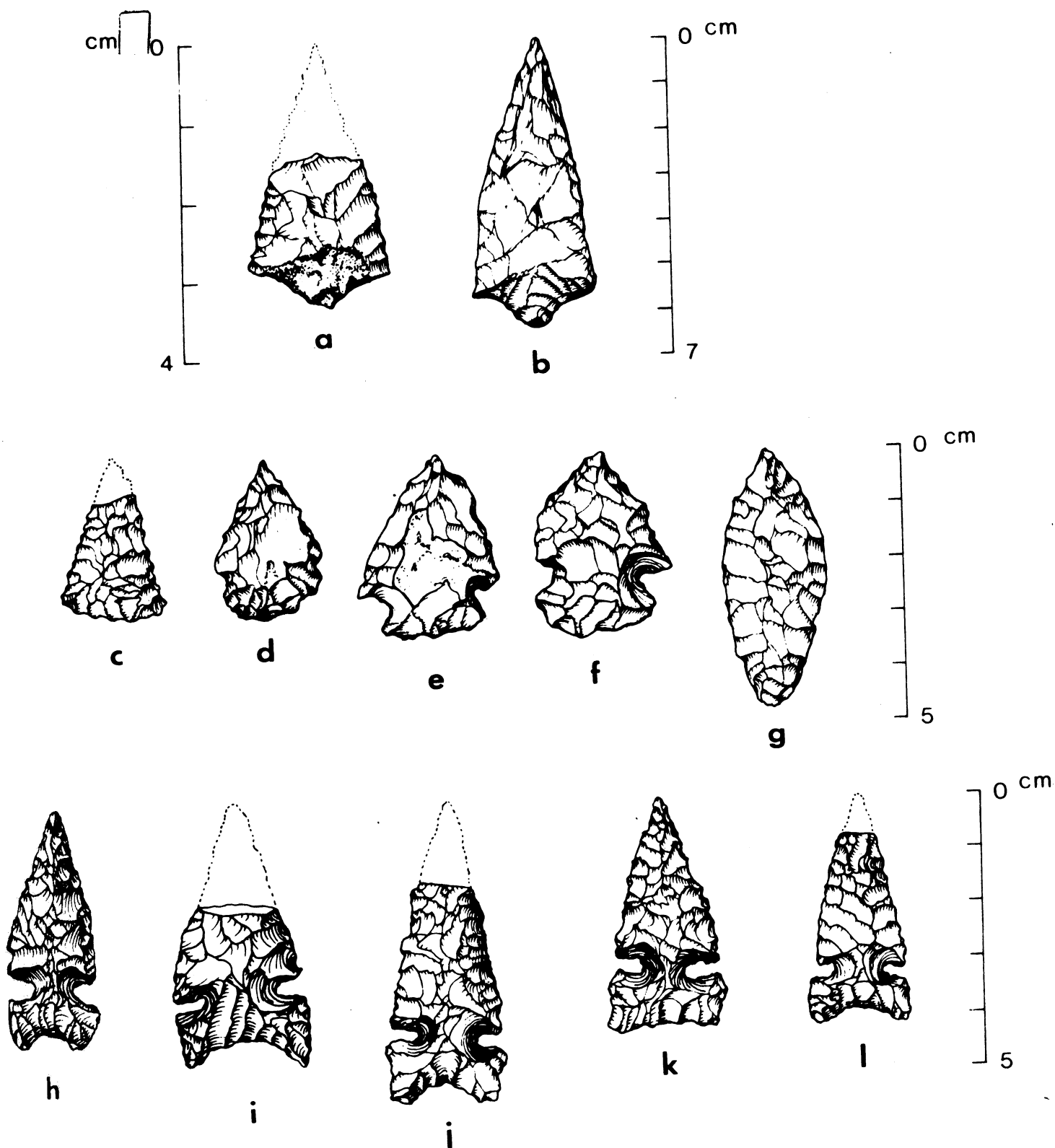
h, 2-40238; NV Hu 22; obsidian.

i, 2-42056; east side, Black Rock Desert; obsidian.

j, 2-42625; east side, Black Rock Desert; obsidian.

k, 2-42637; NV Hu 17; obsidian.

l, 2-42721; east side, Black Rock Desert; obsidian.



GREAT BASIN TRANSVERSE, FLUTED, AND BLACK ROCK CONCAVE BASE POINTS

Great Basin Transverse: a-f

- a, uncataloged; Black Rock Desert; obsidian.
- b, 2-39928; Black Rock Desert (Durban Collection); chert.
- c, 2-39940; Black Rock Desert (Durban Collection); chert.
- d, 2-39842; NV Hu 17; chert.
- e, 2-39742; NV Hu 17; chert.
- f, 2-40107; NV Hu 17; chert.

Fluted: g,h

- g, 2-41739; east side, Black Rock Desert; obsidian.
- h, 2-39912; NV Hu 17; chert.

Black Rock Concave Base: i-k

- i, 2-39909; NV Hu 17; chert.
- j, 2-39911; NV Hu 17; chert.
- k, 2-41724; east side, Black Rock Desert; chert.

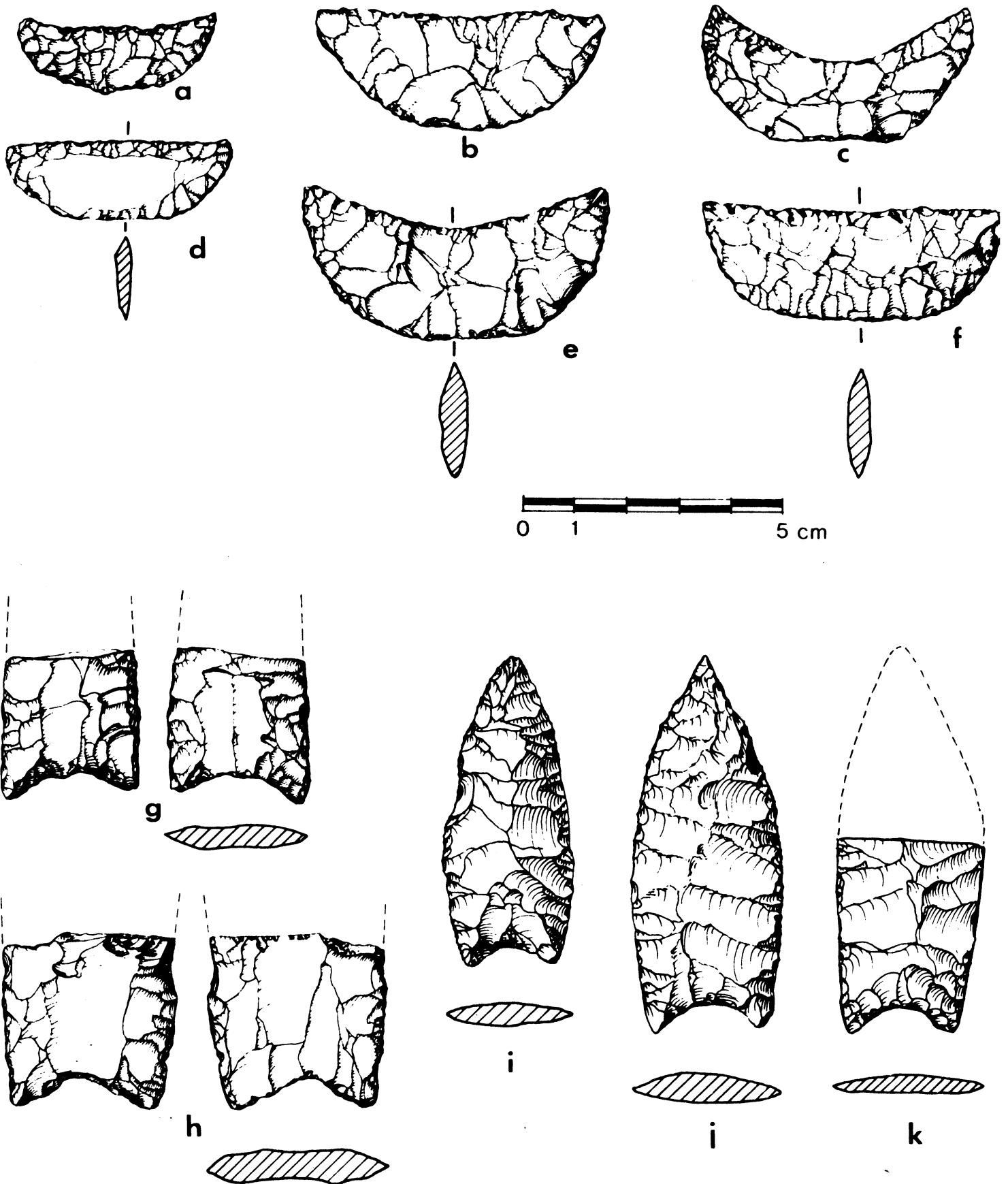




FIGURE 8

DISTRIBUTION OF RADIOCARBON DATES FOR  
CERTAIN GREAT BASIN PROJECTILE POINTS

Each dot represents the approximate temporal position of a radiocarbon assay. (after Hester 1973).

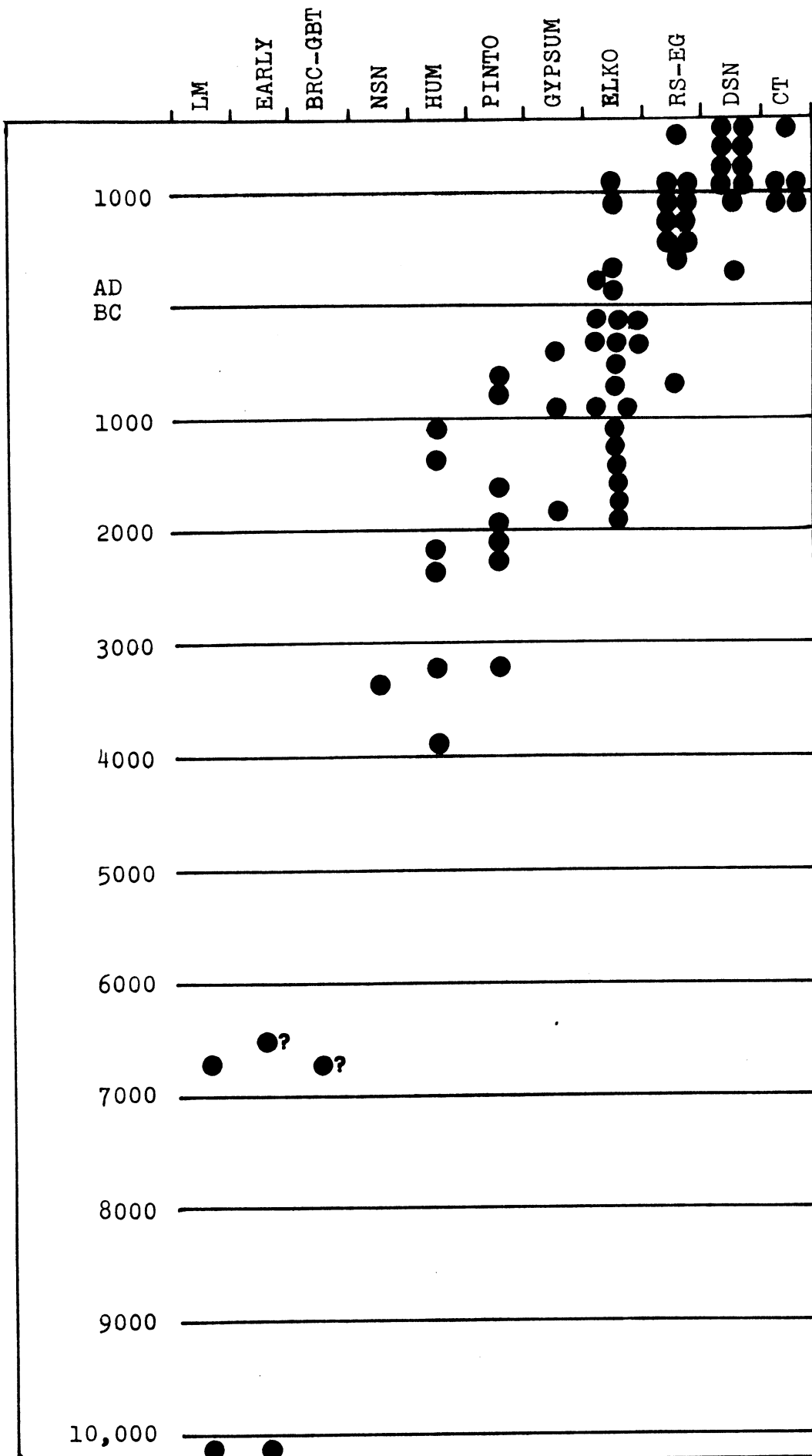
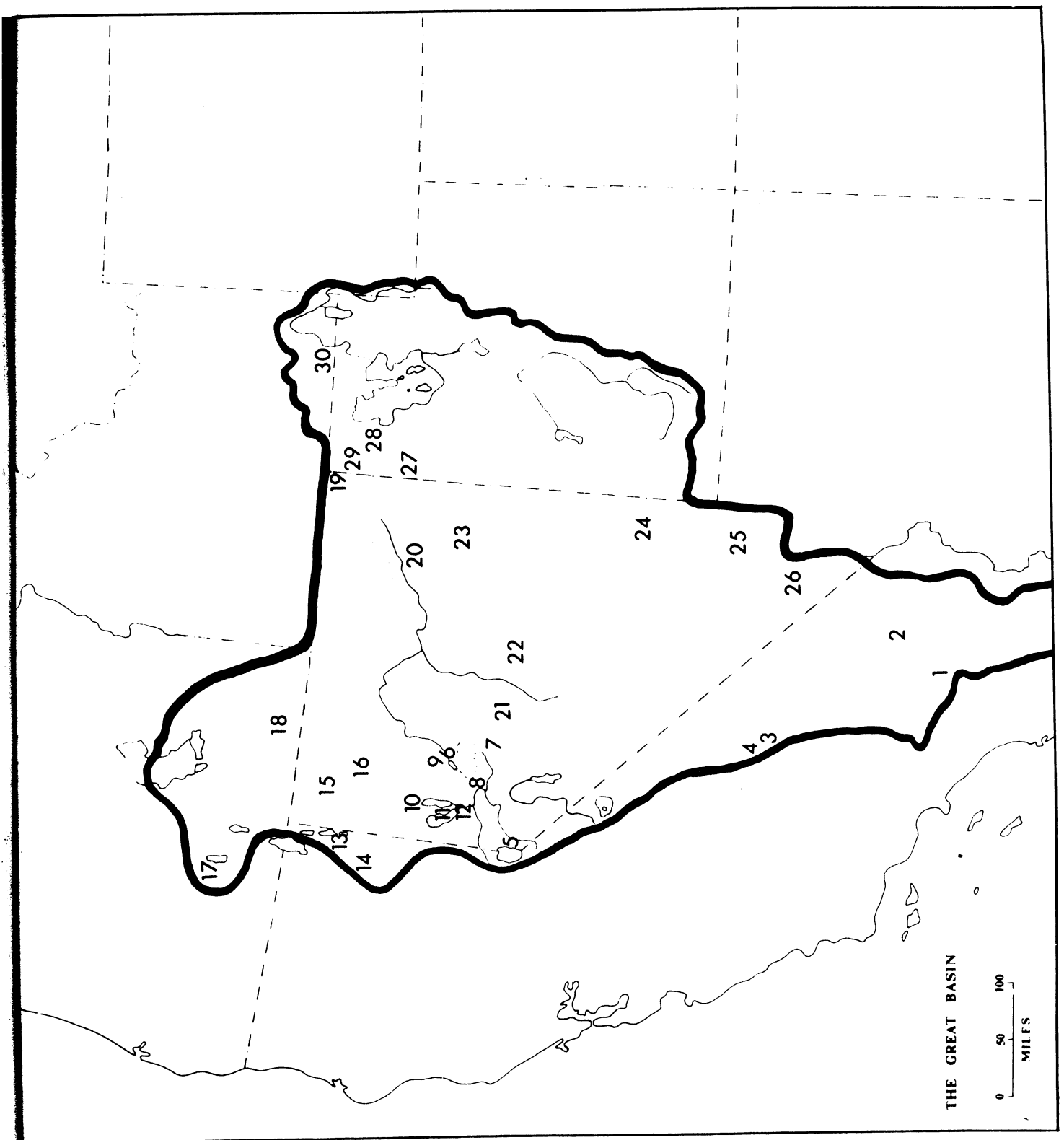


FIGURE 9

LOCATIONS OF CERTAIN ARCHAEOLOGICAL SITES AND LOCALITIES IN THE GREAT BASIN

- |    |   |    |  |
|----|---|----|--|
| 1  | Pinto Basin                                   | 16 | Black Rock Desert  |
| 2  | Lake Mohave                                   | 17 | Fort Rock Valley (including Connley Caves, Fort Rock Cave, Cougar Mountain Cave) |
| 3  | Stahl   | 18 | Coyote Flat  |
| 4  | Rose Spring                                   | 19 | Deer Creek Cave  |
| 5  | Spooner Lake and Thompson sites               | 20 | South Fork Rockshelter   |
| 6  | NV Ch 15 and Lovelock Cave                    | 21 | Wagon Jack Shelter   |
| 7  | Hidden Cave                                   | 22 | Gatecliff Shelter  |
| 8  | Sadmat  | 23 | Newark Cave  |
| 9  | Hesterlee (NV Pe 67)                          | 24 | Caliente area (including O'Malley Shelter, Conway Shelter, and Scott site)       |
| 10 | Kramer Cave                                   | 25 | Stuart Rockshelter   |
| 11 | NV Wa 355                                     | 26 | Gypsum Cave  |
| 12 | NV Wa 1016                                    | 27 | Danger Cave  |
| 13 | Surprise Valley (Rodriguez, King's Dog sites) | 28 | Hogup Cave   |
| 14 | Karlo   | 29 | Swallow Shelter  |
| 15 | Hanging Rock Shelter                          | 30 | Weston Canyon Rockshelter  |



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AA	American Anthropologist
A Ant	American Antiquity
NAS-R	Nevada Archeological Survey, Reporter
NSM-AP	Nevada State Museum, Anthropological Papers
SWM-P	Southwest Museum, Papers
UC-AR	University of California, Anthropological Records
UC-CARF	University of California Archaeological Research Facility, Contributions
UC-PAAE	University of California, Publications in American Archaeology and Ethnology
UCAS-R	University of California Archaeological Survey, Reports
UUAP	University of Utah, Anthropological Papers

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