ARCHEOLOGICAL RESEARCH IN GLEN CANYON, 1977

Schroedl

VOL. II

wall of this structure abutts the eastern wall of what was previously another room. The eastern wall, a common wall, was 18 cm. thick and only 90 cm. high. The western wall of this room, 90 cm. high and 25 cm. thick, has a centrally located doorway. The doorway is partially intact and originally was at least 66 cm. high and 50 cm. wide. The base of the door, set 30 cm. above the floor surface, is marked by a large sandstone slab doorsill. There are remnants of an adobe collar just above the slab, around the edges of the door. The slab sill has a groove parallel to the wall indicating that another slab was used to seal the doorway. This structure was probably a granary and antedates the room adjacent to the east.

Very little remains of the central room, only the eastern wall, which is shared with the first room and a portion of the southern wall (also wet-laid) which has a maximum height of 85 cm. but tapers out to nothing 1.7 m. further west. Another wall portion is found at the far western end of the ledge. This wall appears to have been dry-laid, possibly a retaining wall. Only a few courses remain with a maximum height of 52 cm.

The description of the structures presented here is highly suspect. There are numerous discrepancies between our observations and the original survey notes written in 1960. In that year the site was described as "three contiguous rooms, slab and mud construction, no roofs visible. Lintel in doorway of one room . . . 4-6 inches of blow sand, . . . walls partially collapsed." (Original survey notes for 42SA684 on file, Department of Anthropology, University of Utah). This description differs radically from what we found. There were not three contiguous rooms, no lintel in the doorway, less than 10 cm. (2 inches) of blow sand in the structure, no collapsed walls, and no mention of a dry-laid retaining (?) wall at the western end of the site. Since Lake Powell has never been high enough to flood this site, such drastic changes in less than twenty

years time can only be attributed to human agency, especially noting the fact that the lintel of the doorway had remained intact for at least 500 years.

The only conclusion that can be drawn from this is that visitors are doing a tremendous amount of damage to archeological sites in the Glen Canyon region, either purposefully or inadvertently. The presence of a "dry-laid" retaining wall has important implications for future archeological work in the Lake Powell area. It is clear that this wall was "reconstructed" from the collapsed portion of another wall by some visitor in the past twenty years. If the previous records were not available, the unsuspecting archeologist would have attributed this "wall" to prehistoric activity. This type of "reconstruction" by tourists was noted by Schroedl (1976a:47) in Lake Canyon, and it now appears to be a fairly wide-spread phenomena in the area.

42SA682

This site is 750 m. upstream from the mouth of North Gulch on the right bank of Moqui Canyon at a seep line. When the site was identified in 1960 it consisted of two low dry-laid walls of unshaped sandstone on opposite ends of a narrow ledge. No mention was made of distinguishable "rooms," but behind the walls "scattered charcoal and trash" were observed; no further work was undertaken.

The site was revisited in 1977 in order to map the structures. Working on one end of the ledge, the crew found "a room" that enclosed a smaller "cist-like structure," no artifacts, either historic or prehistoric were found in the thin layer of blow sand behind the structure. Neither the "room" nor the "cist" were observed in 1960. The only conclusion can be that recent visitors have been moving the sandstone spalls around and arranging them.

42SA5489

This site was first recorded in 1976 as a 1 m. by 1 m. dry-laid masonry structure with two associated adze-grinding grooves. Although Schroedl (1976a:47) suggested that the structure may have been of recent origin, the presence of the abrading grooves and the similarity of construction techniques between this site and 42SA683 (i.e. the use of lozenge-shaped "header" slabs for construction) seem to argue that this indeed was a prehistoric site.

Site 42SA5489 was again visited in 1977 to compare the site with the 1976 description. Again, recent visitor activity has disturbed the site. In 1977 the site consisted of two low-walled, contiguous rooms each about one meter square. Given the nature of these disturbances, the most that can be said about such a location is that it was probably a prehistoric site and contained one or more masonry structures, but we will never know the size, shape, or type of structure due to these disturbances.

Rappel Ruin (42SA683)

Rappel Ruin is located on the right bank of Moqui Canyon about 1 km. upstream from the mouth of North Gulch. The six room site is located in a SW-facing sandstone alcove in a cliff face about 40 m. above the alluvial terraces (Fig. 50). The alcove is about 70 m. long, but is relatively narrow measuring between 2 and 4 m. in width. Access to the site is by means of hand and toe holds up the cliff face (Fig. 51). Excavation gear was hauled up on ropes, and descent was made by rappeling, hence, the site name.

Modern vegetation collected in the vicinity of Rappel Ruin consisted of plants common to the Seeps and Springs, Terrace, and Hillside communities. Plants were collected near the seep in the alcove where the site is located and on the sandy alluvium about 60 m. below the alcove. The dominant plant was the

Figure 50. Archeologists working at Rappel Ruin (42SA683).

Figure 51. Cliff face and alcove in which Rappel Ruin (42SA683) is located.

seep at the back of the alcove, Adiantum capillus-veneris L. (southern maidenhair) of the Polypodiaceae (fern) family. The plants collected on the alluvium below the site are listed in Table 8.

The site consists of one wet-laid masonry granary and five contiguous rooms with dry-laid masonry walls of trapezoidal, sandstone slabs of various sizes that spalled from the rear walls and floor of the alcove (Fig. 52). The cliff face forms the rear wall of all the rooms except Room 4 which has a rear masonry wall. Rooms 1-5 are constructed with common dry-laid masonry walls; while Room 6 is a free-standing unit with clay plastering still partially visible on the interior walls. No evidence of doors and no floor features such as ventilator shafts, post holes, or hearths were encountered in any of the rooms.

The fill of each of the rooms consisted of fine wind-blown sand and some mixed organic material. Trash from recent visitors to the canyon was also noted in some of the disturbed deposits. The fill in the room was no more than 20 cm. thick. Artifacts are provenienced only to particular rooms and modern trash is not included. Much of the artifactual material came from in front of Room 3 in a deposit that included both prehistoric trash, feces and rat midden material.

ROOM 1

Room 1 is a rectangular room with internal dimensions of appx. 2 m. N-S, 1.18 m. E-W and is the southernmost room in the alcove. The south wall, which has slumped, abutts the cliff face and is 67 cm. high, 89 cm. wide, and curves toward the west. The western portion of the wall is 68 cm. high and 75 cm. wide. There is an opening that is appx. 60 cm. wide N-S, probably due to wall fall, located in the northwest corner of this wall. The north wall, which is common with the south wall of Room 2, is appx. 96 cm. high, 42 cm. wide, and on the eastern portion is constructed with small, linear trapezoidal or lozenge-shaped blocks laid to a height of appx. 63 cm. overlain by large, trapezoidal slabs

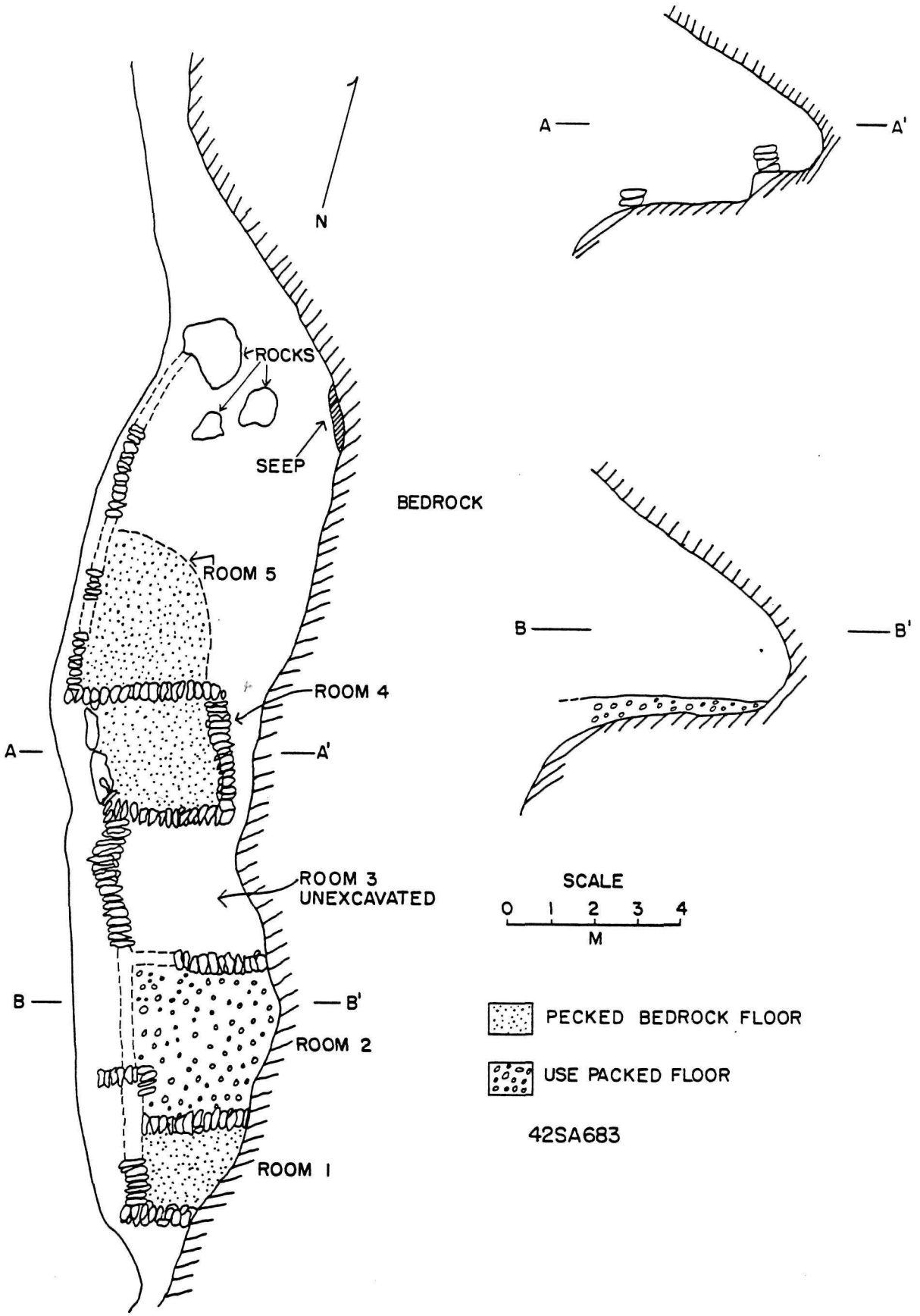


Figure 52. Planimetric map and cross section of Rappel Ruin (42SA683); room 6 is not shown

(Fig. 53, 54). These are then overlain by the smaller, linear slabs. The westernmost section of the wall is constructed with both sizes of slabs intermingled. The floor and rear wall have irregular surfaces due to the removal of the trapezoidal slabs.

ROOM 2

Room 2 is a rectangular room measuring 3.5 m. N-S, 2.3 m. E-W, and shares the south wall, which is 96 cm. high and 57 cm. wide, with Room 1, and the north wall, that is 74 cm. high and 58 cm. wide, with Room 3. The walls of this room are also constructed with layered, trapezoidal slabs of varying sizes. However, slabs were not removed from the rear wall nor from the floor in Room 2.

Overlying the bedrock floor is a use-packed, soil surface that was covered in most areas by a light gray, ashy layer, appx. 20 cm. deep, containing botanical materials, pot sherds, and other cultural items. The ashy layer and a rat midden above it both extended under the north wall indicating this wall was constructed after Room 2 and the south and west walls.

ROOM 3

Room 3 measures 3.15 m. N-S, 3 m. E-W. It is rectangular and shares a south wall that is 74 cm. high and 58 cm. wide with Room 2. The north wall, that is 1.25 m. high and 59 cm. wide, is shared with Room 4. A wall on the west, measuring appx. 1 m. high, can be seen in profile on the slope eroding away in front of the room. The wall construction is essentially the same as that in Rooms 1 and 2. Room 3 was not excavated.

ROOM 4

Room 4 is square with interior dimensions of 2.5 m. N-S and 2.5 m. E-W (Fig. 55), enclosed by walls on three sides. With the exception of the first course

Figure 53. Typical wall construction at Rappel Ruin (42SA683).

Figure 54. Room 1, Rappel Ruin (42SA683).

Table 8. List of Plants in Vicinity of Rappel Ruin (42SA683)

(T,H) BORAGINACEAE (borage family)

Cryptantha crassisepala !Torr. & Gray1 Greene (cryptantha)

(H) CHENOPODIACEAE (goosefoot family)

Salsola kali L. (Russian thistle)

(T) CRUCIFARAE (mustard family)

Stanleya pinnana !Pursh1 Britton (desert princesplume)

(H) EPHEDRACEAE (ephedra family)

Ephedra viridis Cov. (green mormon tea)

(T,H) GRAMINEAE (grass family)

Agropyron sp. (wheat grass)

Aristida purpurea Nutt. (purple three-awn)

Stipa sp. (needle grass)

(T,H) SOLANACEAE (potato or nightshade family)

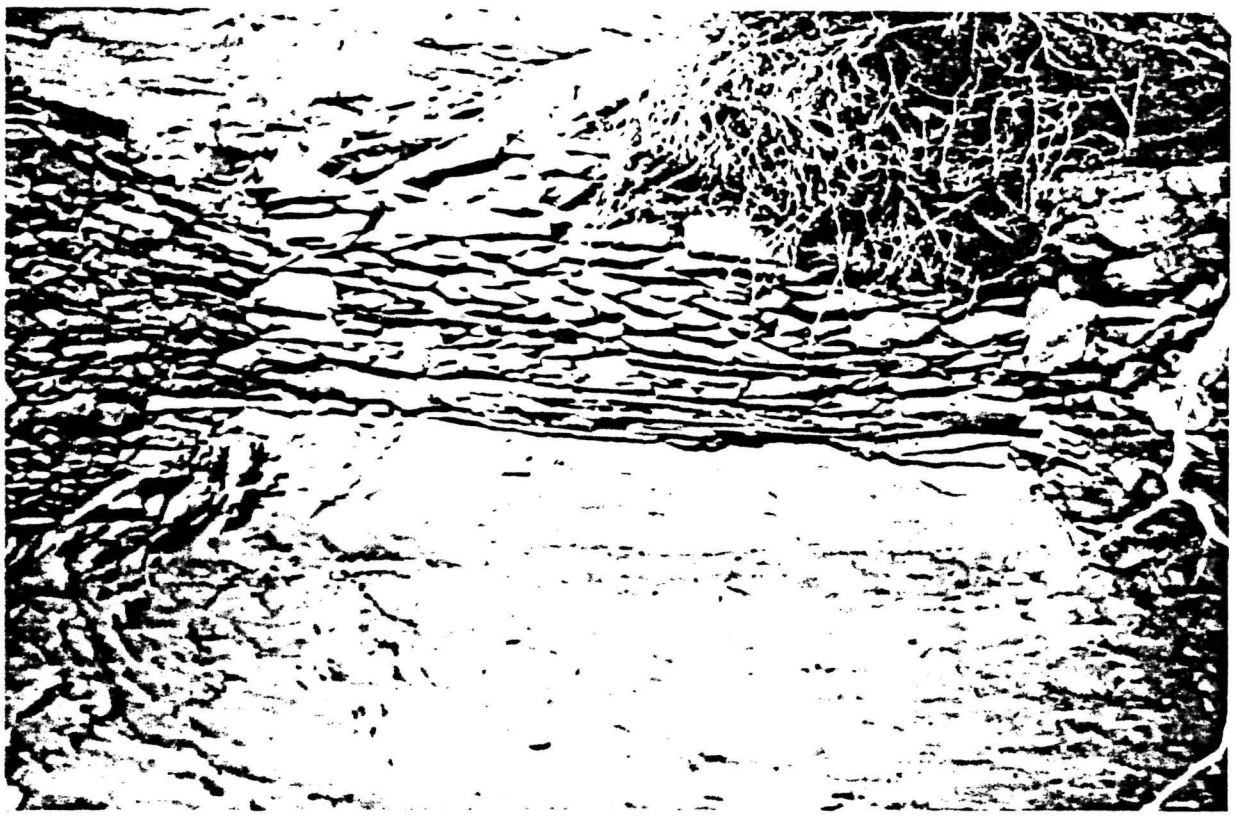
Datura meteloides D.C. (sacred datura; jimson weed)

(T,H) ULMANACEAE (elm family)

Celtis reticulata Torr. (netleaf hackberry)

T = Terrace Plant Community
H = Hillside Plant Community

Figure 55. Interior of Room 4 at Rappel Ruin (42SA683).



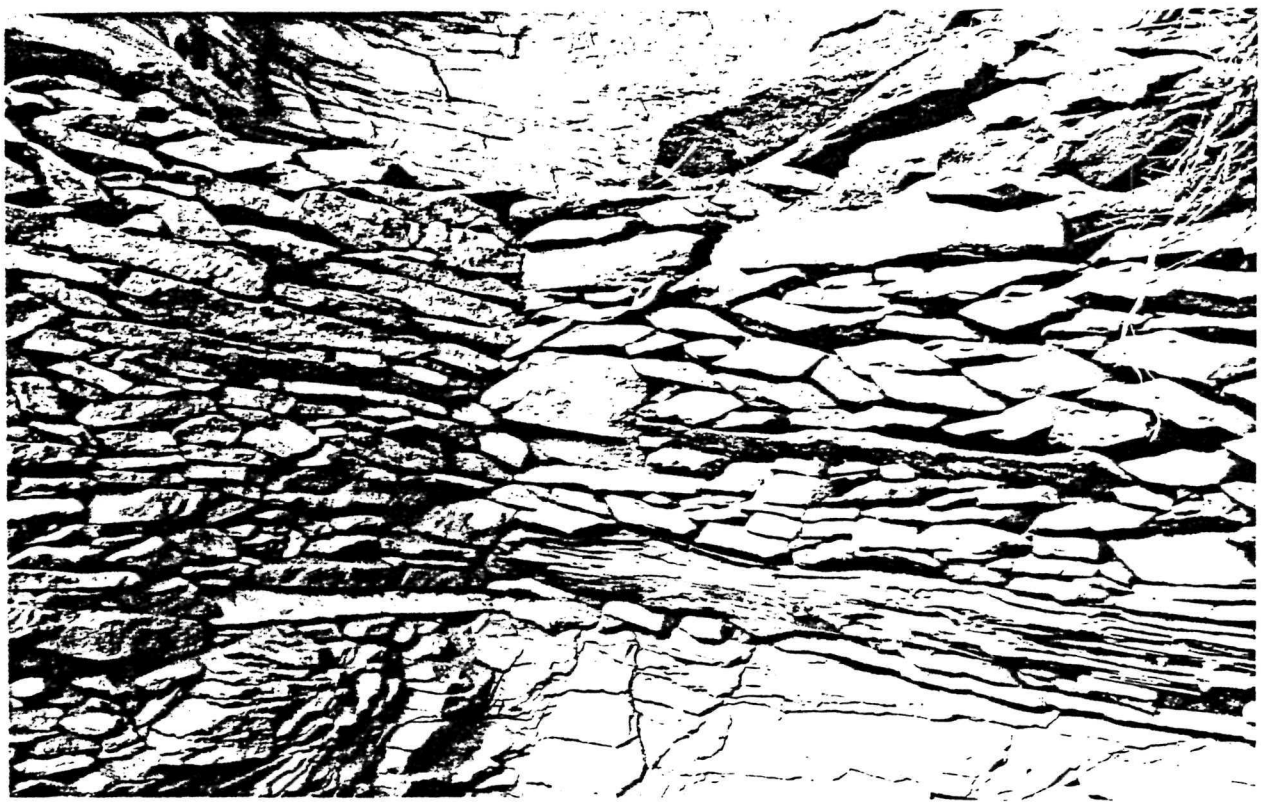
of masonry, the wall that faces out of the alcove has slumped away over the edge of the cliff. The north wall, which is common with the south wall of Room 5, is 1.3 m. high, 64 cm. wide; the construction technique is similar to that used in the other rooms. The bedrock floor slopes up to the rear of the alcove and the trapezoidal sandstones are layered upon it. The rear wall, which measures 1.55 m. high and is 1.4 m. wide, is constructed with a stripped log set on a rear ledge of the sloping bedrock floor. The log acts as a support for the rear, dry-laid wall constructed along the top of the ledge (Fig. 56). The south wall, which is shared with Room 3, is 1.24 m. high, 59 cm. wide and also utilizes a stripped log as part of the wall construction. However, this piece of wood is a short length placed near the southwestern corner of the wall to support the trapezoidal sandstone slabs surrounding it.

The floor of Room 4 is also of sandstone bedrock which slopes from east to west and from which the trapezoidal slabs have been removed. During excavation a layer of vegetal matter appx. 20-30 cm. deep was uncovered overlying the bedrock floor in the western portion of the room. The material consisted of grass, cordage, gourd rind, corn cobs, and other assorted matter overlain by a layer of reed grass. These materials suggest an attempt at leveling this section of the floor to compensate for the downward slope.

ROOM 5

Room 5 was probably rectangular but poor preservation of the walls, with only one intact, makes it impossible to define the northern and eastern extent of the room. The wall, on the south, is appx. 1.1 m. high, 64 cm. wide and is shared by Room 4. A partial west wall is intact in the SW corner, measuring appx. 1 m. high and has eroded down the slope. Where it can be discerned in profile, it measures appx. 1.8 m. high. Wall construction is essentially the same as that described in the other rooms. The floor also has an irregular bedrock surface due

Figure 56. Rear wall construction in Room 4 at Rappel Ruin (42SA683).



to the removal of the trapezoidal sandstone slabs. It is possible that this was never an enclosed room, but rather was a short retaining wall with trash packed behind it to form a level use area. Since the wall and the material behind it have slumped away in the front, the function of this "room" will never be known.

ROOM 6

Room 6 was probably a granary, at the northernmost end of the alcove and it encloses a semi-circular area, 1.85 m. N-S, 1 m. E-W. It is constructed of the same sandstone spalls as all other rooms in the alcove but the interior appears to have been plastered with mud. The wall abutts the cliff face on the north forming an arc to the west with heights varying from 10 to 65 cm. The floor has been pecked out in this room in the same manner as the rear walls and floors of Rooms 1, 4, and 5. A single fragment of cotton cloth was found in this structure.

42SA6317

This site was first recorded in 1977. It is a single rectangular dry-laid masonry structure located on a sandstone ledge at the top of a talus slope about 1.5 km. upstream from the mouth of North Gulch on the right bank of Moqui Canyon. The structure (Fig. 57) is about 5 m. E-W and about 2.2 m. N-S. The eastern and southern walls have slumped down the talus slope. The cliff face forms the rear wall of the structure; only three courses of masonry, 30 cm. high, still remain on the west wall. Some corn and squash remains as well as several knotted yucca leaves were recovered when this site was recorded and mapped.

42SA727

This site consists of a single, rectangular, dry-laid masonry structure in a small alcove about 1.75 km. upstream from the mouth of North Gulch on the right bank of Moqui Canyon. The east and west walls jut out from the cliff face and only three courses of masonry are still intact. There is evidence of recent looting—a large post hole in the center of the structure (Fig. 58).

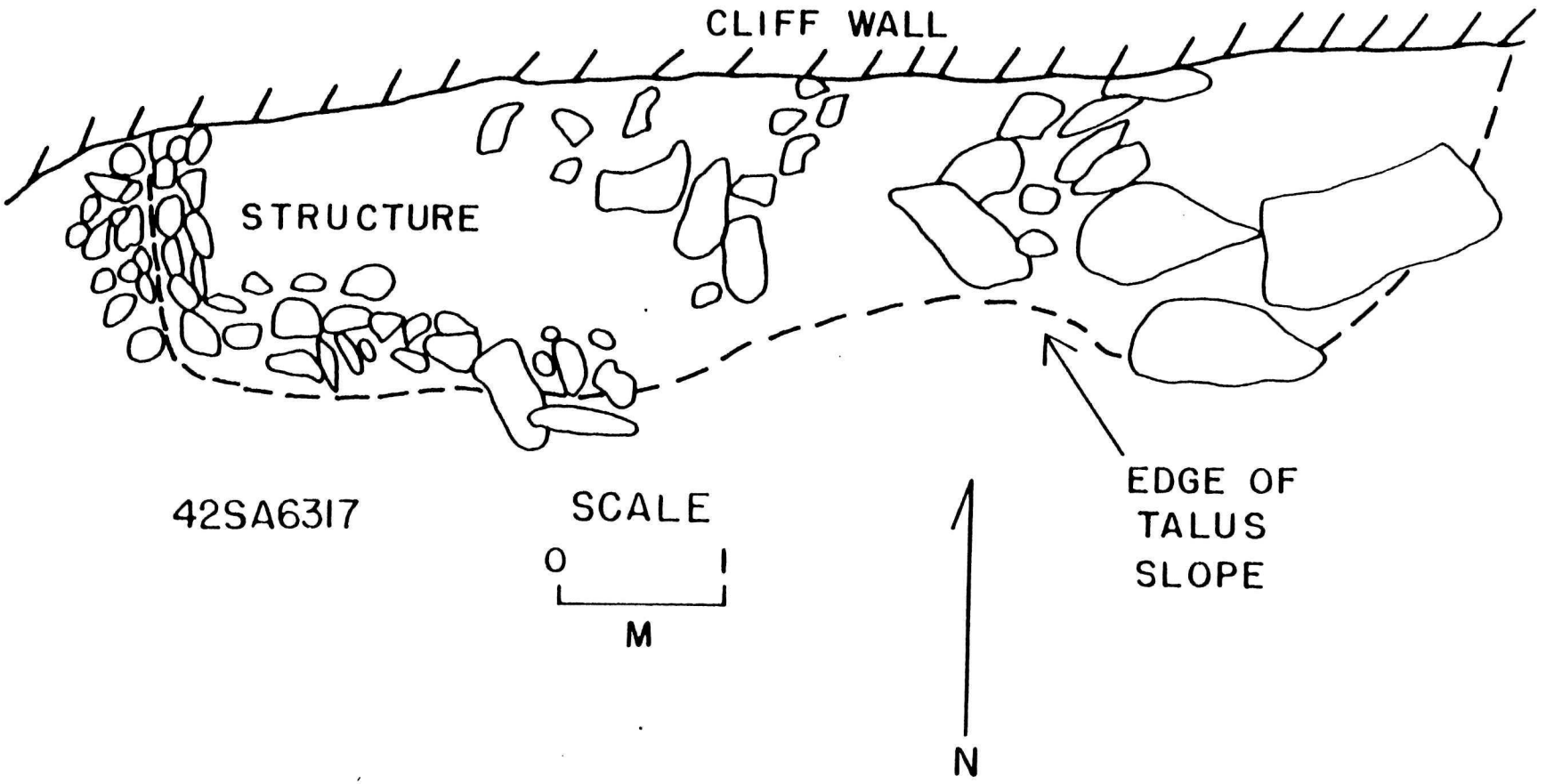


Figure 57. Planimetric map of 42SA6317

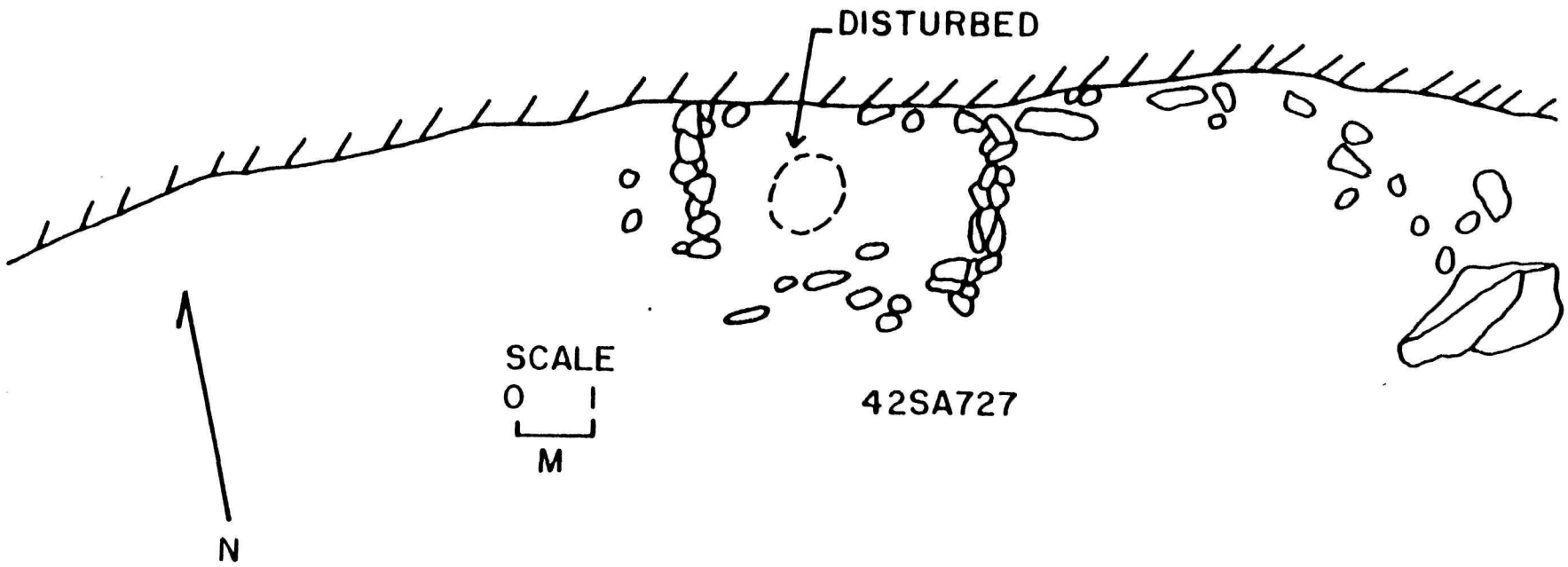


Figure 58. Planimetric map of 42SA727

42SA6215

This open site is an oval masonry structure on a bench of Kayenta sandstone on the right bank of Moqui Canyon about 2.5 km. upstream from the junction of North Gulch and the mainstem. It is about 300 m. downstream from, and on the same sandstone bench as, the Over Site (42SA6214). The structure is 2 m. N-S and 3 m. E-W, dry-laid construction with undressed sandstone slabs (Fig. 59). No more than three to five courses of the wall remain (maximum of 60 cm. high).

The northern third of the structure was tested. A plastered clay floor was encountered 30 cm. below ground surface, there were no floor features. Only two unidentifiable sherds were noted. Along the southern edge of the structure, a tabular piece of sandstone, with a small pecked depression in the center was found. This pecked slab is almost identical to the two similarly pecked slabs found at the Over Site just upstream. This site may be associated with the Over Site; it is probably a storage structure and dates from the same time period, late PII to early PIII.

The Over Site (42SA6214)

This site is located on a Kayenta Sandstone promontory overlooking the alluvial terrace on the right bank of Moqui Canyon about 2.8 km. upstream from North Gulch (Fig. 60, Table 9). The site consists of three contiguous rooms covering an area of about 24 m. N-S and 20 m. E-W on a sandstone ledge about 90 m. below the canyon rim (Fig. 61). To the NE of the site about 60 m. in a small alcove is a permanent seep. Two of the three structures are wet-laid; the mortar was still visible in the buried portions of the walls of Rooms 2 and 3. Room 1 and the exposed wall portions of Rooms 2 and 3 have no mortar among the unshaped slabs and blocks of sandstone used in construction.

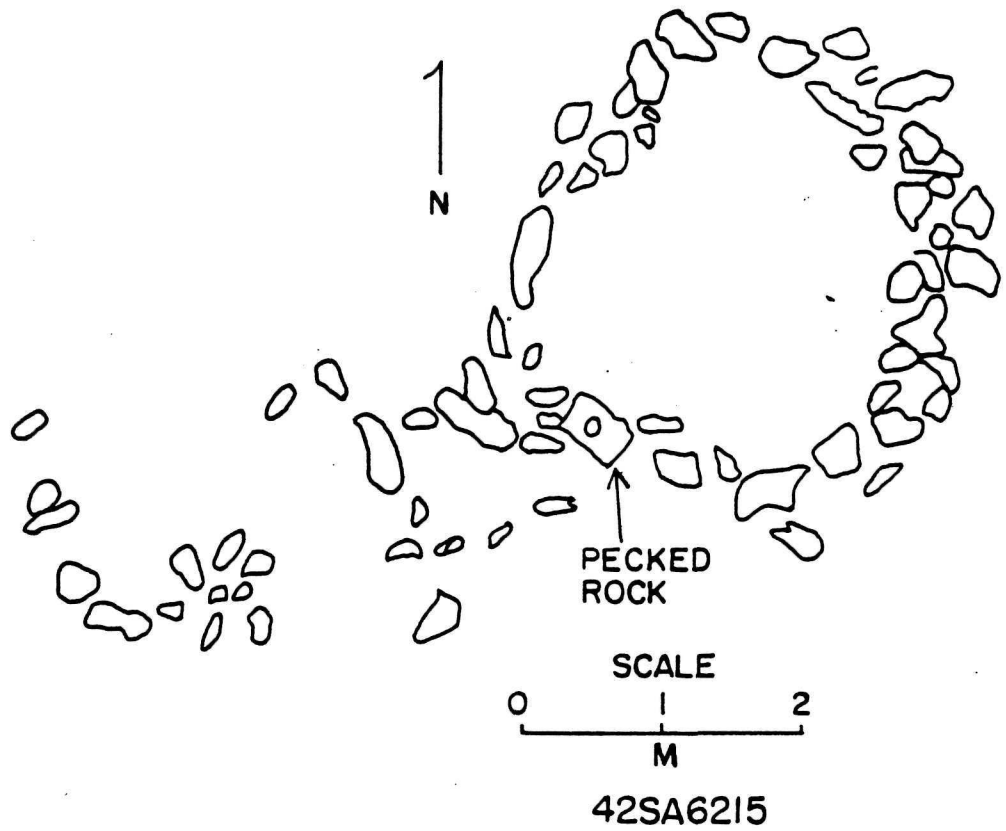
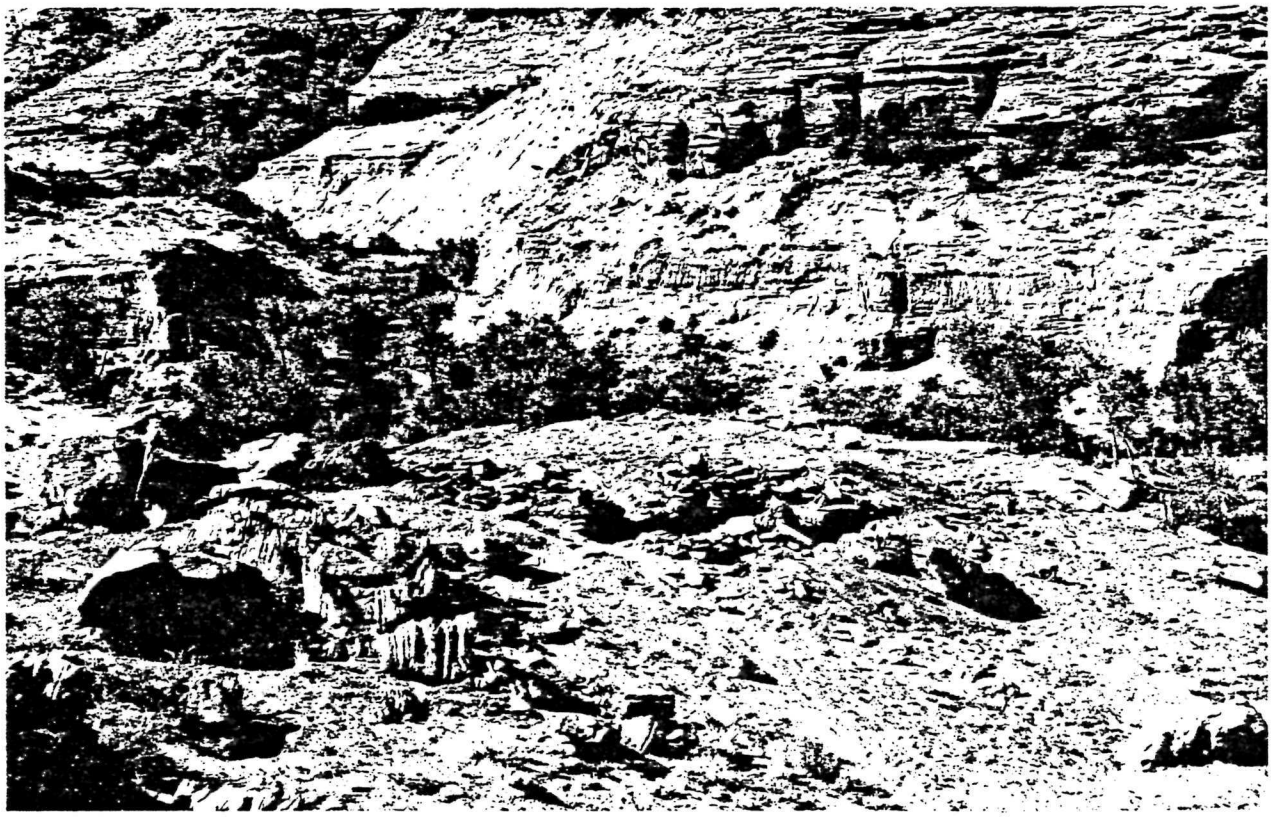


Figure 59. Planimetric map of 42SA6215

Figure 60. The Over Site (42SA6214) overlooking canyon floor.



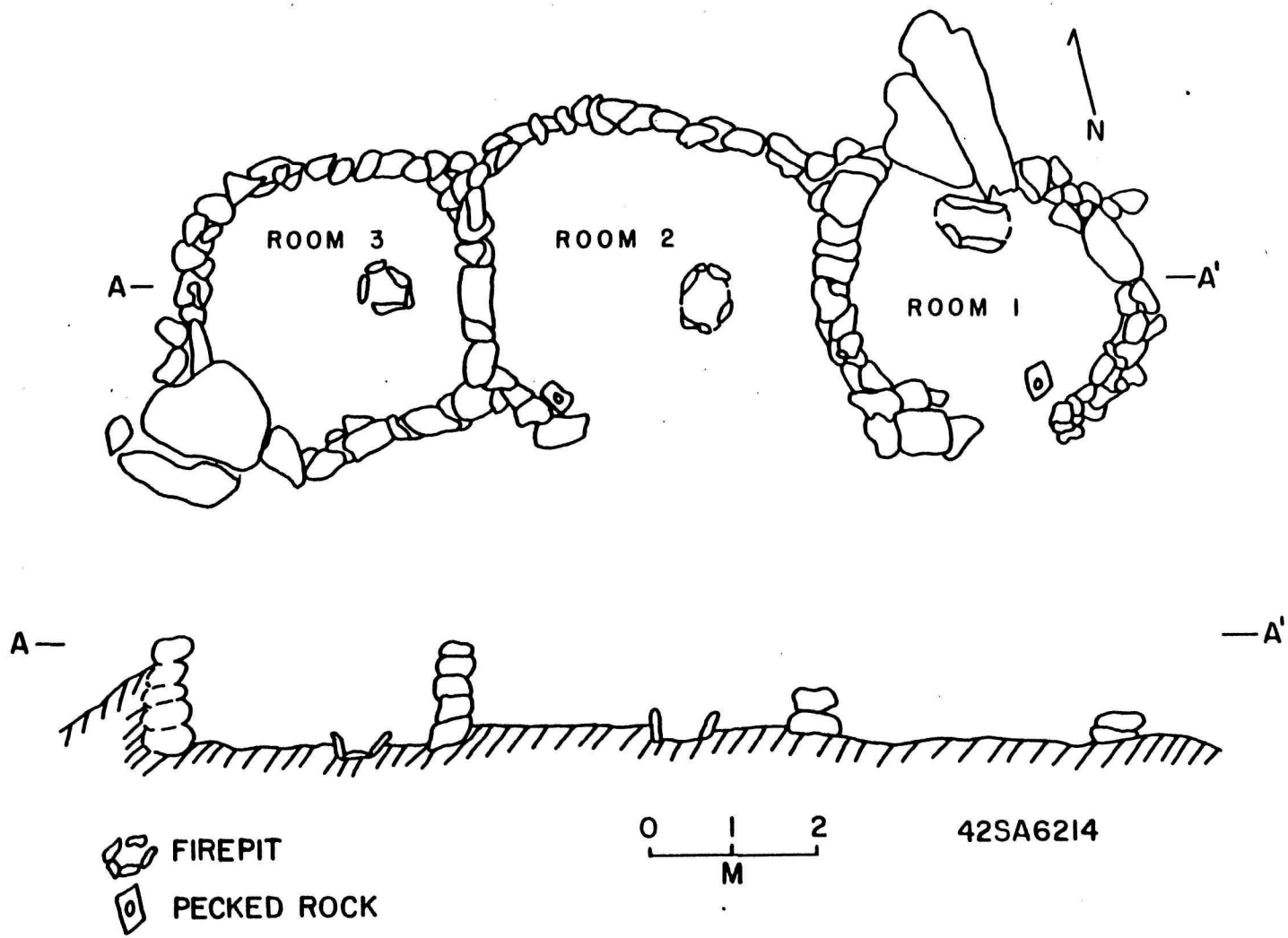


Figure 61. Planimetric map and cross section of the Over Site (42SA6214)

Table 9

Plant Communities in the Vicinity of the Over Site
(42SA6214)

Seeps and Spring Community

COMPOSITAE (Sunflower family)

Sonchus sp. (sowthistle)

POLYPODIACEAE (fern family)

*Adiantum Capillus-veneris L. (southern maidenhair)

Streamside (10 species)

CYPERACEAE (sedge family)

Carex lanuginosa Michx. (wooley sedge)

Scirpus sp. (bulrush)

COMPOSITAE (sunflower family)

Sonchus sp. (sowthistle)

EQUISETACEAE (horsetail family)

Equisetum laevigatum A. Br. (smooth horsetail)

JUNCACEAE (rush family)

Juncus balticus L.

POLEMONIACEAE (phlox family)

Filia aggregata [Pursh] Spreng. (skyrocket gilia)

POLYPODIACEAE (fern family)

Adiantum Capillus-veneris L. (southern maidenhair)

SALICACEAE (willow family)

Populus fremontii S. Wats. (Fremont poplar)

*Salis exigua Nutt. (coyote willow)

TYPHACEAE (cattail family)

Typha sp. (cattail)

Terrace (17 species)

CACTACEAE (cactus family)

Mamillaria cf. tetrancistra Engelm. (mamillaria)

Opuntia cf. compressa (pricklypear cactus)

CHENOPODIACEAE (goosefoot family)

*Atriplex canescens [Pursh] Nutt. (fourwing saltbush)

COMPOSITAE (sunflower family)

Artemisia filifolia Torr. (sand sagebrush)

A. ludoviciana Nutt. (Louisiana sagewort)

*Chrysothamnus nauseosus [Pall.] Britton (rubber rabbitbrush)

*C. viscidiflorus [Hook] Nutt. (Douglas rabbitbrush)

Gutierrezia microcephala [D.C.] A. Gray Xanthocephalum l.

(threadleaf snakeweed)

FAGACEAE (Beech family)

Quercus gambellii Nutt. (Gambell oak)

GRAMINEAE (grass family)

Oryzopsis hymenoides [Roem & Schult.] Ricker (Indian ricegrass)

Sporobolus cryptandrus [Torr.] A. Gray (sand dropseed)

Tridens pulchellus H.B.K. (fluff grass)

LEGUMINOSAE (pea family)

Astragalus cf. lentiginosus Dougl. (freckled milkvetch)

POLEMONIACEAE (phlox family)

Gilia aggregata [Pursh] Spreng. (skyrocket gilia)

POLYGONACEAE (buckwheat family)

Eriogonum inflatum Torr. & Frem. (desert trumpet)

SALICACEAE (willow family)

Populus fremontii S. Wats. (Fremont poplar)

ULMACEAE (elm family)

Celtis reticulata Torr. (netleaf hackberry)

Hillside (10 species)

CHENOPODIACEAE (goosefoot family)

*Atriplex sp. (saltbush)

COMPOSITAE (sunflower family)

Gutierrezia microcephala [D.C.] A. Gray Xanthocephalum l.

(threadleaf snakeweed)

EPHEDRACEAE (ephedra family)

Ephedra nevadensis S. Wats. (Nevada mormon tea)

GRAMINEAE (grass family)

Oryzopsis hymenoides [Roem & Schult.] Ricker (Indian ricegrass)

Sporobolus cryptandrus [Torr.] A. Gray (sand dropseed)

Tridens pulchellus H.B.K. (fluff grass)

LEGUMINOSAE (pea family)

Astragalus cf. lentiginosus Dougl. (freckled milkvetch)

POLEMONIACEAE (phlox family)

Gilia aggregata [Pursh] Spreng. (skyrocket gilia)

POLYGONACEAE (buckwheat family)

Eriogonum inflatum Torr. & Frem. (desert trumpet)

ULMACEAE (elm family)

Celtis reticulata Torr.

The talus material on the ledge was apparently leveled before the rooms were constructed. The south-facing walls were exposed while the back masonry walls of Rooms 2 and 3 (the north walls) were actually facing a shallow pit that had been dug into the underlying hardpan to a depth of 75 cm.

ROOM 1

Room 1, a circular room measuring appx. 5.2 m. N-S and 4.2 m. E-W, is the easternmost of the three in the structure (Fig. 62). The slab wall has 2-7 dry-laid courses remaining with heights ranging from appx. 40 cm. on the eastern side to appx. 75 cm. on the west and with widths varying from appx. 47 cm. on the west wall of appx. 67 cm. on the east. The northern portion of the wall is constructed around a naturally occurring sandstone boulder that is spalling flat tabular slabs. The boulder is about 2.5 m. long and forms part of the wall across its width for 2 m. A smaller boulder about one meter across forms part of the eastern portion of the wall. Very little wall fall was noted either inside or outside of the enclosure and the original height of the walls was probably not more than 1 m. It is possible that Room 3 was constructed later and that slabs from the wall in this room were pirated for construction of Room 3. There was a 75 cm. break in the wall on the south side, whether this was a purposeful opening or occurred post-occupation is unknown (no wall fall was noted). No evidence of a prepared entryway or ventilator system was noted.

The only floor feature noted on the use-packed surface was a rectangular, slab-lined firepit located just south of the large boulder. The firepit was 10 cm. deep and measured 50 cm. N-S and 65 cm. E-W; vertical slabs of sandstone rimmed the north and south sides of the hearth, while a slab on the east side was banked with clay. A single horizontal slab lined the bottom of the pit. Patches of fire-reddened sand were noted in the bottom of the pit; the fill consisted of loose light-gray, ashy material.

Figure 62. Room 1, Over Site, (42SA6214).

A single, dressed, trapezoidal, sandstone slab, 7 cm. thick, 37 cm. long, and 30 cm. wide, was found just inside the room near the eastern edge of the opening in the wall. In the approximate center of the slab a slight circular depression had been purposefully pecked; it is 2 cm. deep and 4 cm. in diameter (Fig. 63). The function of this object is uncertain. The depression shows no evidence of heavy use (i.e. abrasion and crushing marks) which might be expected if it was used as a mortar stone. The object is apparently complete and finished since a similar one was found in Room 2 and at 42SA6215, a small site 300 m. further downstream.

ROOM 2

Room 2, with interior dimensions of appx. 6.15 m. N-S and 3.7 m. EW, is rectangular (Fig. 64). The eastern wall is shared with Room 1, the western wall with Room 3, and the walls have courses varying from four on the east that are 75 cm. high to eight courses at 1.25 m. in height on the west. They vary in thickness from appx. 60 cm. on the east to 76 cm. on the west. An opening in the south wall measuring appx. 3.5 m. E-W is probably due to wall fall since no evidence of a door or a ventilator system was found.

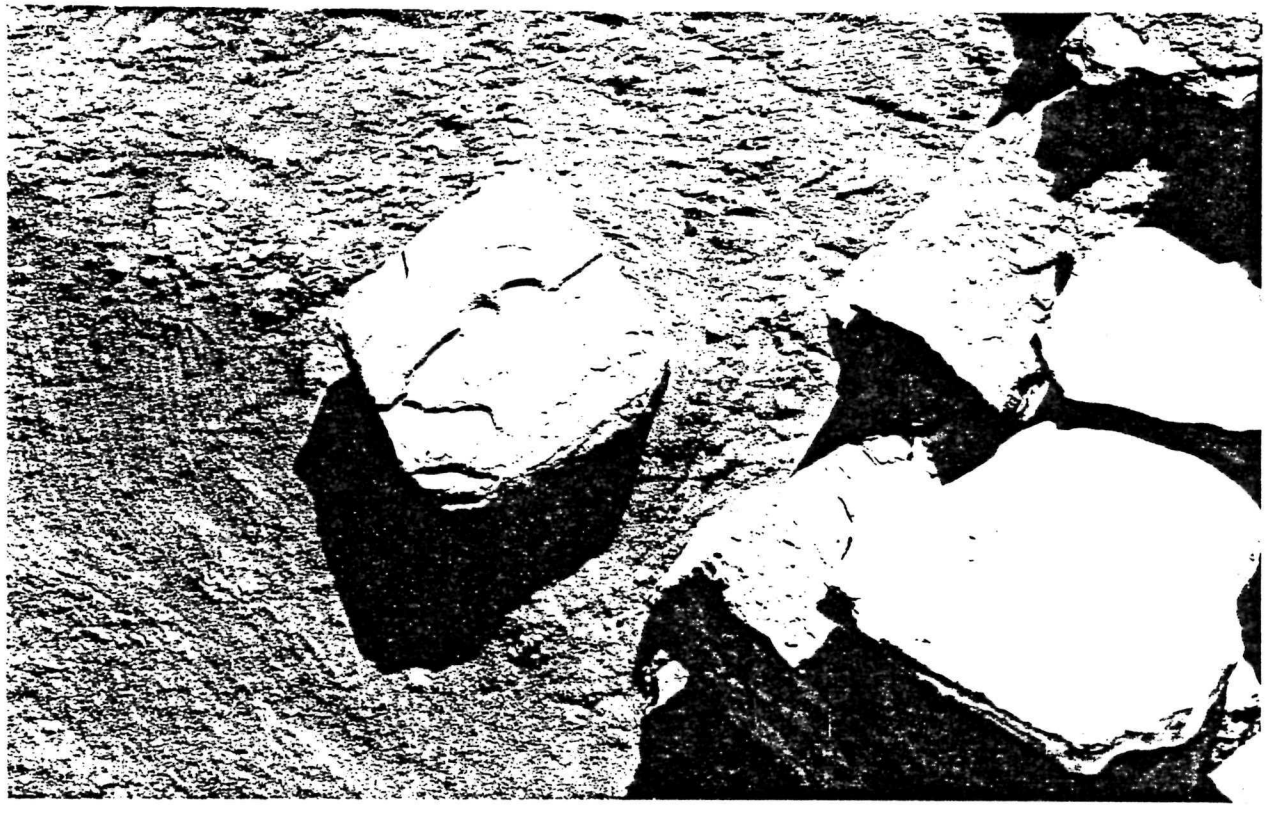
An oval, slab-lined hearth measuring 84 cm. N-S, 61 cm. E-W, and 8-10 cm. deep is located just east of the center of the room. Seven vertical sandstone slabs line the hearth on three sides. There was no horizontal slab on the floor of the firepit. The fill consisted of fine sand containing organic material, charcoal pieces, and gray ash.

Two postholes measuring appx. 15 cm. in diameter are located on an E-W axis NW of the hearth in the floor of Room 2. The floor has a hard-packed, used surface with no evidence of clay plaster.

A rectangular sandstone slab measuring 28 cm. by 37 cm. and 8 cm. thick, with a pecked depression was found on the floor surface near the southern

Figure 63. Slab with pecked depression, Room 1, the Over Site.

Figure 64. Room 2, Over Site (42SA6214).



opening in the wall. It is almost identical to the slab found in Room 1. The small depression, centrally located, is 5 cm. in diameter and appx. 2 cm. deep.

ROOM 3

Room 3 is D-shaped, encloses a 4.5 m. N-S and 4 m. E-W area and has an eastern wall in common with the west wall of Room 2 (Fig. 65). The north and west walls form an arc starting at the NE corner of the room and continuing to the SW corner where it abutts a large naturally occurring, sandstone boulder. The south wall begins to the east of this boulder and joins the eastern wall. Courses remaining vary from 15 on the west wall that are 2 m. in height and appx. 75 cm. thick to nine on the eastern wall that is 1.25 m. high and appx. 35 cm. thick.

The floor surface of the room has a discontinuous layer of white clay plaster appx. 3 cm. thick and is coved at the north and east walls. The south and west walls were probably similarly prepared.

A trapezoidal, vertical, slab-lined hearth was noted along the medial axis in the eastern portion of the room (Fig. 66). The firepit is 10 cm. deep and measures 49 cm. N-S and 40 cm. E-W. Several sandstone slabs outline the edge of the pit with floor plaster banked up around these slabs. A single broken slab was found lining the floor of the hearth. The fill of the firepit was a light-gray, ashy material with some unconsolidated pieces of fire-reddened clay.

Four postholes were noted which range between 10 and 12 cm. in diameter and averaged about 6 cm. deep and were all banked with floor plaster. Three of them were found on an E-W axis about 30 cm. north of the hearth. The fourth was found in the southeastern quadrant of the structure. Twenty cm. to the west of the last posthole in the alignment was a single pit measuring 25 cm. deep and 29 cm. in diameter. This pit was probably a storage pit since it was not plastered.

Figure 65. Interior of Room 3, the Over Site (42SA6214).

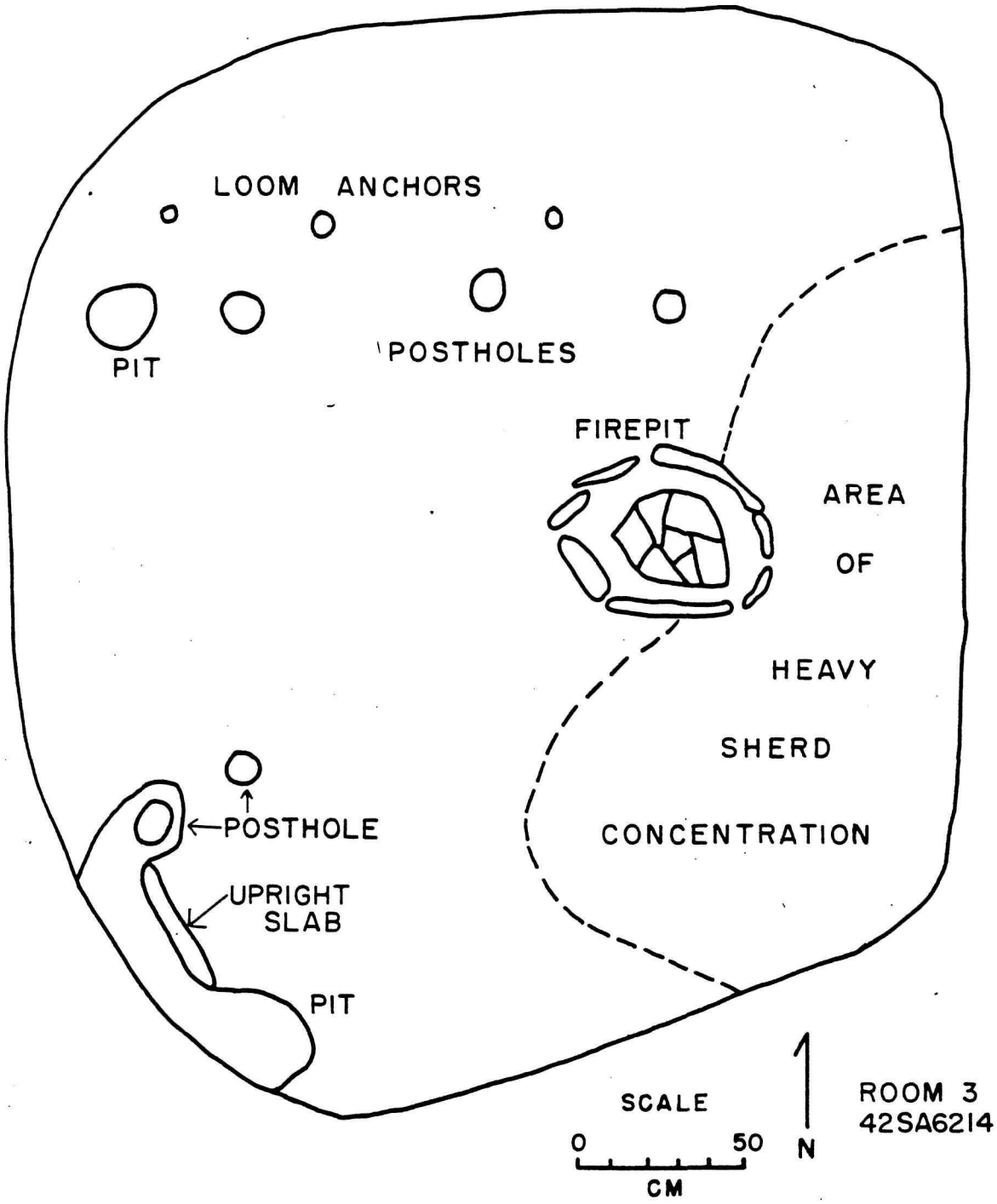


Figure 66. Planimetric map of Room 3, the Over Site (42SA6214)

A series of three smaller holes were found on an E-W axis that parallels, to the north, the posthole alignment. These three holes were all about 7 cm. in diameter and 5 cm. deep and they were plastered. Although nothing was found in them, these three holes probably functioned as loom anchor holes.

In the SW corner of the room abutting the wall an elongated, C-shaped pit was observed. The hole curves around an upright sandstone slab. The pit is 90 cm. long and varies between 20 and 34 cm. in width. The clay plastered hole had an average depth of about 13 cm. On the northwestern end of the pit there was a smaller, deeper hole measuring 32 cm. deep and 15 cm. in diameter. This smaller hole probably functioned as a post hole. However, the function of the whole cultural feature is unknown.

42SA677

Site 42SA677 consists of a single rectangular masonry structure measuring appx. 3 m. N-S and 3.25 m. E-W which occupies a sandstone ledge on a cliff face (Fig. 67). The site is located on the right bank of Moqui Canyon appx. 13 km. from the canyon mouth. The eastern wall, with a height of appx. 80 cm., a thickness of appx. 40 cm., and constructed with sandstone slabs and small chinking stones, has some mortar remaining near the base. A partial wall measuring appx. 25 cm. in height and 35 cm. in thickness remains on the west with no visible mortar. No wall exists on the south. About two-thirds of the interior portion of the structure has been dug out by looters. They probably penetrated the floor surface in most of the structure. It is doubtful if any useful archeological information still remains at this site. When the site was first recorded in 1960, there was no evidence of looting and portable artifacts and pot sherds were scattered around the site. In 1977, there were no portable artifacts at this site.

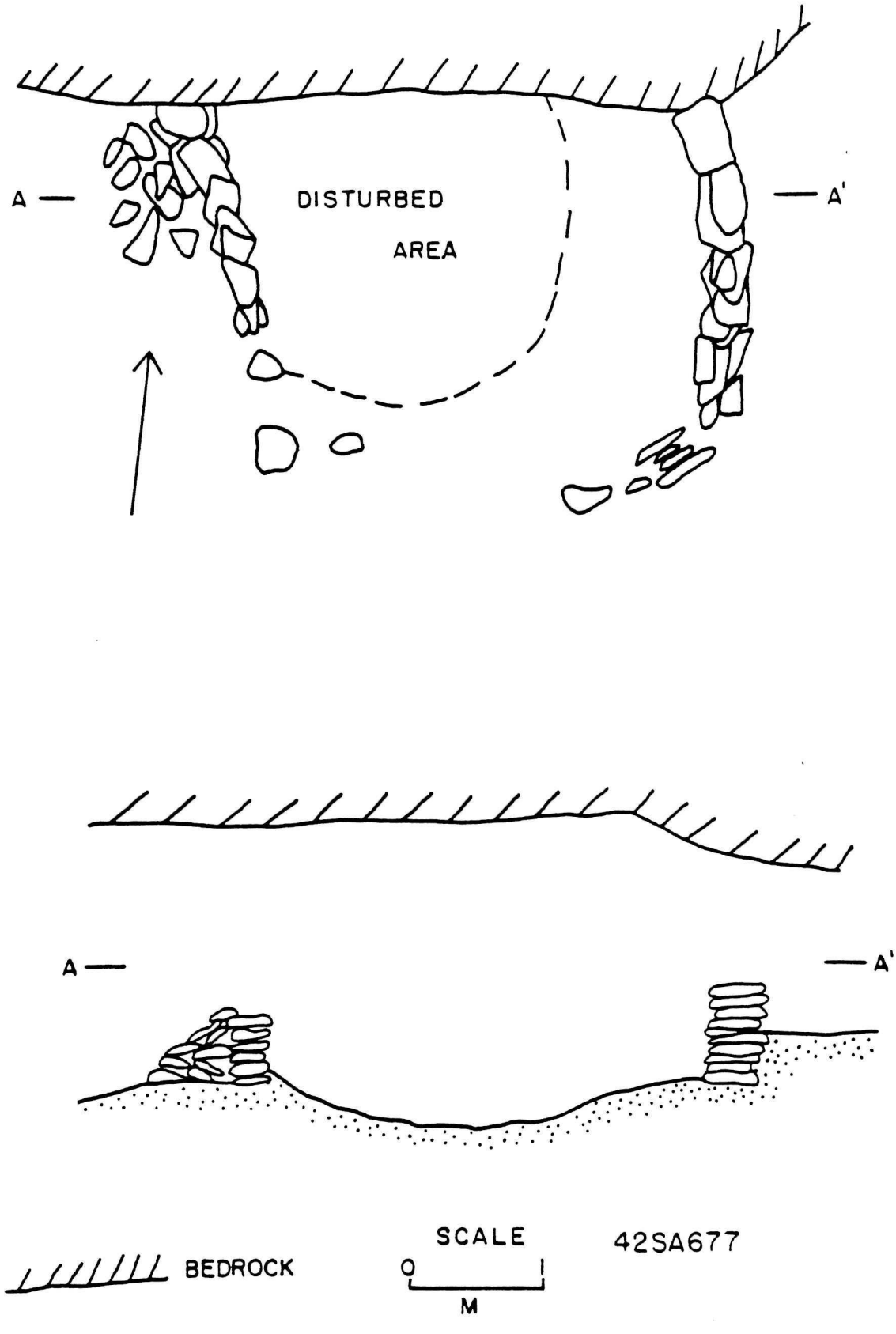


Figure 67. Planimetric map of 42SA677

42SA740

Site 42SA740 consists of six masonry structures on a sloping SW facing ledge (Fig. 68), two midden areas (one on a terrace below the six structures) and a third lower level terrace containing the remains of a single rectangular structure. The only work done at this site was the mapping of the structures and the collecting of the surface artifacts.

The site is located on the right bank of Moqui Canyon appx. 3 km. east of the mouth of North Gulch. The walls of the six structures on the upper ledge are dry-laid, sandstone boulder, masonry constructed with at least three different types of sandstone. None of the structures were excavated or tested.

Structure 1 is semi-circular, abutting a large sandstone boulder and measures appx. 5.5 m. N-S and 4.6 m. E-W. The wall is constructed with yellow and maroon sandstones with the basal course intact. The north portion of the wall has 5-6 courses of masonry remaining but the eastern and southern portions have fallen.

Structure 2, with two circular contiguous rooms, measuring appx. 10 m. N-S and 6.8 m. E-W, is located appx. 2 m. east of Structure 1 on the eastern edge of the ledge. The yellow and maroon sandstone walls have 6-7 courses of masonry remaining on the east side and 3-4 courses on the SW side.

Structure 3 is semi-circular, measures appx. 4.8 m. N-S and 3.2 m. E-W, and has only 1-2 courses of light-gray sandstone masonry intact.

Structure 4 is semi-circular, has measurements of appx. 5.5 m. N-S and 6.1 m. E-W, and the maroon and light-gray sandstone slab wall is basically in good repair with 6-7 courses remaining.

Structure 5 shares a south wall with the north wall of Structure 6. Both structures are rectangular with walls of maroon sandstone, Structure 5 measuring 2.9 m. N-S and 3.2 m. E-W and Structure 6 having dimensions of 5.8 m. N-S and 4.6 m. E-W.

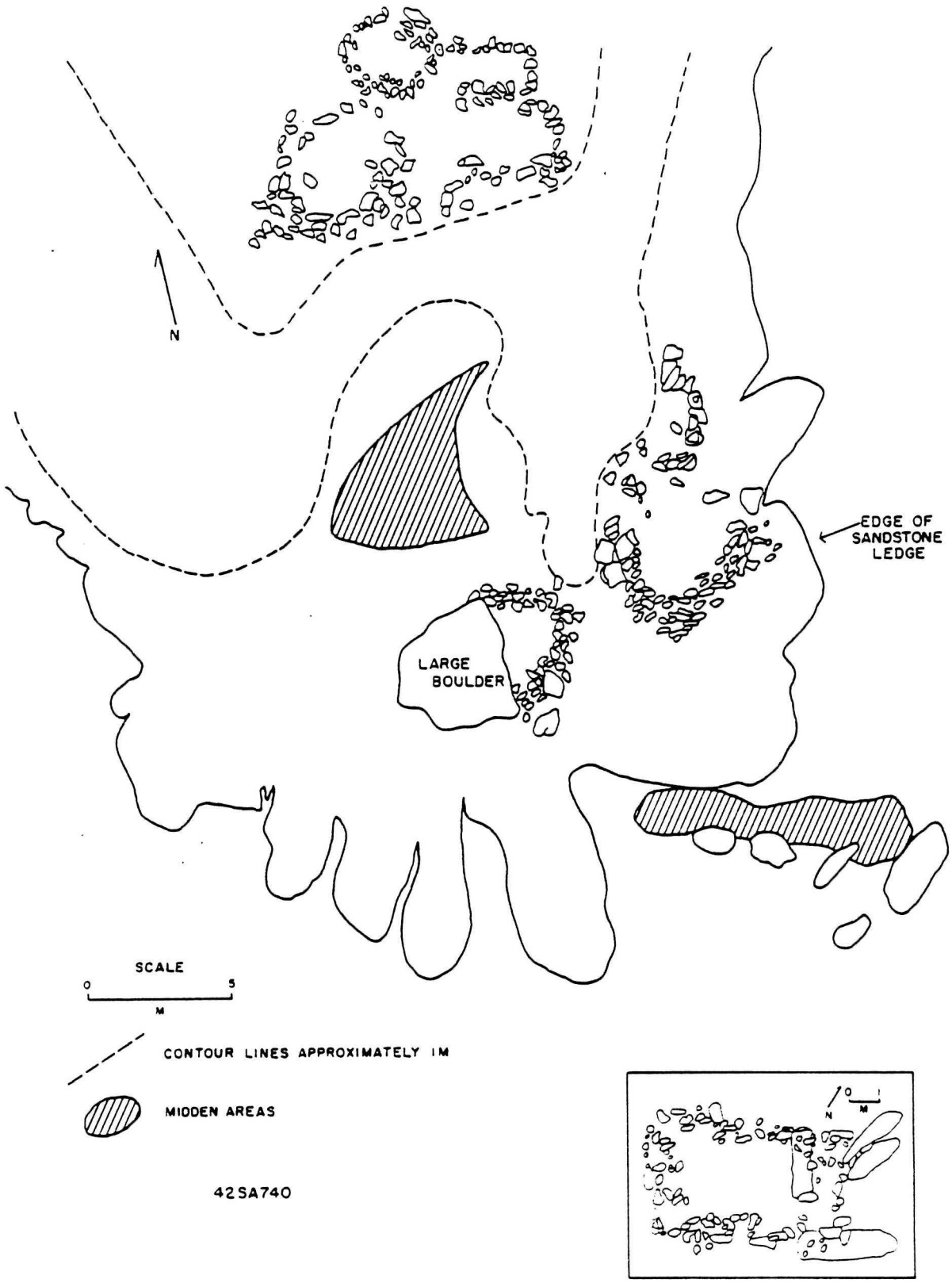


Figure 68. Planimetric map of 42SA740

On the lowest terrace just above the alluvial there is a seventh structure, a single course of masonry outlined a rectangular structure about 3 m. by 5 m.

One small midden area was noted on the top ledge with all the structures and another much more extensive midden area was noted on the next terrace down to the south of the structures. This lower midden, according to the original survey notes, had a small circular structure associated with it. In 1977 this structure could not be located. It was probably destroyed by looters since this midden had been completely dug up, pottery, bone and stone fragments were found scattered around the area.

ROCK ART IN MOQUI CANYON

by

Lynne Sebastian

Introduction

With the possible exception of house structures, no class of archeological remains is so visually striking and immediately intriguing as rock art. Yet with the probable exception of artifacts removed from context and brought in by well-meaning laymen, no class of archeological remains is of so little practical use to the archeologist. Even where rock art sites occur in close association with structures or camp sites, no absolute relationship between the inhabitants of the structure or camp and the prehistoric artist can be proved. Deeply stratified sites have the added complication of unprovable relationships not only of art panel with site but of art panel with any particular occupation. And many, perhaps most, rock art sites do not occur even close to habitation sites. Establishing affiliation of rock art sites with any other archeological remains is virtually impossible except in such specialized cases as art which depicts pottery or blanket designs, recognizable kachinas, or specific figurine elements.

Even where cultural affiliation can be established with some degree of certainty, chronological relationships are impossible to ascertain. Rock art is not amenable to the stratigraphic methods used for relative dating of other materials; no chemical or physical dating techniques like radiocarbon analysis or dendrochronology can be applied to rock art, although studies of possible chemical analyses are in progress. The few dating techniques usable for these sites (e.g., degree of patination and weathering, superposition) are extremely relative, often unreliable, and do not permit cross-dating with other archeological remains.

It is only in the area of geographical relationships that rock art sites have been of use to the archeologist so far. As interest in such systemic and geographically wide-spread aspects of prehistoric life as settlement patterns and annual-round adaptations has increased, interest in the distribution and repetitive patterns of rock art has increased as well. Although rock art can rarely be tied absolutely to specific prehistoric groups or given absolute dates, there are definite, recognizable stylistic patterns that vary consistently through time and space. These patterns have already been used to an extent by archeologists; hopefully as techniques improve and need increases, they will be used more often and with greater success. For now the sites can only be carefully recorded in anticipation of the time when the need for the data now locked up in these panels will become strong enough to generate a method for unlocking them.

Many of the questions one would wish to answer about rock art--who created it? when? why? what does it "mean?"--are, given our current level of knowledge and technology, largely unanswerable. Turner (1963) has attempted to answer the *who?* and *when?* questions for the Glen Canyon area, but no similar systematic studies are available for most areas. Possible *whys* and *what it means* have been advanced by various professionals and amateurs—everything from "sympathetic hunting magic," to "hieroglyphic writing," to "art for art's sake." But the only facet of rock art that can be discussed with any certainty at this stage in our understanding is style—element inventories, degree of realism, motifs, patterns, and quality and technique of execution.

Rock Art Sites

42SA585 DOLL RUIN (Lipe et al. 1960) (Fig. 69, 70, 71)

Description

This site has an 80 m. panel of pictographs occurring in clusters along the rear alcove wall. Twelve anthropomorphic figures are represented, two of which

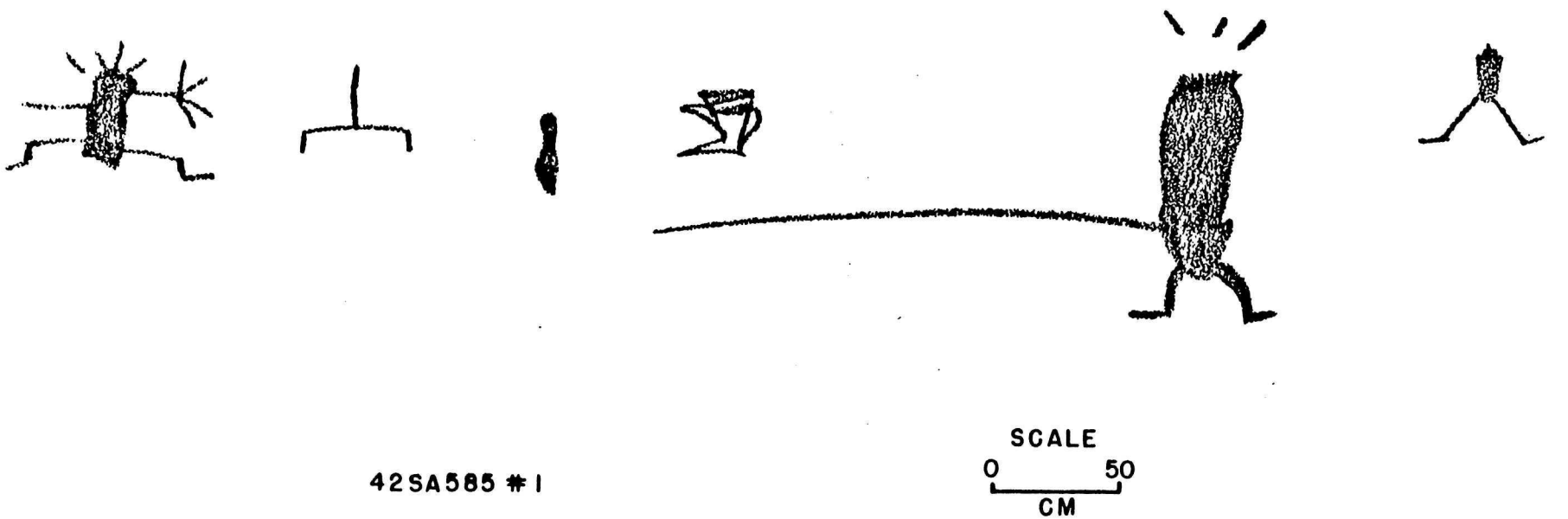


Figure 69. Rock art (42SA585 #1)

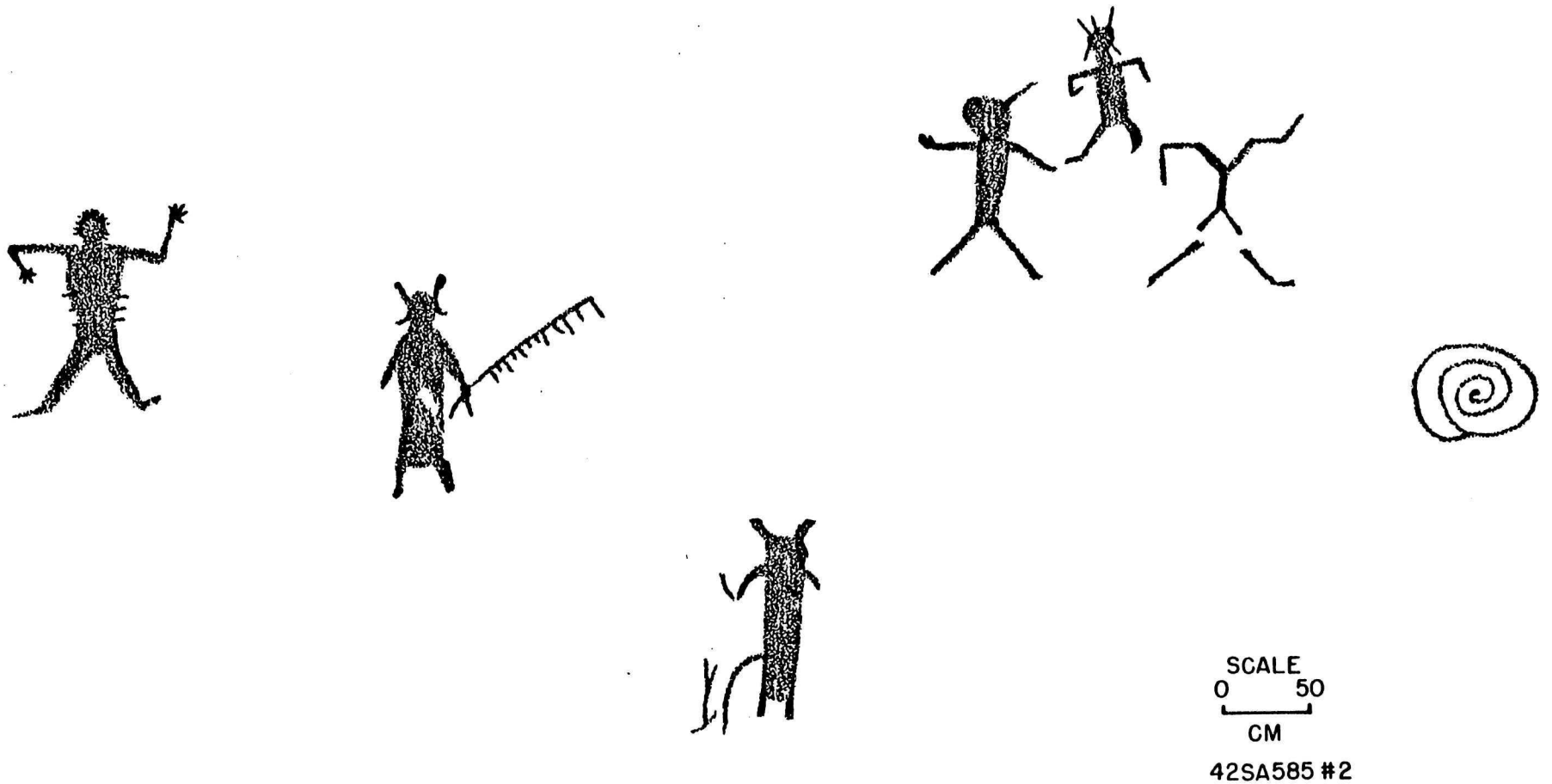


Figure 70. Rock art (42SA585 #2)

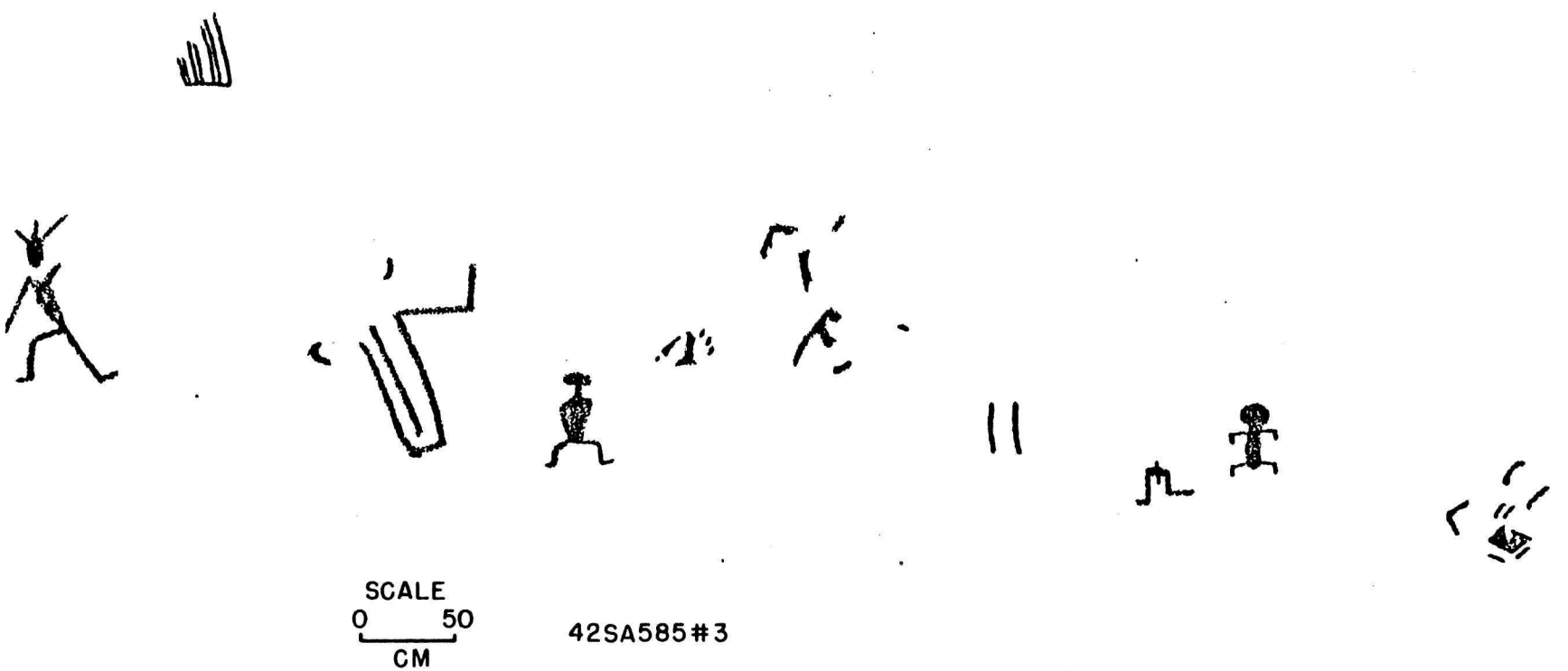


Figure 71. Rock art (42SA585 #3)

lack arms and heads and one of which lacks arms. The bodies of these anthropomorphs are generally rectangular to triangular; two of the figures have outstretched arms. Two of the other anthropomorphs have the arms that are out and down-curved. Hands are represented on two figures. Legs are generally straight down or angled out from the torso. Four figures have branching elements on the head, possibly representing headdresses. In addition to the anthropomorphs, several abstract elements and one spiral are represented.

Style

Glen Canyon Style 4.

42SA676 (Fig. 72)

Description

This small petroglyph panel contains a appx. 1 m. in diameter discontinuous spiral, two sets of dot-centered concentric circles, and a small probable anthropomorph with a round torso and a small head and extremities. But most of the figures are abstracts composed of small, carefully executed and arranged V-shaped elements forming what is probably a blanket or pottery pattern.

Style

The style is undeterminable; blanket patterns do occur in Glen Canyon Style 4.

42SA684 (Fig. 73, 74)

Description

This site consists of two panels of incised designs. The first panel consists of short, straight lines forming tick marks or bird tracks. Also included are two small, sunburst-type figures formed around small dots and connected to a thick central line. The second panel includes a rectangular-bodied anthropomorph with

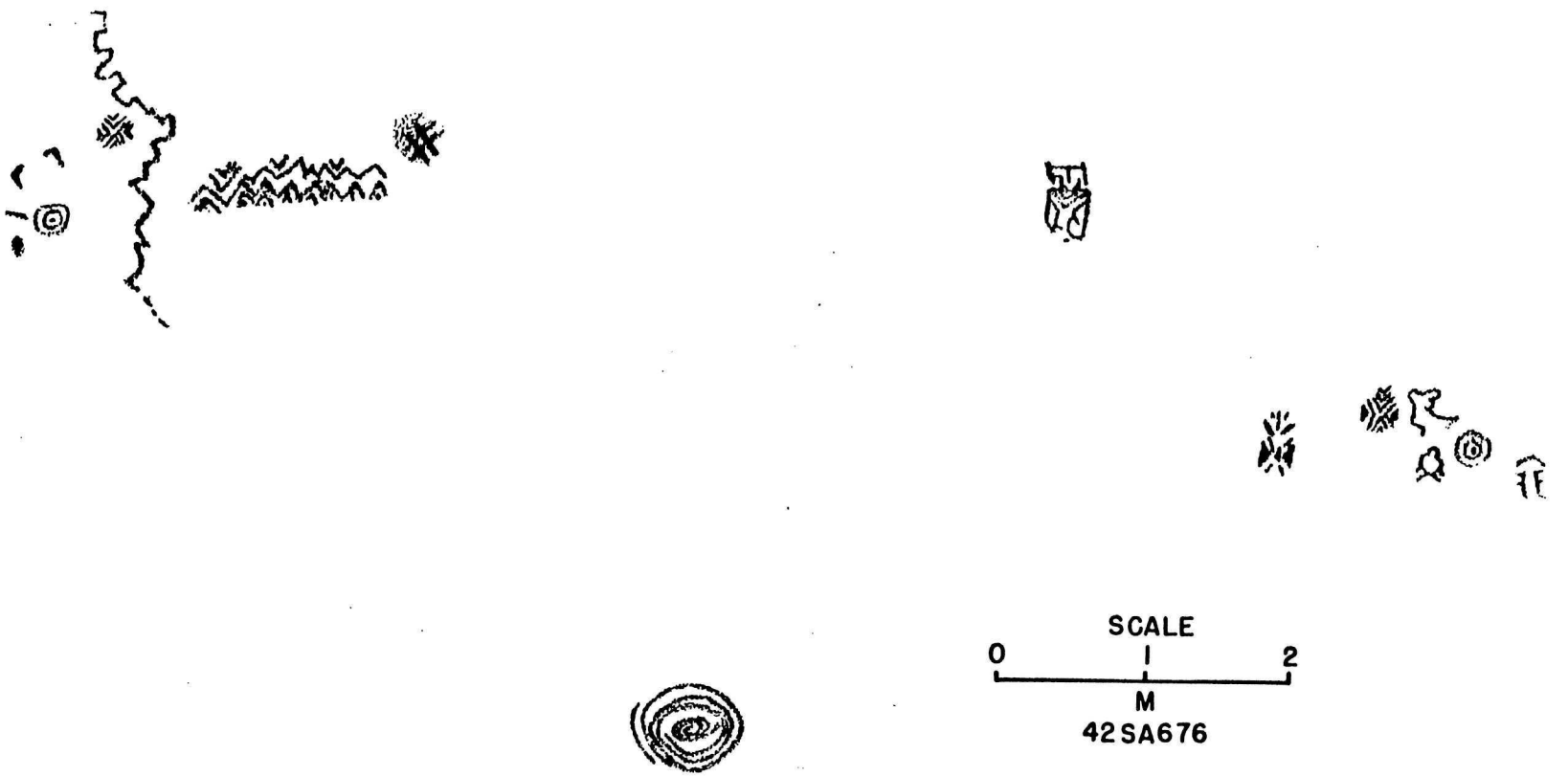


Figure 72. Rock art (42SA676)

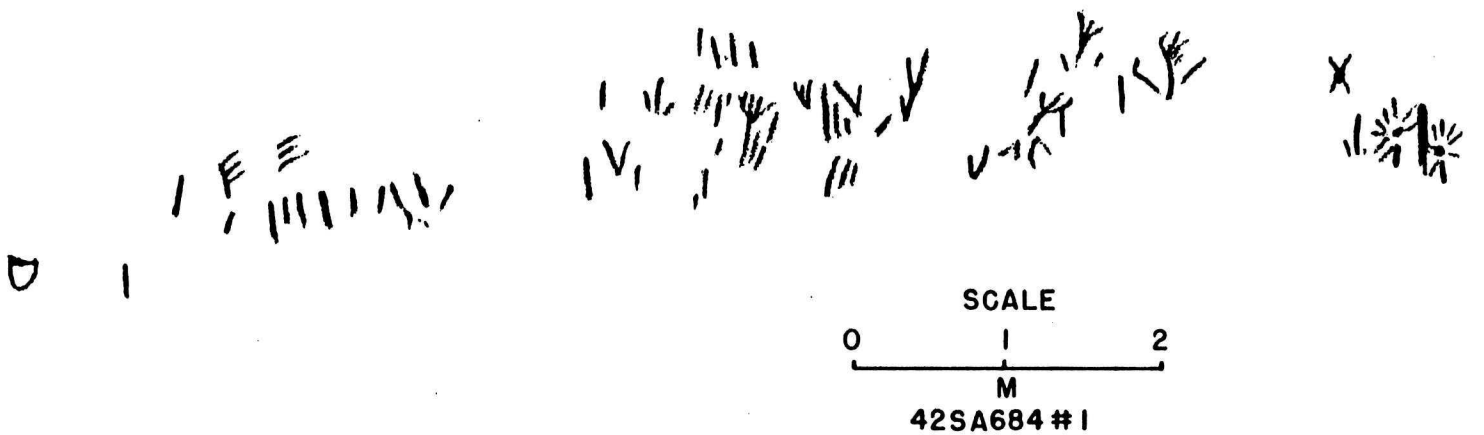


Figure 73. Rock art (42SA684 #1)

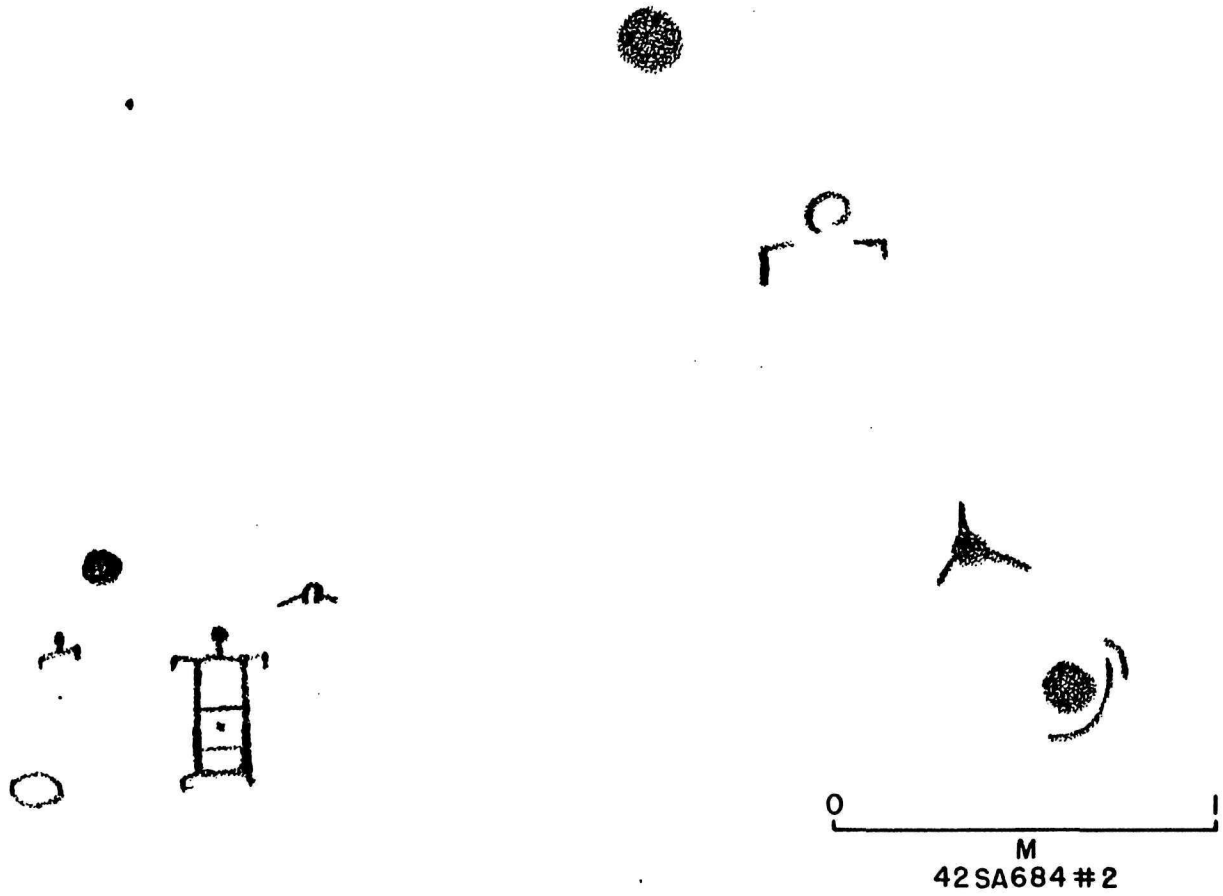


Figure 74. Rock art (42SA684 #2)

very small extremities, a long neck, a small head, and a sash motif. Also occurring on this panel are several large solid and outline dots, one with three outward projections, and a number of bracket and curve lines.

Style

The style is uncertain; the anthropomorph may indicate the Glen Canyon Style 4.

42SA685 (Fig. 75, 76, 77)

Description

This site consists of three panels comprising largely anthropomorphic figures and hand prints, both negative and positive. Although the anthropomorphs exhibit some individuality, all but two are very similar in overall style. Torsos are largely triangular, broad at the shoulder and narrowing toward the hips. Arms are outward and down-curving continuations from the shoulders; hands and feet, where they occur, are "bird track" style. Genitalia, where represented, are parallel single lines or zigzags. Heads are simple knobs without features or decoration. Indeed, only one figure shows any decoration, it has a sash motif and a possible breechcloth. This figure may also have eyes depicted. Two figures are shown with objects in or near their hands that could represent heads or masks, but this is only a tentative identification.

The two anthropomorphic figures that show stylistic differences from those in the rest of the panels are solid—the others are executed in outline only—and have squarish torsos and helmet-shaped heads. Both have arms that extend horizontally from the shoulders and turn down only at the wrists. One figure also has legs that extend horizontally from the body then turn downward at the knees, very like the famous Defiance House figure. Neither of these anthropomorphs exhibits decoration or has genitalia.

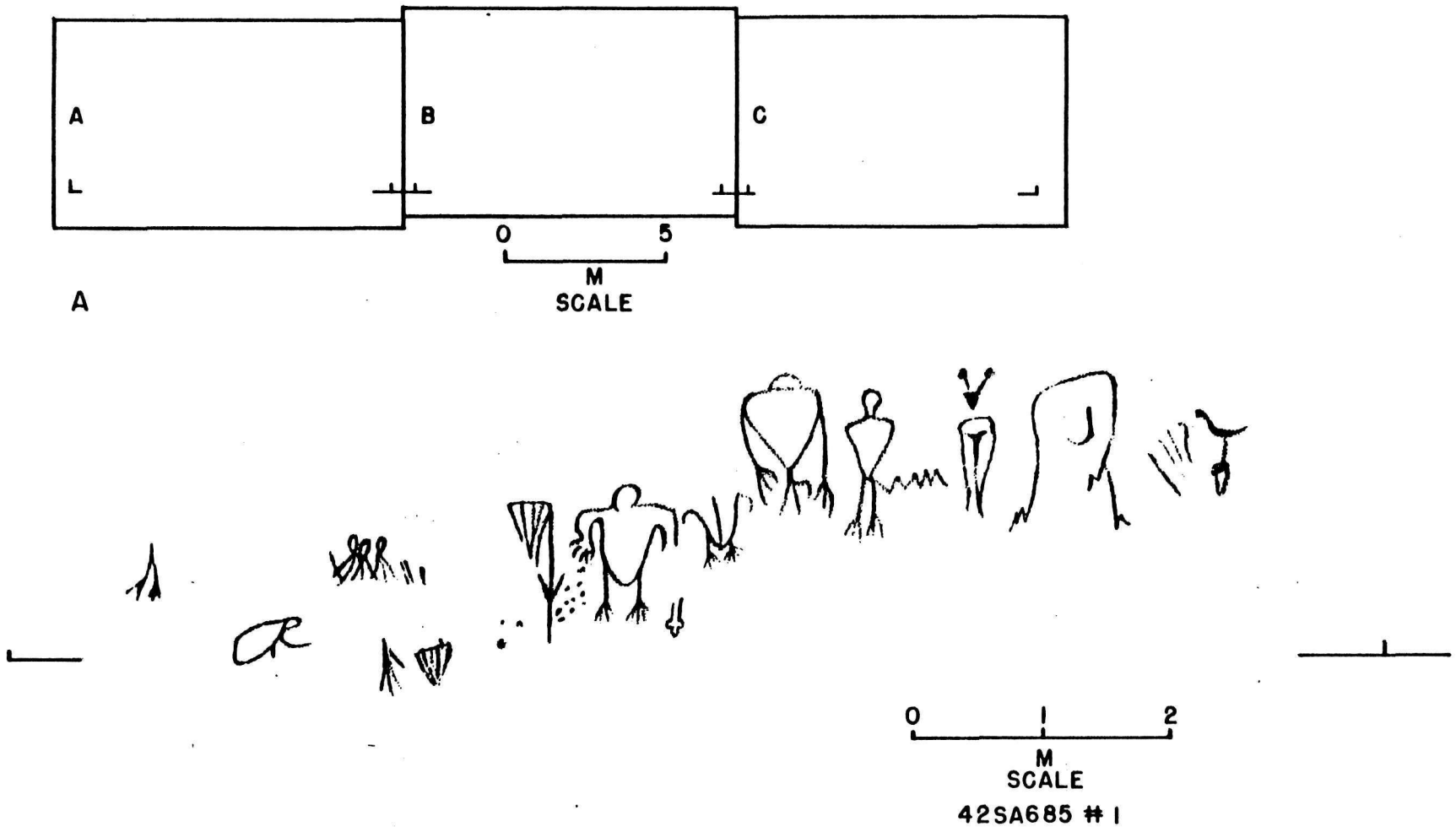


Figure 75. Rock art (42SA685 #1)

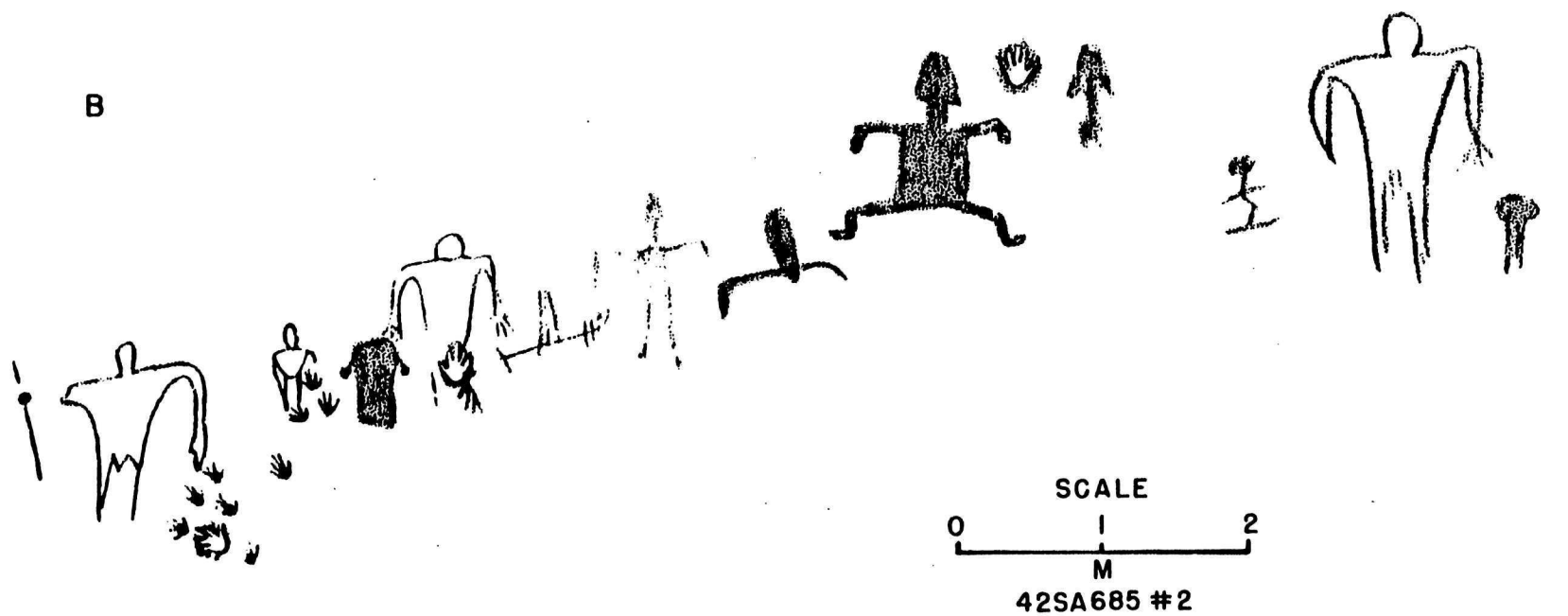


Figure 76. Rock art (42SA685 #2)

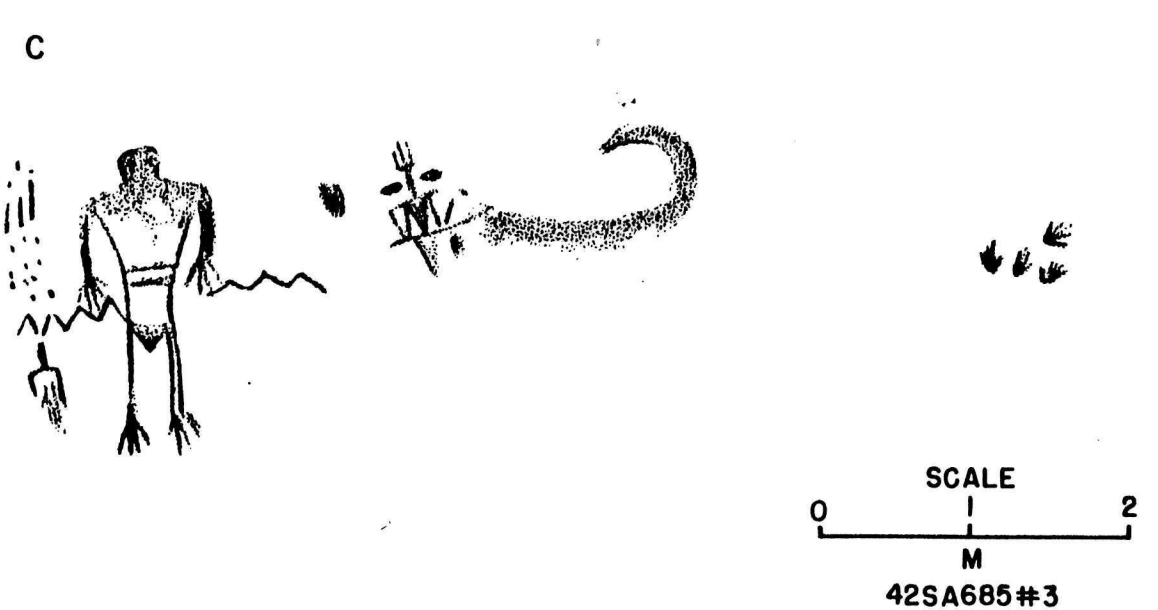


Figure 77. Rock art (42SA685 #3)

In addition to the anthropomorphs and numerous hand prints, the panels contain two horizontal zigzag lines (snakes?), several simple abstract figures, and one very complex abstract with both linear and curving elements.

Style

The style is Glen Canyon Style 4.

42SA736 BERNHEIMER ALCOVE (Sharrock et al. 1963) (Fig. 78-83)

Description

This large set of panels stretches for over 60 m. along the canyon wall and contains both painted and incised figures. Like site 42SA685, which this resembles in certain style elements, this large collection of figures consists almost entirely of anthropomorphs and hand prints; in this case, the hand prints are all positive.

The few non-anthropomorphic elements on these panels are largely curved or branching lines, triangles, half-moon shapes, and symmetrically curved shapes.

The anthropomorphs, though varying greatly in detail, are generally similar in overall design. They have the broad-shouldered, triangular torsos found throughout the study area and the common arm design wherein the extremities are outward and down-curving extensions from the shoulders. Hands are frequently represented, but feet are more rare; both hands and feet, where they do occur, are of the bird track style and slightly to greatly exaggerated. Sash motifs occur, and one figure (which also displays other differences from the rest of the anthropomorphs) has a fairly complex torso decoration of straight lines. Other than these, no torso decorations occur. Only one phallic representation occurs. One very small anthropomorph in panel D and one in panel E are depicted as horizontal rather than vertical.

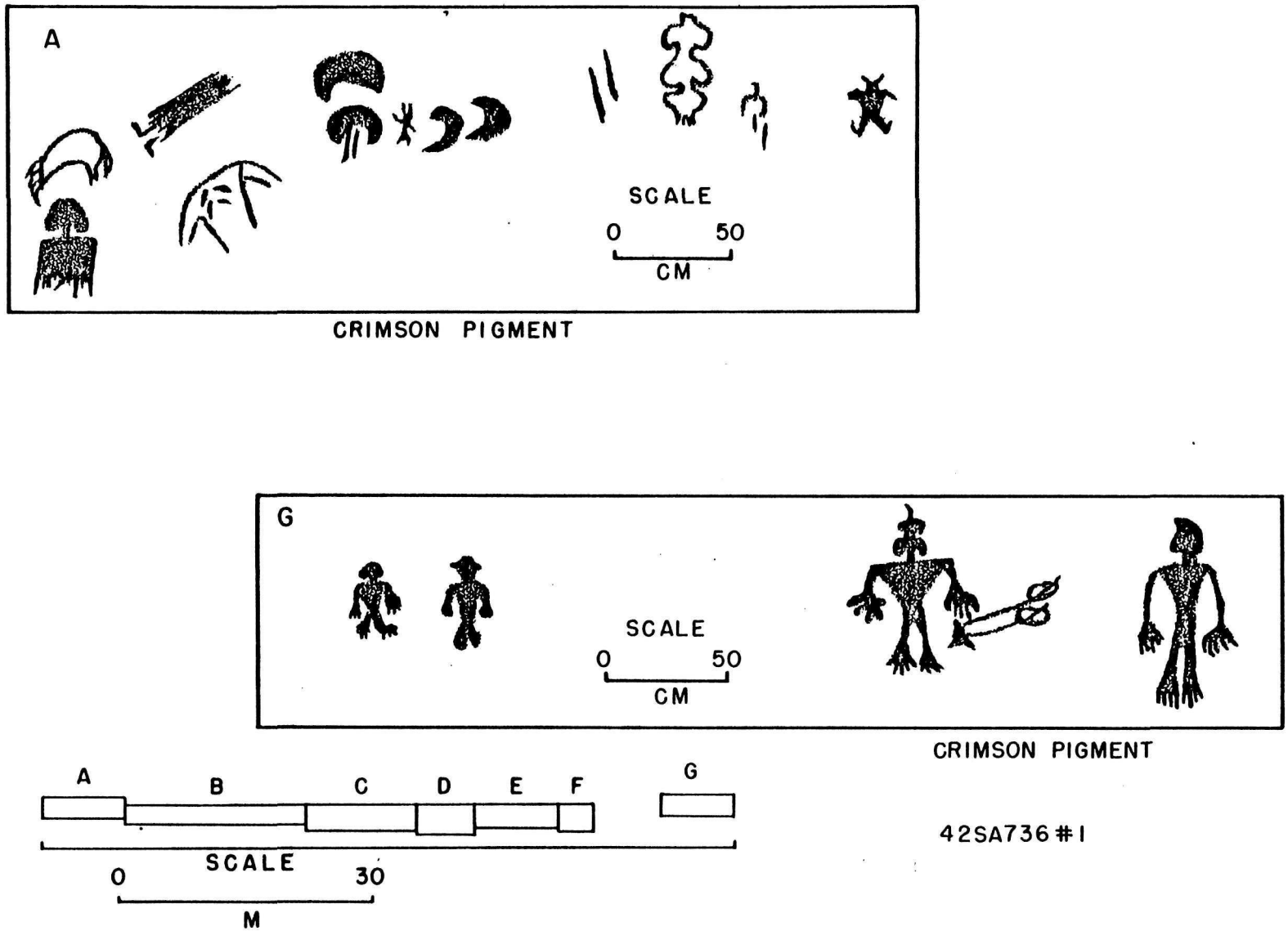


Figure 78. Rock art (42SA736 #1)

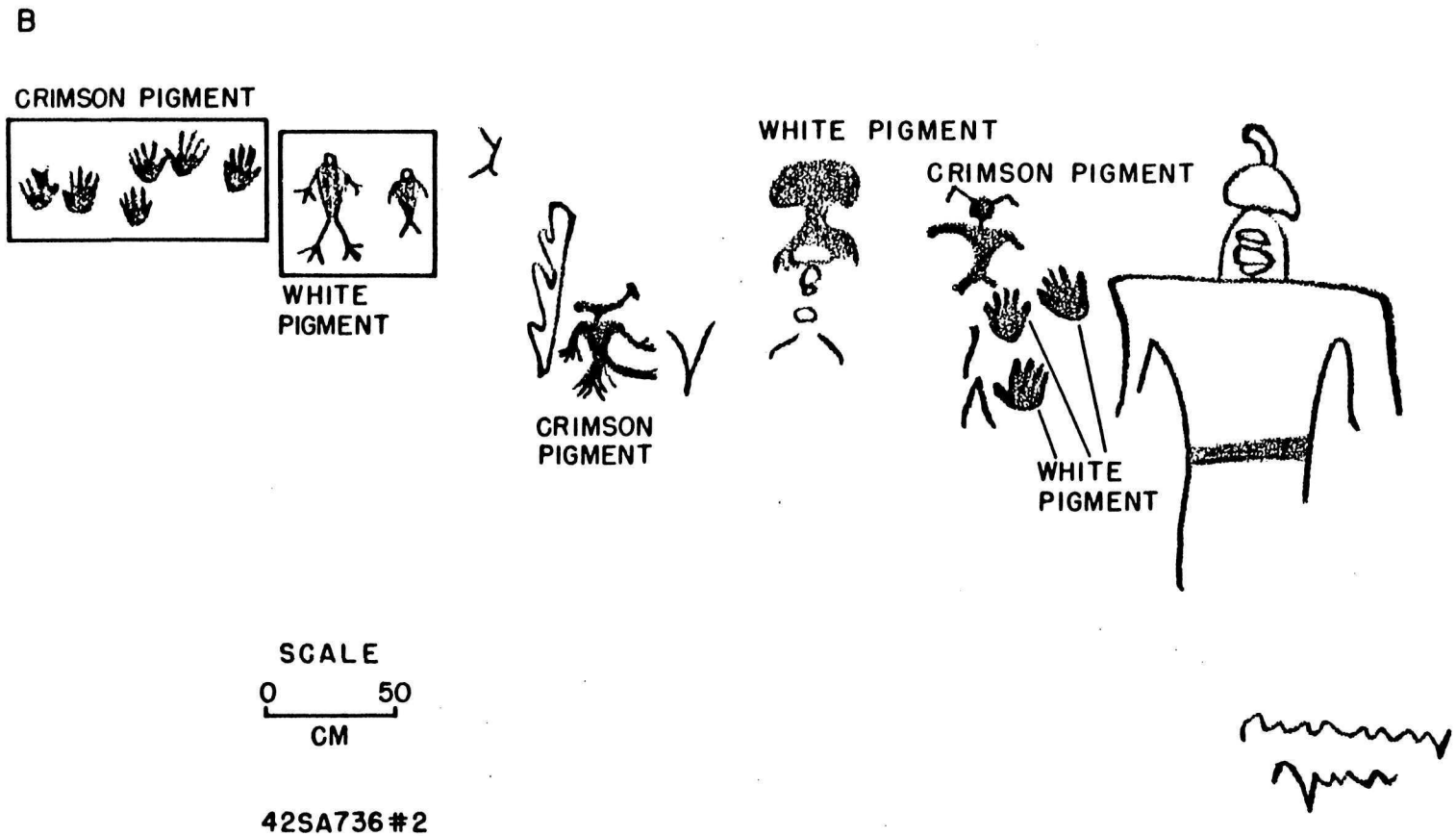


Figure 79. Rock art (42SA736 #2)

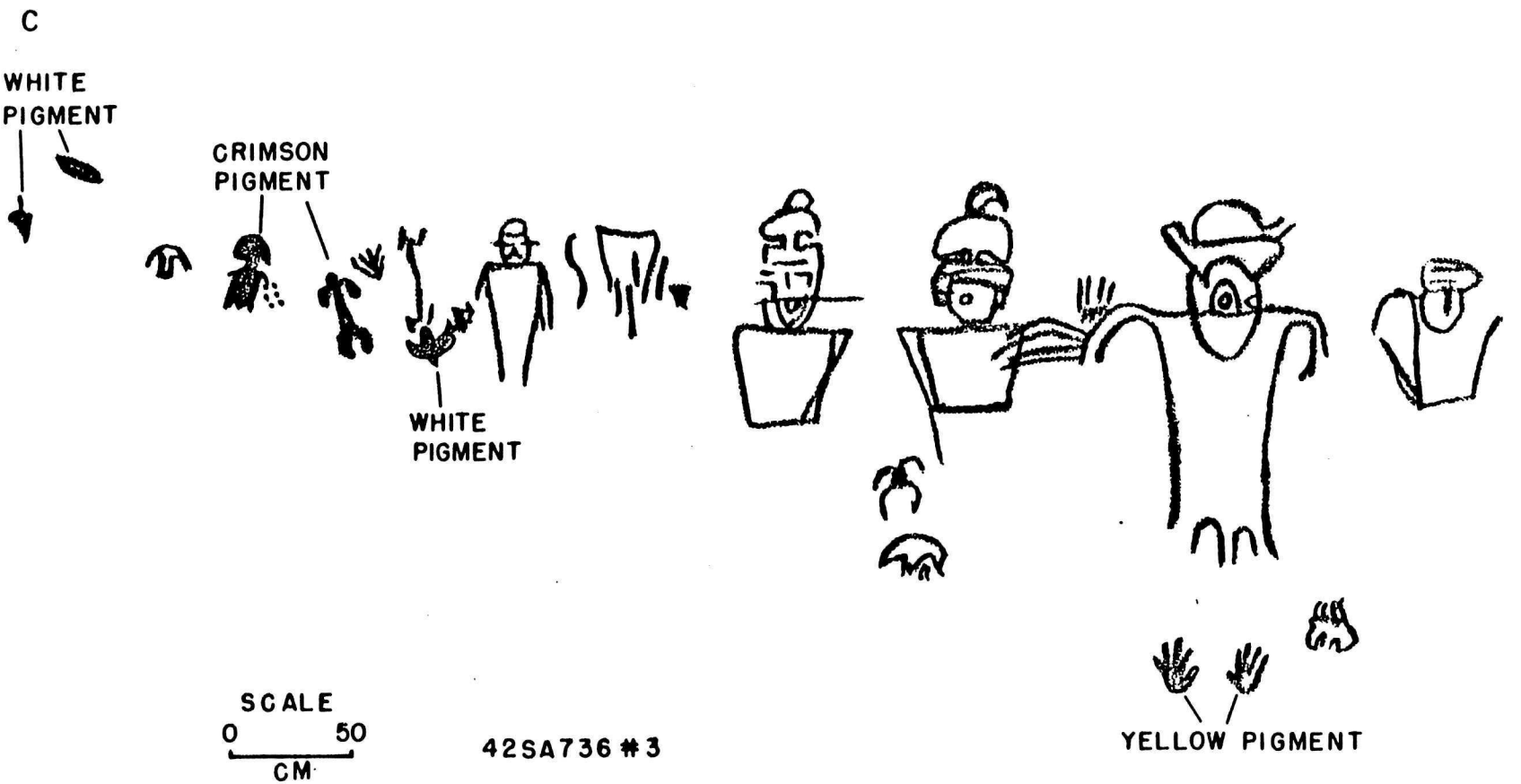


Figure 80. Rock art (42SA736 #3)

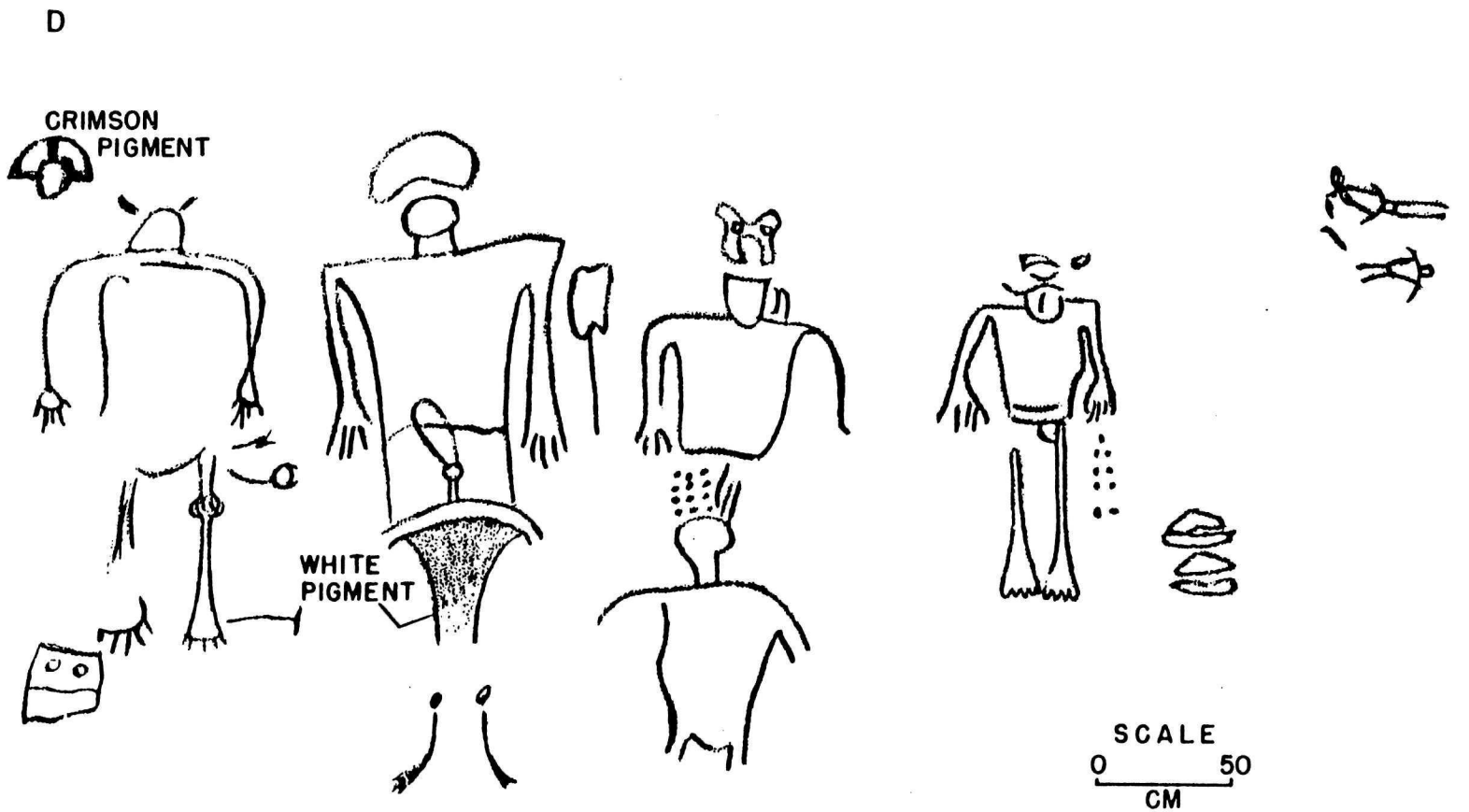


Figure 81. Rock art (42SA736 #4)

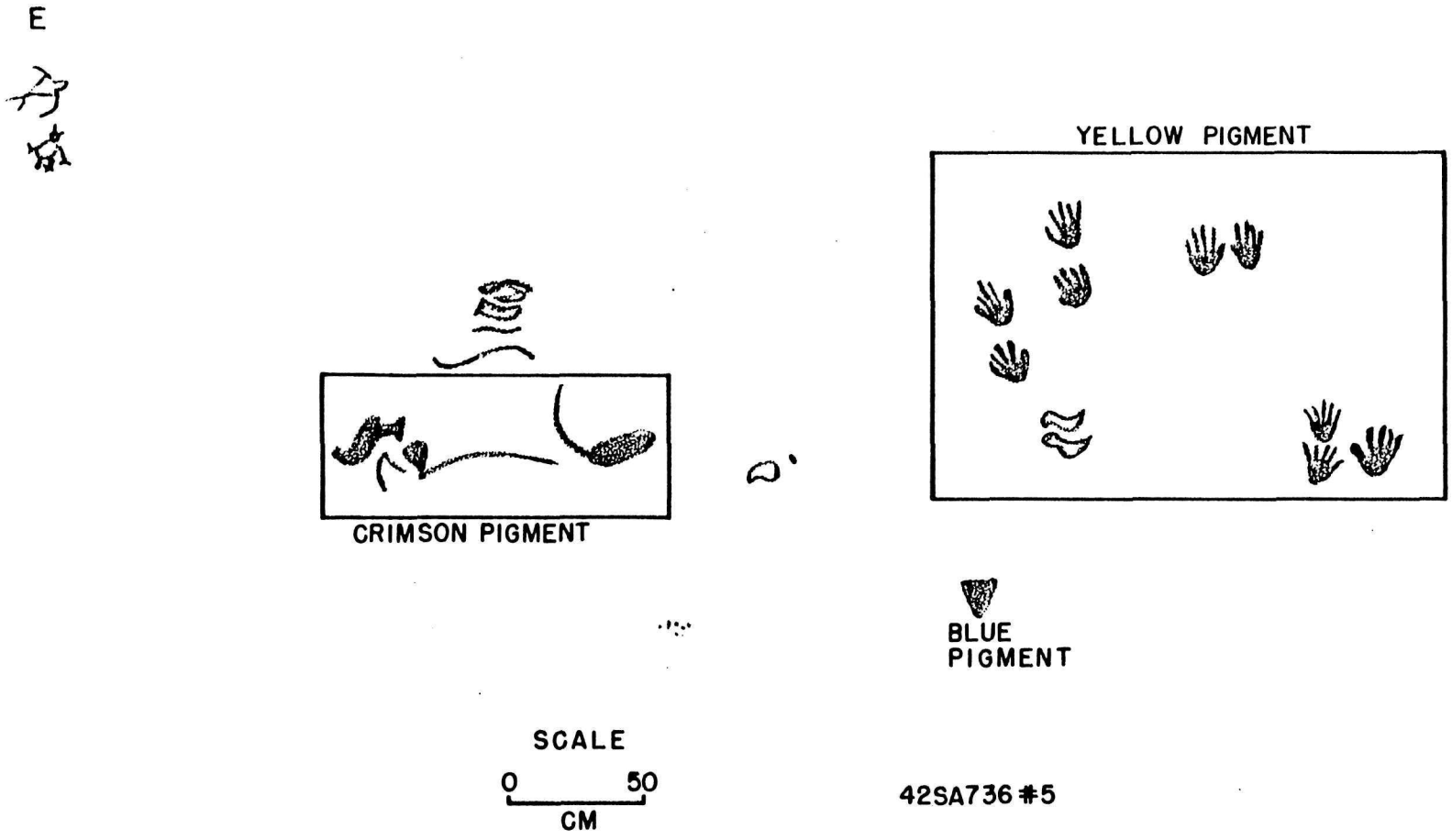


Figure 82. Rock art (42SA736 #5)

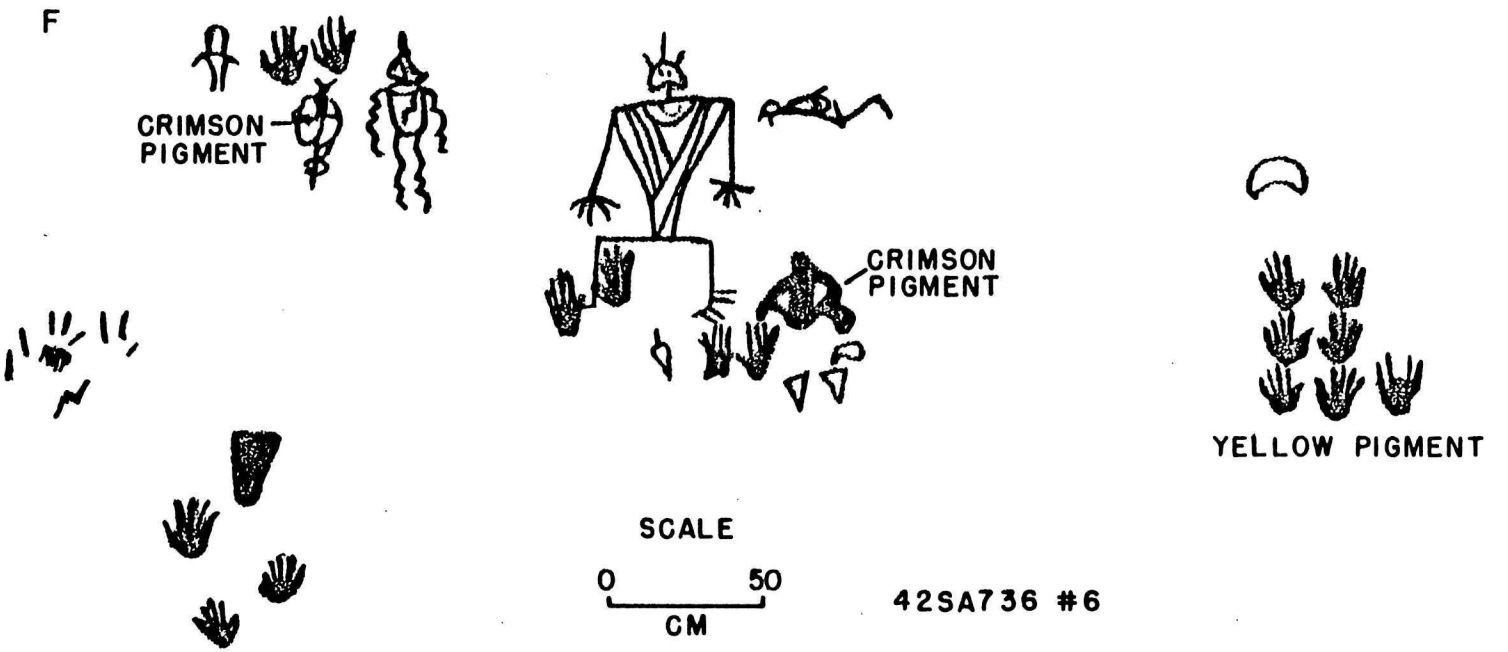


Figure 83. Rock art (42SA 736 #6)

The most striking feature of these panels, however, is the head gear of the anthropomorphs. They are what Turner (1963:6) has termed "hat-topped anthropomorphs." Since facial features do not occur with these "hats," but single circles, lines, concentric circles, and other features are common where the faces should be, it is likely that these and the "hats" represent masks or some other form of ceremonial head gear.

Style

The style is Glen Canyon Style 4.

42SA748 (Fig. 84)

Description

This petroglyph panel is dominated by a large (appx. 80 cm.), carefully executed pecked spiral. There are also two small spirals, rows of tick marks, a large ticked line, one small stick-figure anthropomorph, wavy lines, parallel curved lines, circles, tracks of various sorts, what may be a stylized mountain sheep, a figure resembling a Greek *phi*, and many nonrepresentational elements.

Style

The style is possibly Schaafsma's Virgin Kayenta Style

42SA753 (Fig. 85, 86)

Description

There are two petroglyph panels at this site, appx. a meter apart, which contain very similar anthropomorphic figures. The figures have long, rectangular bodies, broadening slightly at the shoulders, single-line lower extremities, and small, triangular heads without adornments or facial features. Both figures have a triangular patch inside the left shoulder and a wide band across the bottom of the trunk; and both have arrowlike phallic representations on the right side of

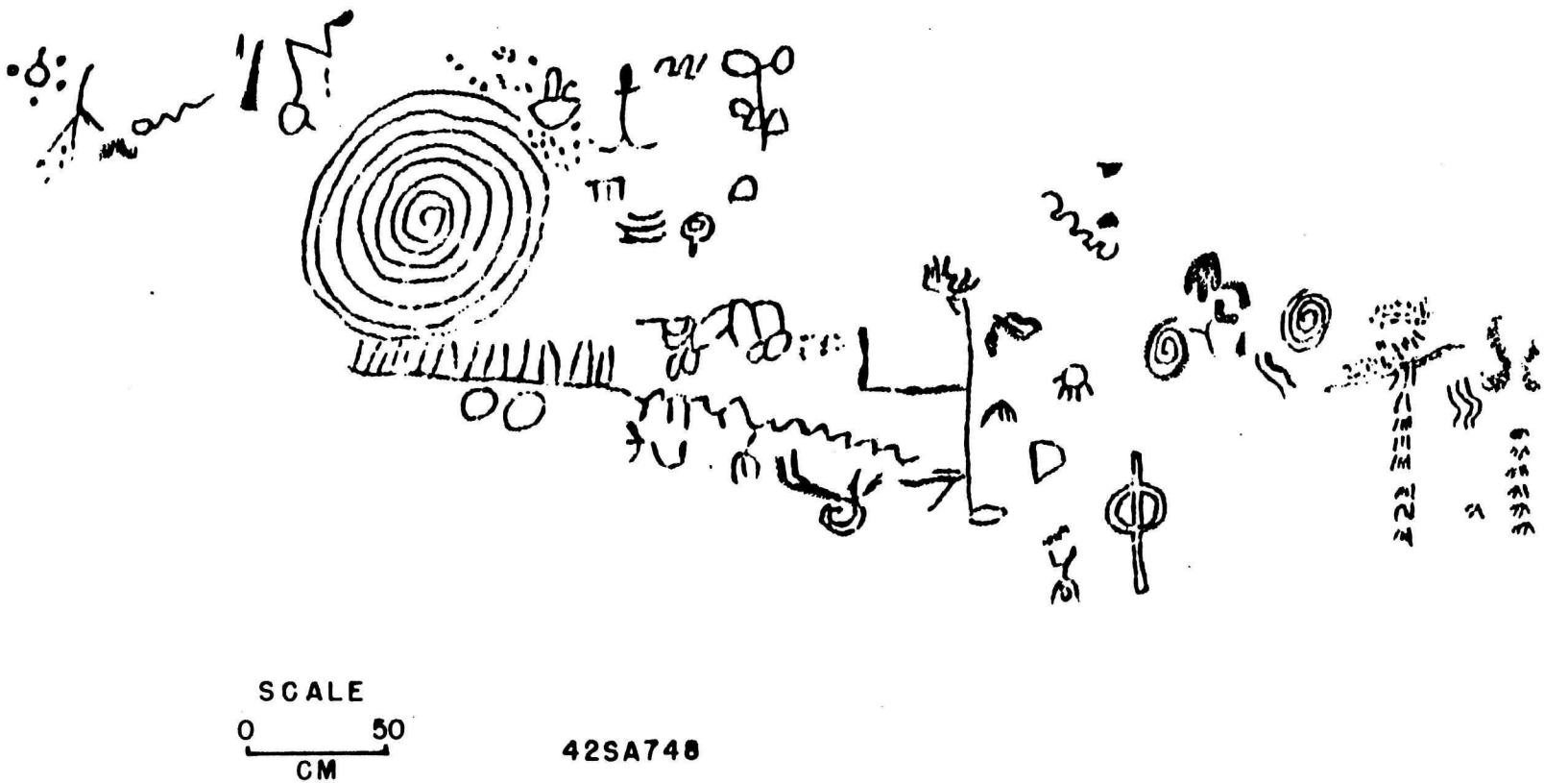


Figure 84. Rock art (42SA748)

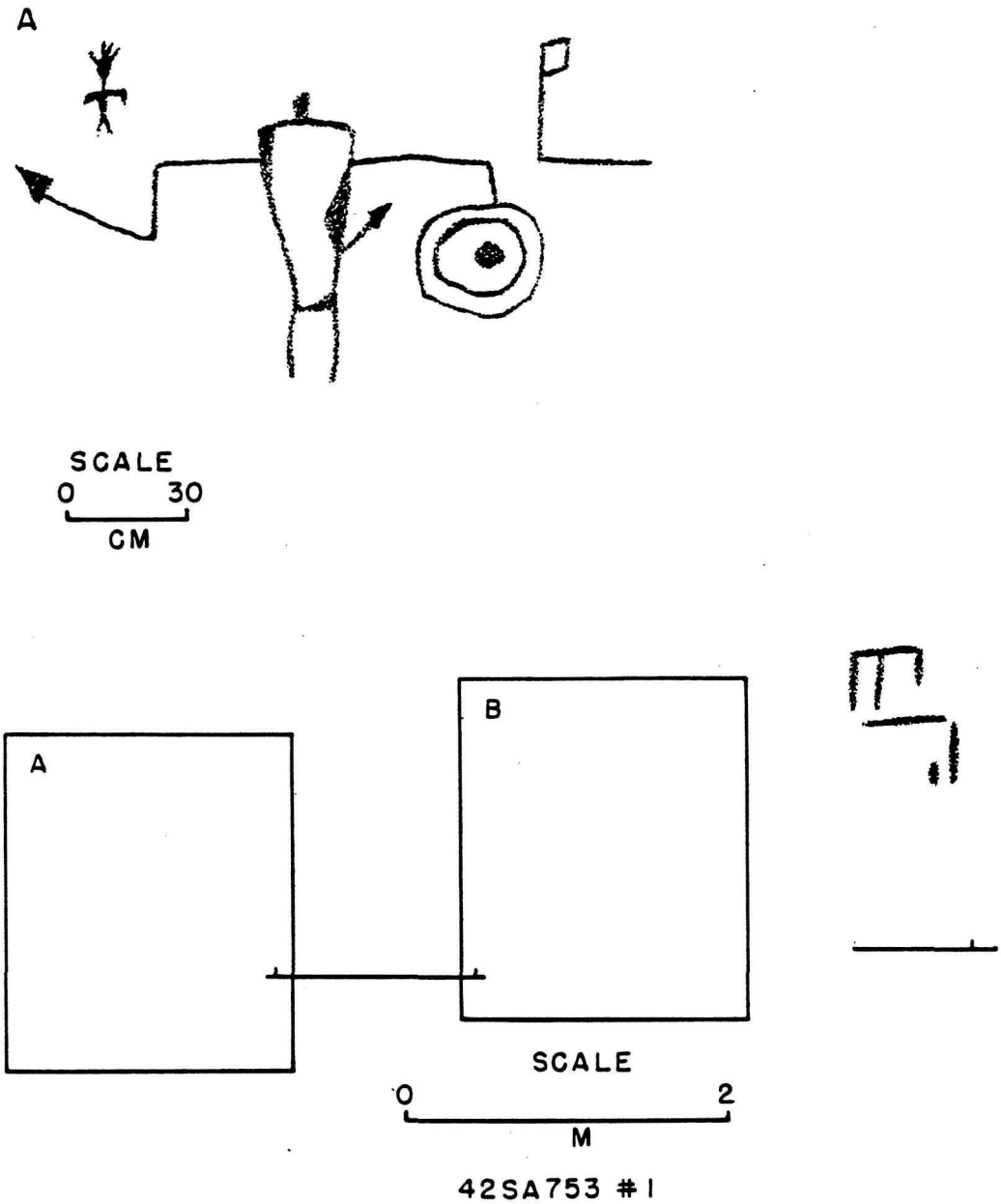


Figure 85. Rock art (42SA753 #1)

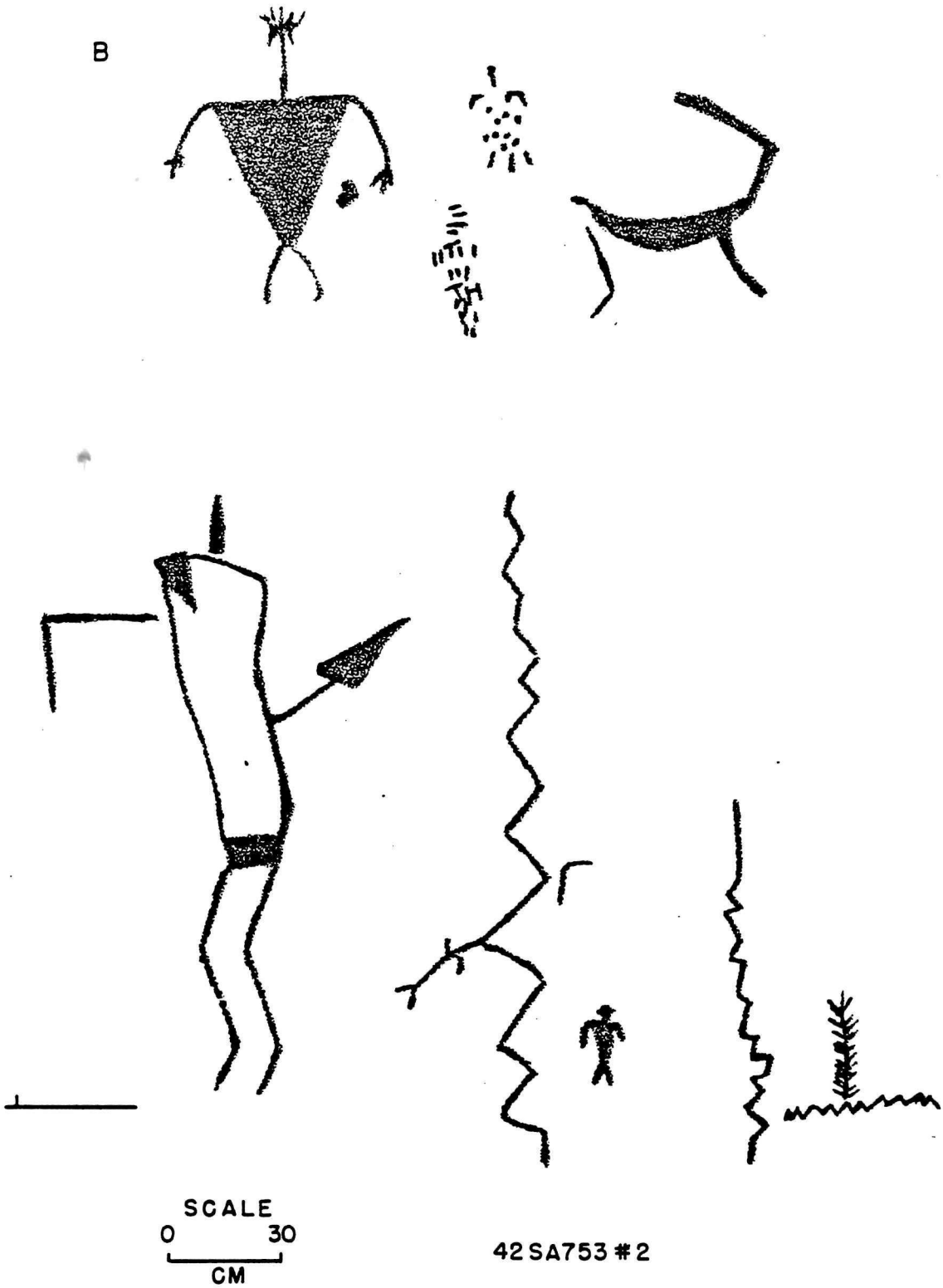


Figure 86. Rock art (42SA753 #2)

the trunk. One figure has two upper extremities, both extending horizontally from just below the shoulders then bending downward; one ends in an arrow figure, the other in a double concentric circle with a dot center—probably a shield. The other anthropomorph has only a single upper extremity; it is also bent downward, but holds nothing.

The first panel also consists of two rectilinear abstracts and a small, stick figure anthropomorph with four lines projecting upward from the head. The second panel, in addition the dominant anthropomorph, also contains zigzag lines (snakes?), a possible scorpion motif, what may be a poorly executed bird-bodied sheep, two abstracts consisting of ticks or short lines, and two additional anthropomorphs. Both of the latter have triangular torsos with legs coming from the lower point and arms from the upper points. The larger of the two has a very long neck, five projections from the top of the head, and two from the bottom—the latter perhaps representing earbobs.

Style

The style is possibly both Glen Canyon Style 5 and Style 4; perhaps even a 5/4 transitional panel (see *Art Styles in Moqui Canyon*).

42SA757 (Fig. 87)

Description

This site consists of two panels: an elaborate pictograph executed in greyish-white pigment and a petroglyph of a single zoomorph (almost certainly a sheep) executed in outline by pecking single dints. The pictograph panel has what would be an excellent argument for the "sympathetic hunting magic" interpretation of rock art meanings. A large, elaborate shield figure is connected by a double zigzag line to the muzzle of one of two carefully-executed mountain sheep. Both sheep have arrows in their bodies, one in the

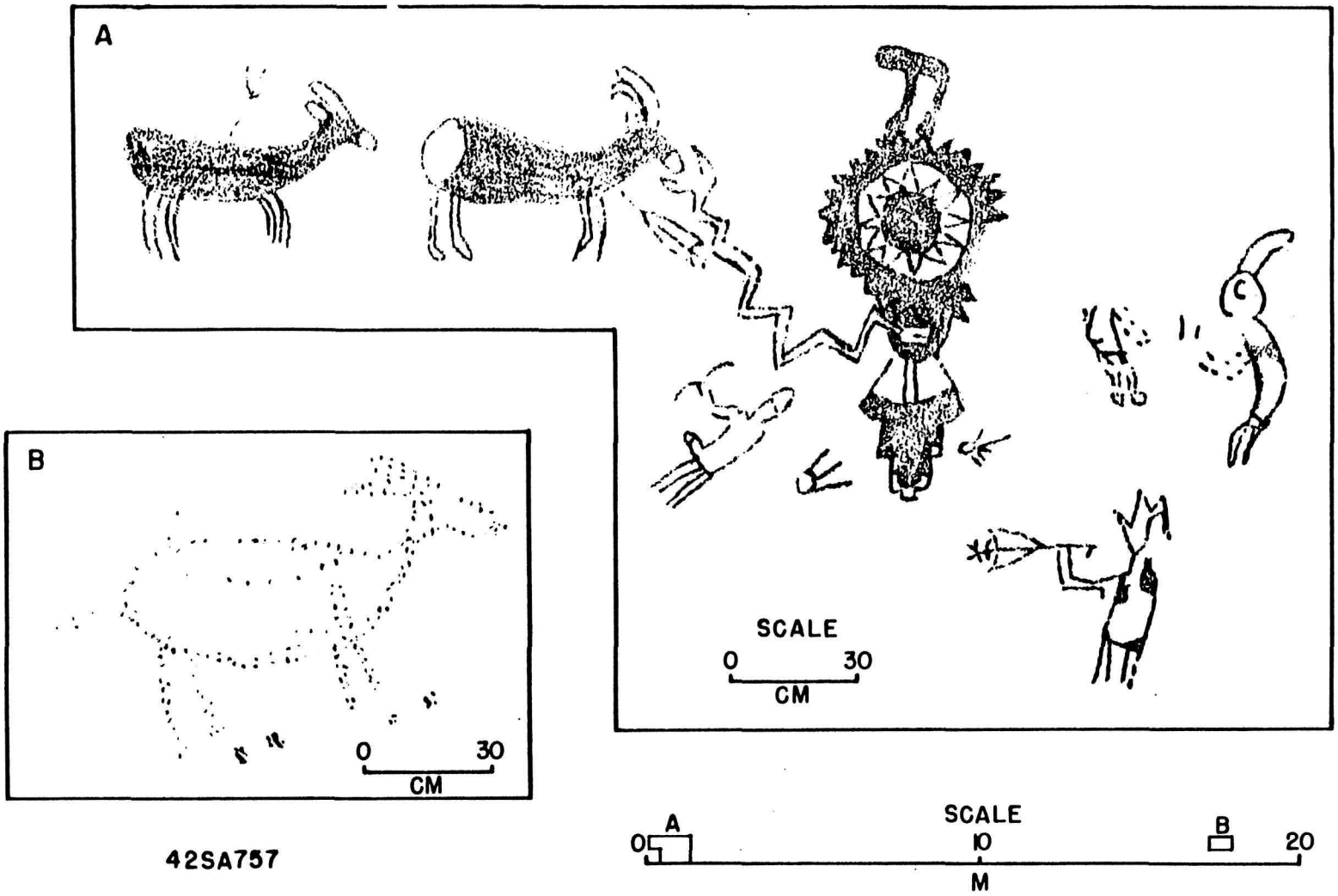


Figure 87. Rock art (42SA757)

back and one in the chest. Two complete, rectangular-bodied hunter figures--one with a bow and arrow and a phallic representation and the other apparently holding his bow and arrow pointing toward himself rather than toward the sheep--and two partially complete anthropomorphs complete the panel.

Style

The style is unknown; the shield figure resembles Schaafsma's Southern San Rafael Fremont.

42SA762 (Fig. 88-94)

Description

Panels A, B, and G are on a cliff face; panels C-F occur on individual boulders.

By far the most common figure at this site is the mountain sheep. A few other zoomorphs appear—mostly dogs—and four anthropomorphs occur. But except for one squiggle maze, a few wavy lines (snakes?), and some branched figures that are probably tracks, this is a site of mountain sheep. A few figures are pictographs executed in a light-yellow pigment, but most are petroglyphs.

The sheep all have back-curved horns and solidly-pecked heads and necks; usually all four legs are represented, and feet are often depicted. Some of the animals, especially in panel E, are done out of the horizontal plane. One animal in panel E has two small sheep heads projecting from its back, but this does not appear to be an attempt to represent pregnancy. The most striking feature of the sheep, however, is their torso decoration. A few are solid, some have dots, but most have carefully-executed, parallel line or grid patterns filling their bodies.

Three of the anthropomorphs are quite naturalistic, although their bodies are elongated and their legs foreshortened. The fourth anthropomorph is highly

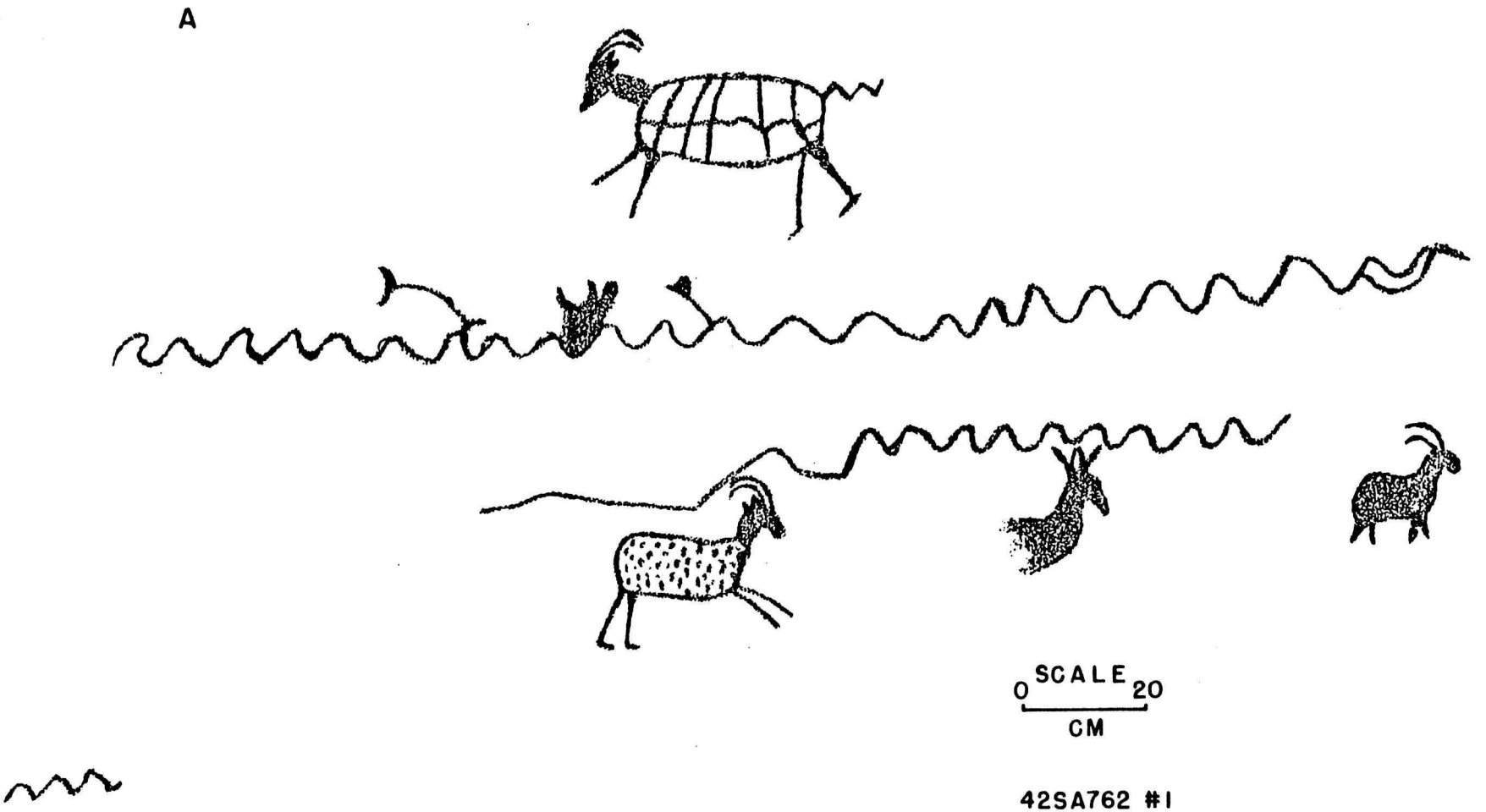


Figure 88. Rock art (42SA762 #1)

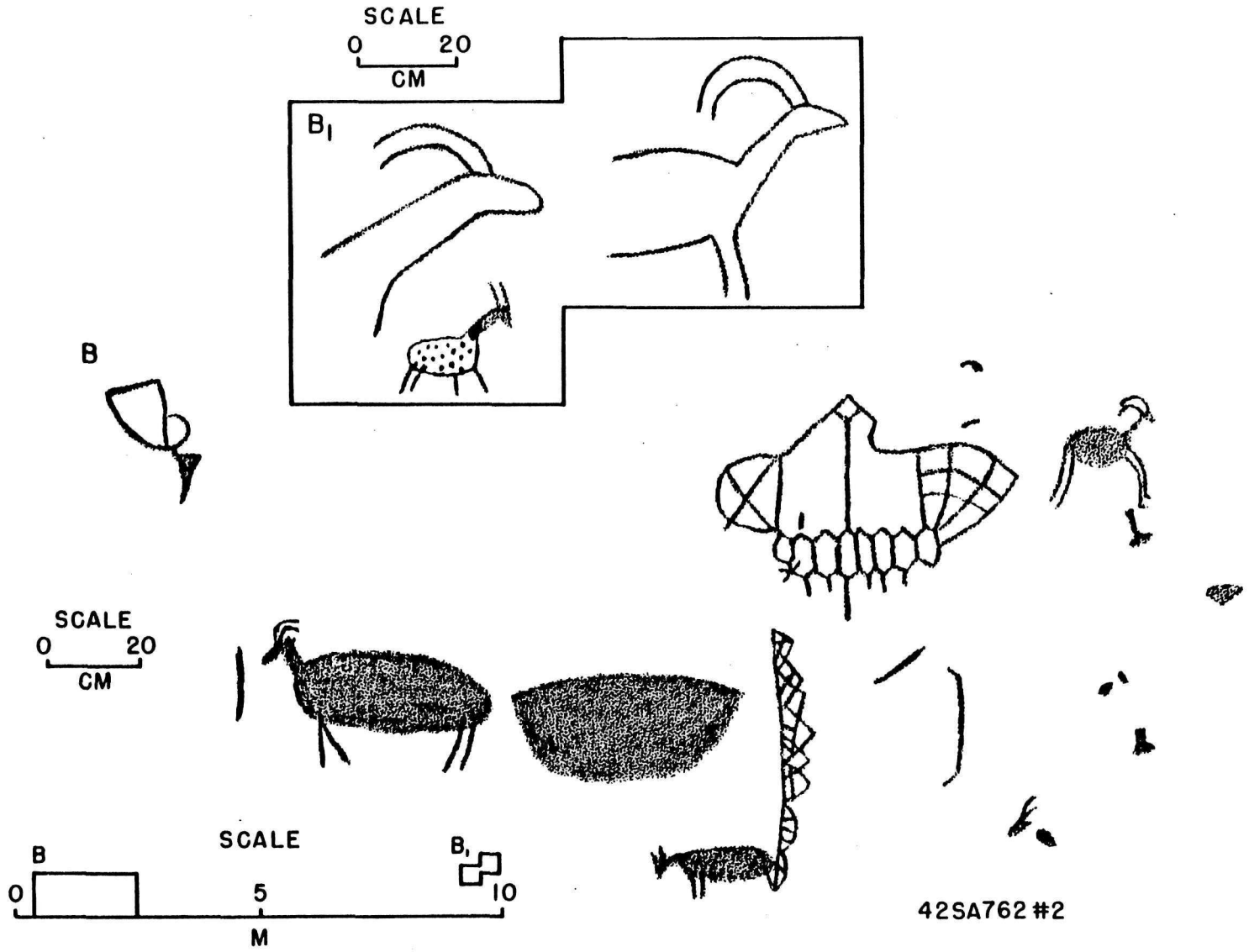


Figure 89. Rock art (42SA762 #2)

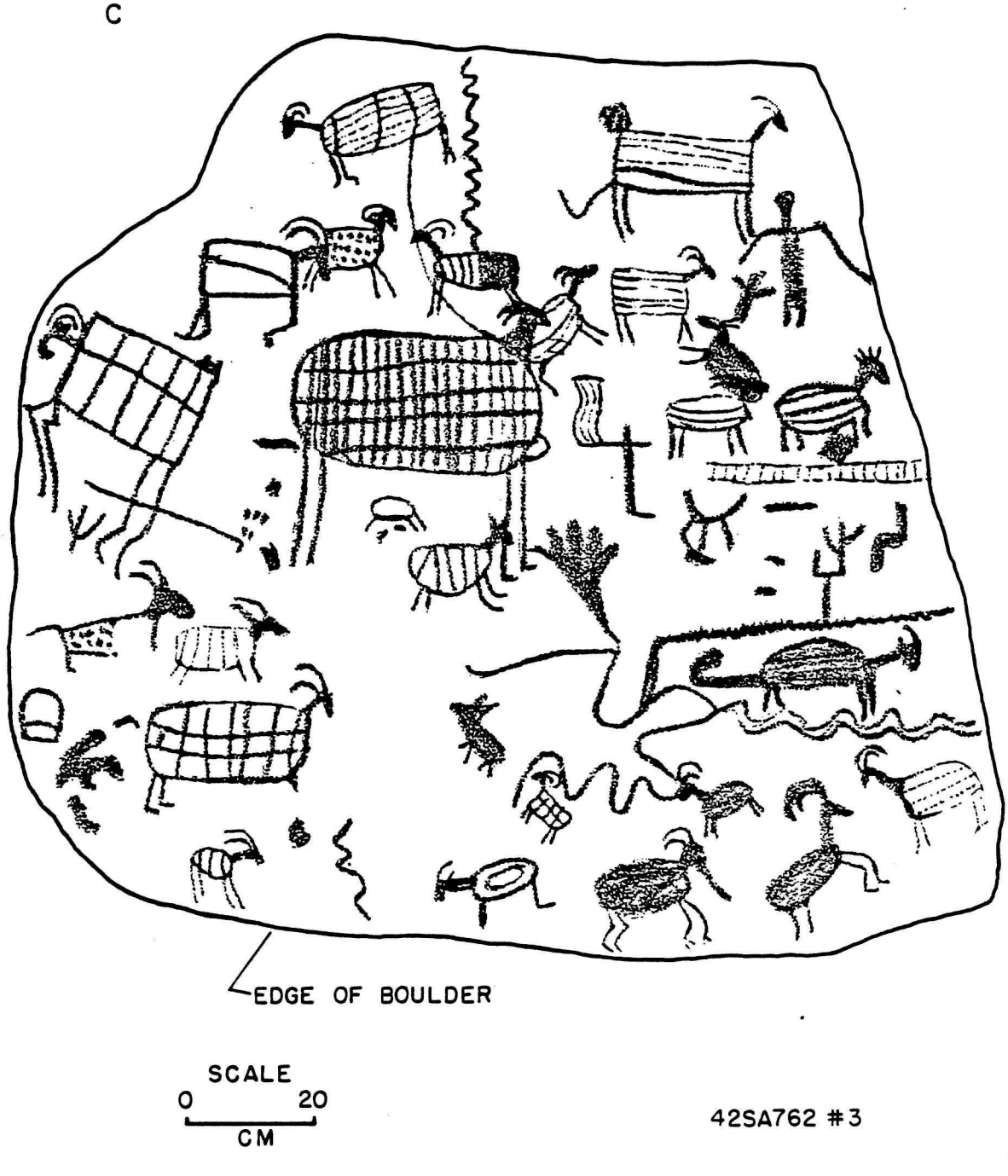


Figure 90. Rock art (42SA762 #3)

Figure 91. Rock art (42SA762 #4)

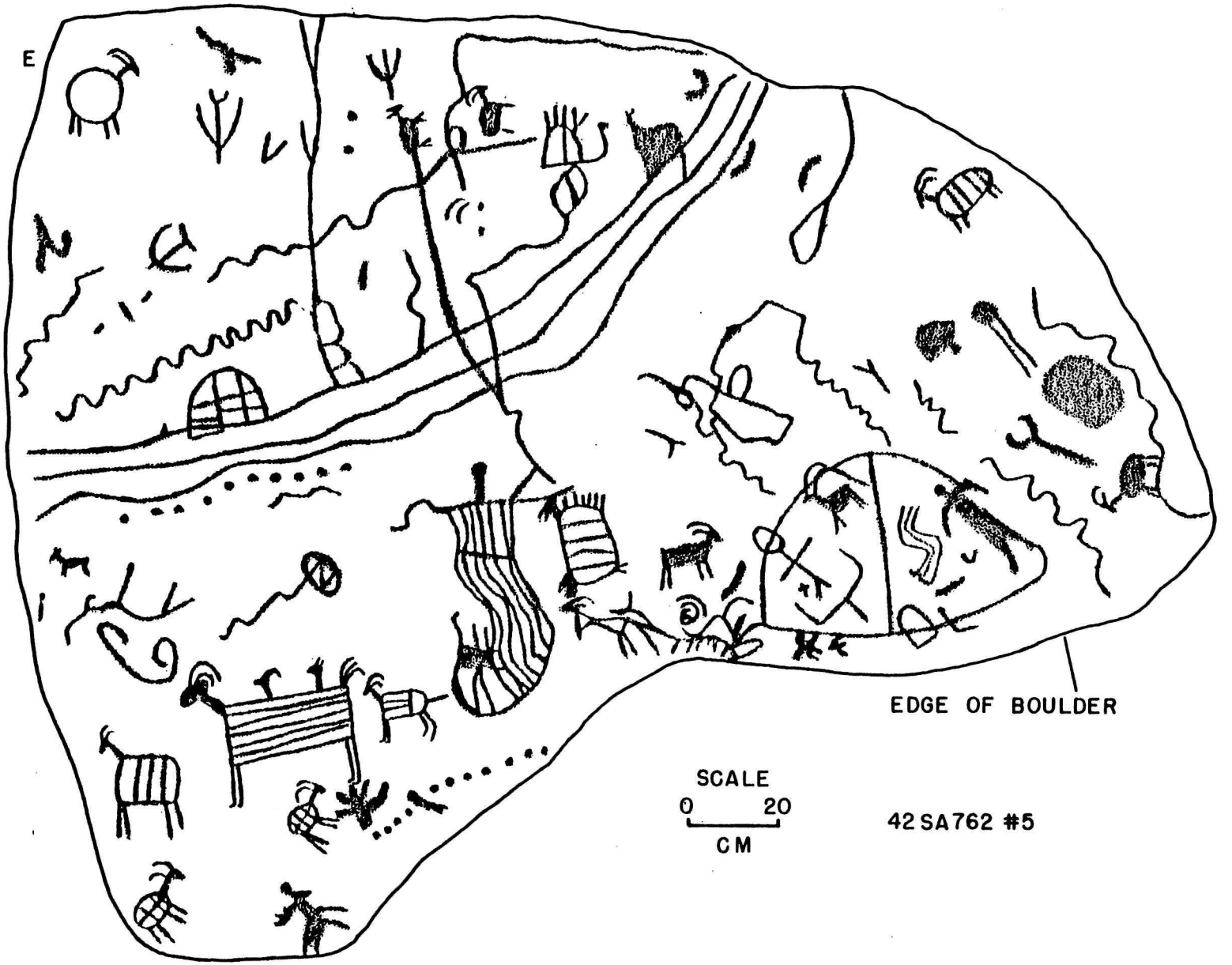


Figure 92. Rock art (42SA762 #5)

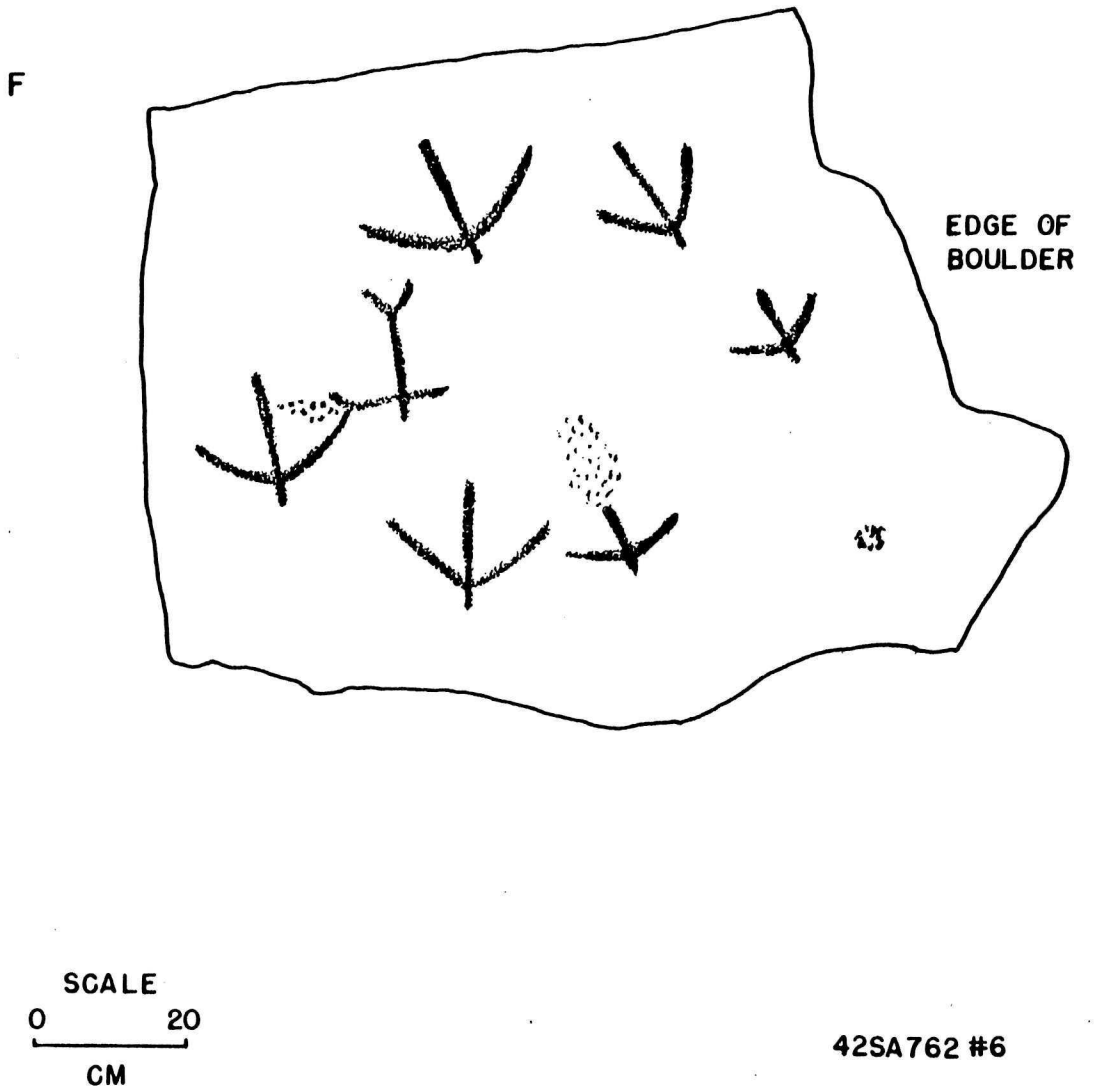


Figure 93. Rock art (42SA762 #6)

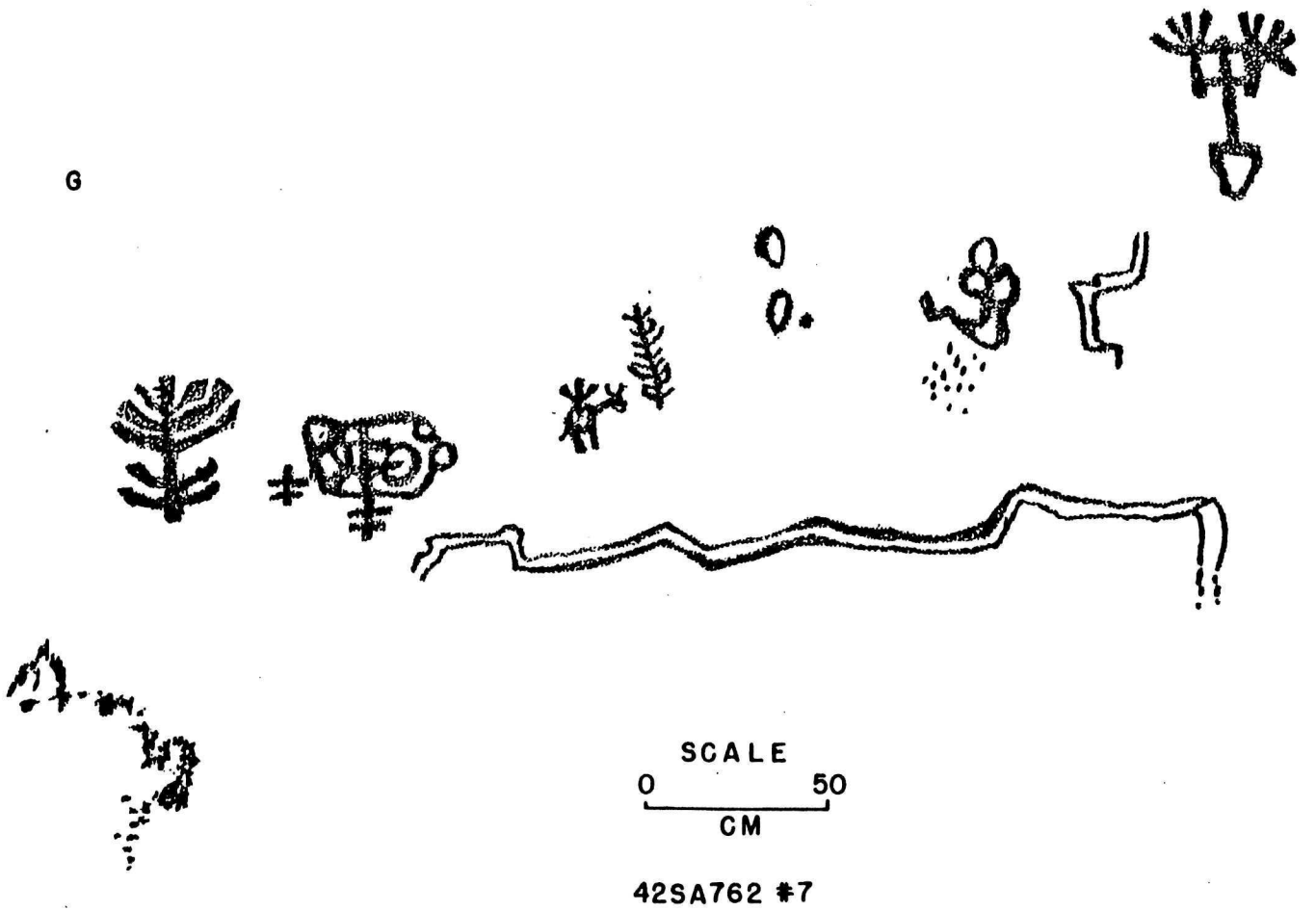


Figure 94. Rock art (42SA762 #7)

stylized with a long, curving, J-shaped torso. The interior of the torso is decorated with parallel lines like the sheep, is sashed, and ends in fringe rather than lower extremities. The arms are single lines, and the head is small, solid, and undecorated.

Panel G consists entirely of petroglyphs of abstract figures. A single possible exception is the figure in the upper right corner of the panel which may be a stick-figure anthropomorph with a branching headdress. Given the absence of such headdresses in the Moqui Canyon rock art and the branching patterns of the other abstract figures in this panel, it is unlikely that an anthropomorph is represented here.

The other figures include a double meandering line, two single-pole ladders, and two branching patterns that may be scorpion motifs or plants.

Style

The style is Glen Canyon Style 5.

42SA5487 (Museum of Northern Arizona site number NA6884) (Fig. 95, 96)

Description

This site comprises two sets of panels. The first set consists of two panels of zoomorphs. One panel contains two sheep with triangular bodies, single legs (one front and one back) with feet, and back-curving horns. The third animal, if it is indeed an animal, on this panel is executed in a very different style. Its body is represented by a single line; a short tail is shown; the legs are wide, curved lines; the "horns" rise from the forehead and then turn sharply back to form a circle.

The second panel of the first set contains a single zoomorph with a solid head, back-curving horns, an elongated outlined body with a diagonal line through it behind the shoulders, four legs with feet, and no tail.

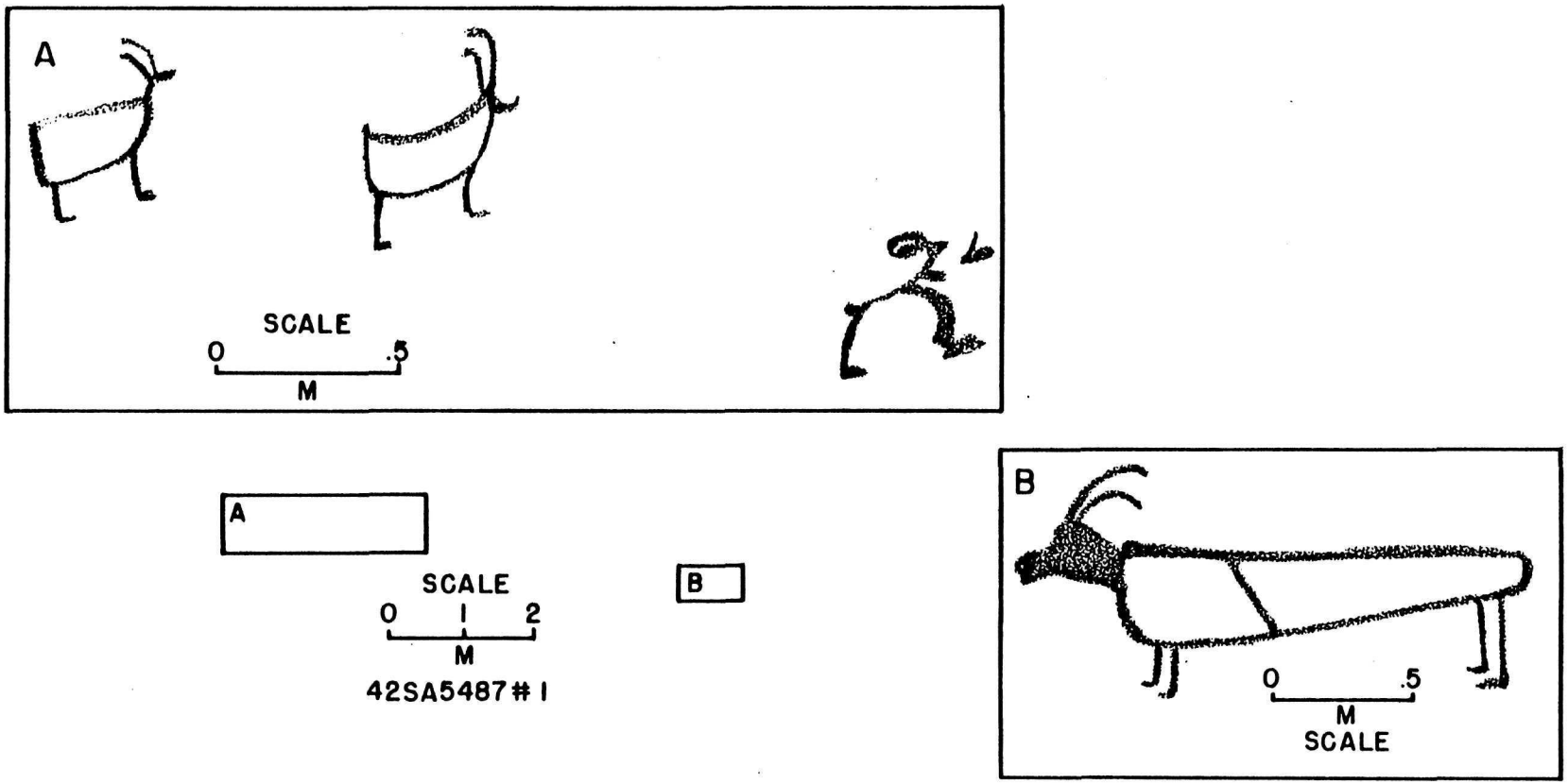


Figure 95. Rock art (42SA5487 #1)

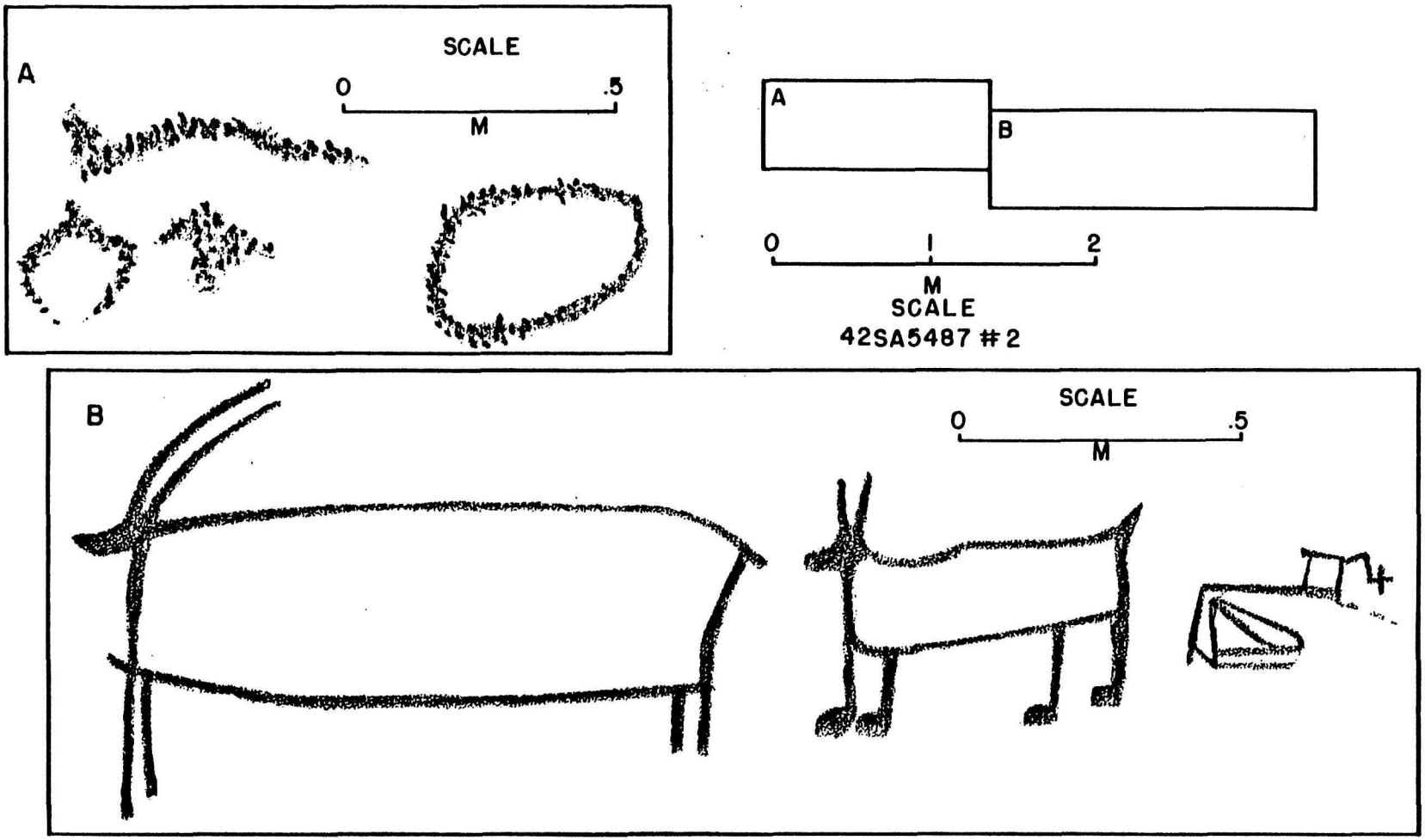


Figure 96. Rock art (42SA5487 #2)

The second set also consists of two panels. On one, closely-pecked bands of dots form an oblong and three other nonrepresentational figures. The other panel contains two boxy-bodied zoomorphs, both with four legs, the smaller having feet represented as well. The larger has back-curving horns, the smaller has shorter, straight horns or long ears. This panel also includes a straight line element abstract.

Style

Mixture of Glen Canyon Styles 4 and 5 (Turner 1963:24).

Art Styles in Moqui Canyon

The one major study of rock art which is most useful for this analysis is Turner's *Petrographs of the Glen Canyon Region* (1963). With two exceptions, all of the rock art panels described above which have a sufficient number of elements to make identification as to style possible will fit into one or two of Turner's five Glen Canyon styles.

Site 42SA762 is an excellent example of Turner's Glen Canyon Style 5. The predominance of sheep and the linear designs on the bodies of the sheep are examples of the two major distinguishing characteristics of this style. The stylized anthropomorph with the elongated rectangular body filled with cross-hatching is also highly characteristic as is the squiggle maze in panel B. On the basis of close association with dated and pottery-producing sites, Turner has assigned the Style 5 art to the pre-A.D. 1050 Anasazi cultures—early P-II, P-I, and Basketmaker (1963:1).

One interesting pair of panels, site 42SA753, display both typical Style 4 solid triangular anthropomorphs and two elongated rectangular anthropomorphs more reminiscent of Style 5. Both rectangular figures have exaggerated phallic representations and one has what appears to be a shield—both of which are

Style 4 traits. Both rectangular anthropomorphs show a tendency toward broadening at the shoulders and narrowing at the hips that may be transitional between rectangular and triangular body forms. Unfortunately, I have only drawings to work from, and data as to execution techniques and possible differential patination or weathering is not available. If the two types of figures are contemporaneous, they might well be indicators of the Style 5/Style 4 transition. On this subject Turner comments:

> On the basis of the Glen Canyon region petrographs, sound reason exists to believe that the rectangular forms are earlier than triangular ones and that the latter developed partially out of the former. Also, both forms exist together on a specific panel with nearly identical weathering and patination. This is suggestive of a developmental or evolutionary sequence with both styles being in vogue at some time starting around A.D. 1050 (1963:7).

The two possible exceptions to the Glen Canyon style identifications of this material are: 1) Site 42SA748 with its spirals, rake, and *phi* figures, which more closely resemble Schaafsma's Virgin Kayenta styles (see especially Schaafsma 1971:figs. 128 and 131); and 2) Site 42SA757. The latter site, though its hunting motif, sheep, and phallic displays are common to Glen Canyon Style 4, is unusual in the extremely realistic depiction of the sheep and in the large figure in the center which is inescapably suggestive of hunting magic. The upper portion of this figure is very like many Fremont shield figures, especially those of the White Canyon region described by Schaafsma as part of her section on the Southern San Rafael Fremont (see especially Schaafsma 1971:fig. 51a).

In general, the rock art in Moqui Canyon is quite consistent in style and execution. Although Sharrock et al. (1963:44) suggest that some of the pictographs at 42SA736, Bernheimers Alcove, date to Basketmaker times, it seems clear that most, according to Turner's dating, are of a P-II or P-III age. This, of course, is in line with the excavated archeological data from the canyon.

ARTIFACTS

Pottery

by

Anne Worthington

A total of 1964 sherds were recovered from the sites visited in 1977 (Tables 10-13, 15). There were no whole or restorable vessels present. Many of the sherds were quite small and suffered a great deal of erosion which made them unidentifiable. This accounts for the large number of unidentified sherds in the provenience charts. Most of the pottery comes from the Moqui Canyon sites, only one unidentified Tusayan White ware sherd was found on the Dangling Rope benchland. In Gypsum Canyon only 14 sherds were recovered; all from Carol's House (42SA5379). And in Lake Canyon, only a little more than 100 sherds were recovered at two sites.

All sherds were typed according to Colton (1955). Two main traditions were represented—the Mesa Verde and the Kayenta Anasazi. Those sherds representing the Mesa Verde Anasazi constituted 24.5% of the total sherds from the eleven sites where pottery was collected in 1977. On the other hand, the Kayenta tradition comprised 67.6% of the total; while unidentifiable sherds made up the remaining 8%. Kayenta pottery was predominant at every site.

The following varieties of Kayenta wares were found in 1977: Tusayan Gray Ware, Tusayan White Ware, and Tsegi Orange Ware. Those sherds of Mesa Verde origin were only represented by the Mesa Verde-San Juan White Ware and the San Juan Red Ware. Only one Mesa Verde Gray Ware sherd was typed.

Table 10. Pottery Provienience for Sites in Lake, Moqui, Gypsum and Dangling Rope Canyons

	Steury Ledge (42SA533) (M)[1] Structure 1 Stratum 1	Steury Ledge (42SA533) (M)[1] Structure 2 Fill	42KA1709 (DR)[1] Surface	42SA684 (M)[1] Surface	42SA551 (L)[1] Surface	42SA5486 (M)[1] Surface	Carols House 42SA5379 (G)[1] Surface	42SA6317 (M)[1] Surface	TOTAL
Tusayan Gray Ware									
Tusayan Corr.		1		1			4		6
Moenkopi Corr.	1								1
Kana-a Grey					1				1
Kiet Siel Grey								2	2
"Clapboard Corr."									
O'Leary Tooled									
Tusayan White Ware									
Tusayan B/W									
Kayenta B/W									
Flagstaff B/W									
Black Mesa B/W							1		1
Unidentified			1		1				2
Tsegi Orange Ware									
Tusayan B/R									
Tsegi Orange									
Tusayan Poly.									
Citadel Poly.									
Tsegi R/O									
Unidentified									

[1](DR) Dangling Rope Canyon; (G) Gypsum Canyon; (M) Moqui Canyon; (L) Lake Canyon

Table 10 — Continued

	Steury Ledge (42SA533) (M)[1] Structure 1 Stratum 1	Steury Ledge (42SA533) (M)[1] Structure 2 Fill	42KA1709 (DR)[1] Surface	42SA684 (M)[1] Surface	42SA551 (L)[1] Surface	42SA5486 (M)[1] Surface	Carols House 42SA5379 (G)[1] Surface	42SA6317 (M)[1] Surface	TOTAL
Mesa Verde White Ware									
Mancos B/W							2		2
McElmo-Mesa Verde B/W 1							1		2
Unidentified					1	2	3		7
San Juan Red Ware									
Abajo R/O									
Abajo Poly.									
Unidentified									
Mesa Verde Gray Ware									
Mancos Corr.									
"Clayed-over Ware"									
Navajo Utility Ware					30				30
Unidentified							2		2
TOTAL	2	1	1	1	33	2	14	2	56

[1](DR) Dangling Rope Canyon; (G) Gypsum Canyon; (M) Moqui Canyon; (L) Lake Canyon

Table 11. Pottery Provenience at Rappel Ruin (42SA683, Moqui Canyon)

	Fill, Structure 1	Fill, Structure 2	Fill, Structure 4	Fill, Structure 5	Midden (rat)	Total
Tusayan Gray Ware						
Tusayan Corr.	1	8	2	1	5	17
Moenkopi Corr.		5				5
Kana-a Grey						
Kiet Siel Grey						
"Clapboard Corr."						
O'Leary Tooled						
Tusayan White Ware						
Tusayan B/W						
Kayenta B/W						
Flagstaff B/W						
Black Mesa B/W						
Unidentified					1	1
Tsegi Orange Ware						
Tusayan B/R						
Tsegi Orange						
Tusayan Poly.						
Citadel Poly.						
Tsegi R/O						
Unidentified			2	1	1	4
Mesa Verde White Ware						
Mancos B/W						
McElmo-Mesa Verde B/W	1					1
San Juan Red Ware						
Abajo R/O						
Abajo Poly.						
Unidentified						
Mesa Verde Gray Ware						
Mancos corr.						
"Clayed-over Ware"						
Navajo Utility Ware						
Unidentified						
TOTAL	2	13	4	2	7	28

Table 12. Pottery Provenience at The Over Site (42SA6214, Moqui Canyon)

	Surface	Surface Midden A	Midden B	Fill, Structure 1	Fill, Structure 2	Floor, Structure 2	Fill, Structure 3	Floor, Structure 3	Total
Tusayan Grey Ware									
Tusayan Corrugated	94	35	1	3		1	1	1	136
Moenkopi Corrugated	72	30		1		3	2	15	123
Kana-a Grey	20	2							22
Kiet Siel Grey	42	3				2		3	50
"Clapboard Corrugated"		4			1				5
Tusayan White Ware									
Tusayan B/W	15				1			7	23
Kayenta B/W	2								2
Flagstaff B/W	1								1
Black Mesa B/W									—
Unidentified	40	9			3		3		55
Tsegi Orange Ware									
Tusayan B/R	3							3	6
Tsegi Orange	22	4				3			29
Tusayan Poly.	4	1						1	6
Citadel Poly.	3	4	2					4	13
Tsegi R/O	1	1							2
Unidentified	44	18		3		5		5	75

Table 12 — Continued

	Surface	Surface Midden A	Midden B	Fill, Structure 1	Fill, Structure 2	Floor, Structure 2	Fill, Structure 3	Floor, Structure 3	Total
Mesa Verde White Ware									
Mancos B/W	10					1			11
McElmo-Mesa Verde B/W	8	2					1	3	14
Unidentified	11	19	2	1	1	1	11	3	49
San Juan Red Ware									
Abajo R/O									—
Abajo Poly.	2							4	6
Unidentified							1	2	3
Mesa Verde Gray Ware									
Mancos Corr.									—
"Clayed-over Ware"									—
Navajo Utility Ware									—
Unidentified	7	10					2	1	20
TOTAL	401	142	5	8	6	16	22	62	662

Table 13. Pottery Provenience at 42SA740 (Moqui Canyon)

	Upper Terrace	Midden on Second Terrace	Lower Terrace	Total
Tusayan Gray Ware				
Tusayan Corr.	91	116	15	222
Moenkopi Corr.	69	44	4	117
Kana-a Grey	24	31	3	58
Kiet Siel Grey	10	6	2	18
"Clapboard Corr."				—
O'Leary Tooled				—
Tusayan White Ware				
Tusayan B/W	10			10
Kayenta B/W	2	1		3
Flagstaff B/W	7	12		19
Black Mesa B/W	2			2
Unidentified	55	26	8	89
Tsegi Orange Ware				
Tusayan B/R	2	4		6
Tsegi Orange	21	4	11	36
Tusayan Poly.				—
Citadel Poly.	4	6		10
Tsegi R/O				—
Unidentified	71	25	2	98
Mesa Verde White Ware				
Mancos B/W	34	39	8	81
McElmo-Mesa Verde B/W	15	44	12	71
Unidentified	103	90	23	216
San Juan Red Ware				
Abajo R/O	2			2
Abajo Poly.				—
Unidentified	1	10		11
Mesa Verde Gray Ware				
Mancos Corr.	1			1
"Clayed-over Ware"		3		3
Navajo Utility Ware				—
Unidentified	26	40	3	69
TOTAL	550	501	91	1142

TUSAYAN GRAY WARE (Fig. 97 a, c, e)

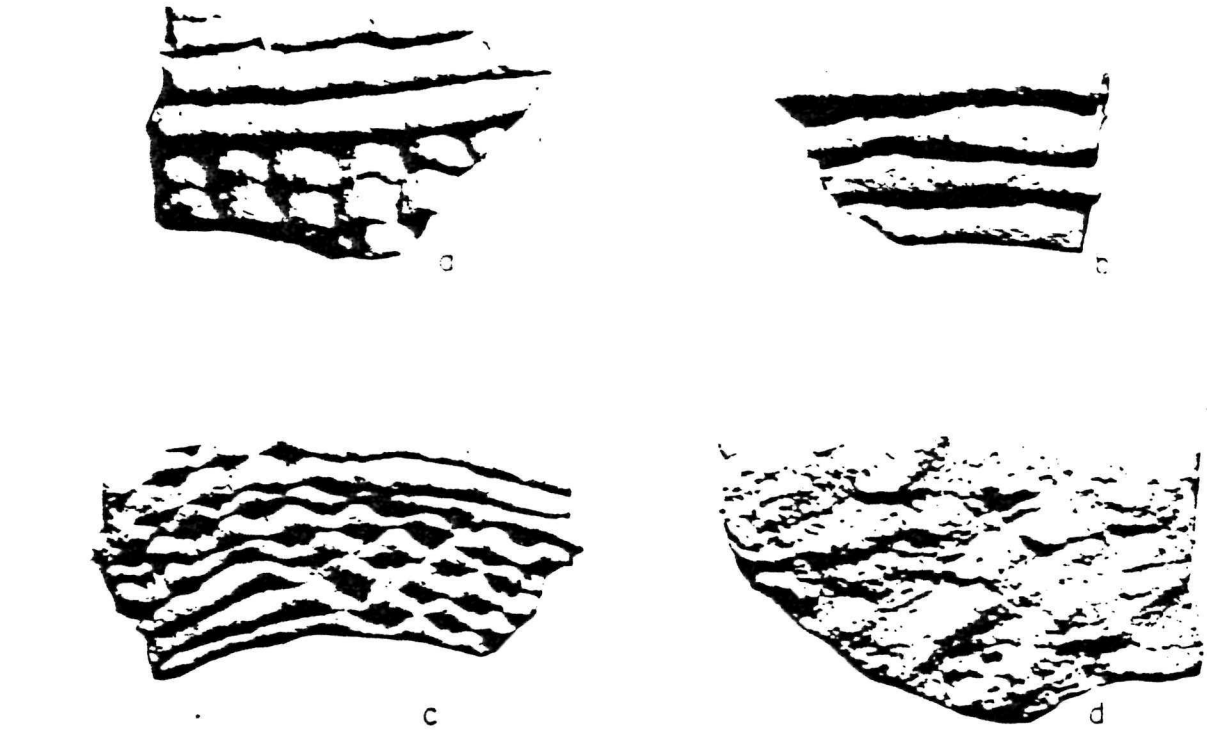
Six types within the Tusayan Gray Ware were found among the sherds recovered in 1977. Though not all sites contained every type, there is a fairly wide distribution of types. Tusayan Corrugated was the most numerous, followed closely by Moenkopi Corrugated. The primary difference between these two types is surface treatment. Both are a gray corrugated ware with sand temper, however the corrugations on the Tusayan Corrugated pottery are much finer and neater, more care seems to have been taken in their construction. The corrugations on Moenkopi Corrugated, however, are much cruder, and indentations in the coils are fewer and of poor quality. Therefore differentiation between these two types is a farily subjective procedure.

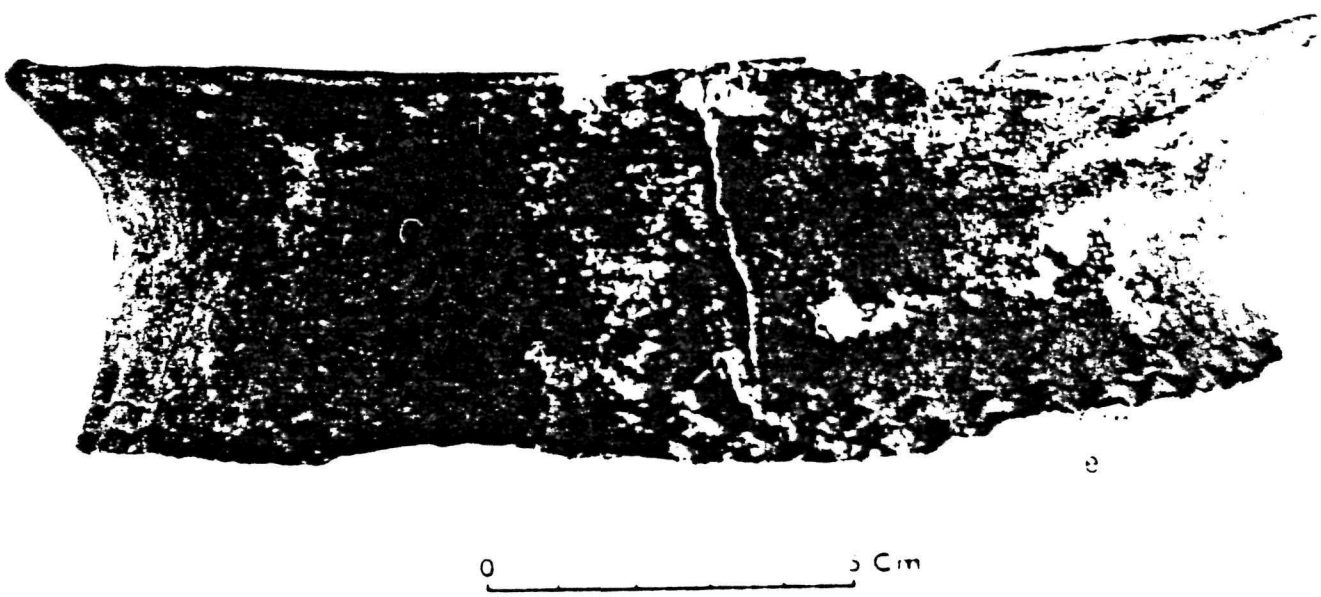
Also present was Kiet Siel Gray, a later, poor looking gray ware. The coils were not always completely obliterated, giving this type an unusual appearance. Several sherds of a tooled variety typed here as O'Leary Tooled were found at only one site, Angry Ridge, 42SA5485.

Kana-a Gray was found at almost all sites. Similar to Kiet Siel Gray in its crudity, it has other distinguishing characteristics. Typically it is a plain gray ware, sand-tempered and usually with incompletely obliterated coils. Several sherds believed to be a variety of Kana-a Gray have been termed "Clapboard Corrugated." It appears to be basically Kana-a Gray with pronounced coils resembling the clapboards on a house. This type was found only at the Over Site, 42SA6214.

All of the above types were present in some quantity at the Over Site. Of all the sherds at the Over Site, 42SA6214, 52.2% of them were Tusayan Gray Ware. Site 42SA740 contained a fairly large sampling of each type also with the exception of the "Clapboard Corrugated." Tusayan Gray Wares make up 36.4% of the sherds at this site. Angry Ridge, 42S5485, contained 15.1% Tusayan Gray

Figure 97. Grey Ware sherds. Tusayan Corrugated, a, c and e; Kana-a Grey Ware, b; "Clayed-Over Ware," d.


a
b
c
d
0
5 Cm.


e
0
5 Cm

Ware of which only Tusayan and Moenkopi are represented. At Rappel Ruin, 42SA683, only Moenkopi and Tusayan Corrugated were present. The remaining sites, 42SA533, 42SA511, 42SA684, 42SA5379, 42SA5486, contained only small collections of ceramics. Of those only 42SA551, 42SA553, 42SA5379, 42SA6317 contained examples of Tusayan Gray Ware.

TUSAYAN WHITE WARE (Fig. 98 g)

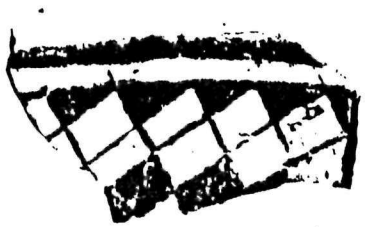
Because of the high degree of weathering to the sherds there is a high count of unidentifiable white ware sherds. Many of these sherds are so badly weathered that the design elements cannot be recognized, thus the sherds cannot by typed.

In addition to the unidentifiable white ware sherds there were four recognizable types, two of which occur characteristically during PIII times, Kayenta Black-on-White and Tusayan Black-on-White. Kayenta Black-on-White has the distinctive "Mosquito bar" design. The other two types, Black Mesa Black-on-White and Flagstaff Black-on-White, carry design elements that are characteristic over a broad time range. Black Mesa Black-on-White has several different design elements while Flagstaff Black-on-White has a few unique elements. Besides differing from the Mesa Verde White Ware in temper, Tusayan White Ware has a very thin white wash on the surface rather than the heavy, white wash common to the Mesa Verde White Ware.

The Over Site, 42SA6214, contains the highest percentage of Tusayan White Ware of all the sites, but not the largest number of total sherds. Of the 662 sherds found at 42SA6, only 81 sherds or 12.2% are Tusayan White Ware. This site contains a large number of Tusayan and Kayenta Black-on-White but no Black Mesa Black-on-White. Site 42SA740 contains a representative sample of each of the four identifiable types. Tusayan White Ware made up 10.7% of the 1,139 sherds from 42SA740. The only other site to contain sherds of a Tusayan

Figure 98. Tusayan and Mesa Verde White ware sherds

a



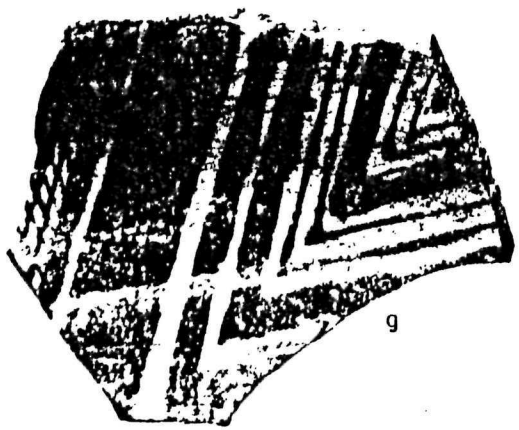
b

c

d

e

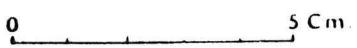
f



g

h

i



White Ware type was Carols House, 42SA5379, which contained one sherd of Black Mesa Black-on-White.

TSEGI ORANGE WARE (Fig. 99a, c)

In addition to the five types of Tsegi Orange Ware, there are a large number of unidentifiable sherds of this ware. These have been labeled as unidentifiable in the provenience chart and include those sherds that are so weathered that design elements cannot be distinguished, and those sherds that are too small and do not have any design but are clearly not of the plain Tsegi Orange type. One of the five types present, Tsegi Orange, is a plain orange ware containing no design elements and no outer wash of any kind. Particularly apparent is the distinctive sherd temper of the Tsegi Orange Ware.

Only one black-on-red variety was evident—Tusayan Black-on-Red, with the familiar hachured designs. Two polychrome varieties were recovered—Citadel Polychrome and Tusayan Polychrome. Both have characteristic design elements, one with very bold lines and the other containing hachured elements in addition to the basic design. Present in a minor amount was Tsegi Red-on-Orange. Elemental red designs were placed on the orange pottery to produce the desired effect.

The unidentified orange ware was the most common of all the sherds present. At the Over Site, 42SA6214, 19.9% of the sherds were Tsegi Orange Ware types. Site 42SA740 had 6.5%, while 42SA5485 had 6.3%. None of the other sites visited in 1977 contained Tsegi Orange Ware sherds.

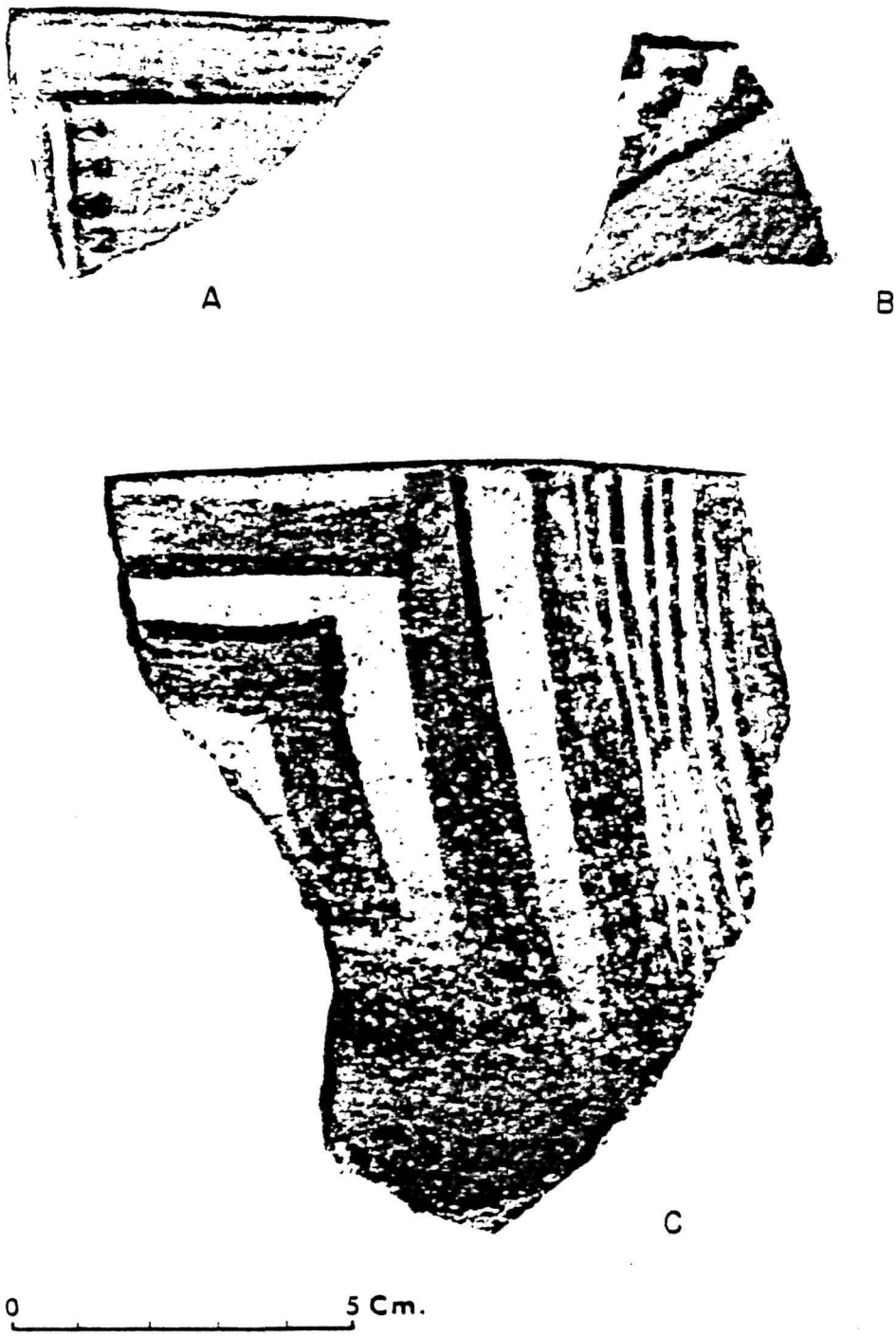


Fig. 99 Tsegi Orange Ware and San Juan Redwave sherds.
Tsegi Orange Ware: Tusayan Polychrome, a, Citadel Polychrome, c. San Juan Redware: Abajo Polychrome, b.

MESA VERDE-SAN JUAN WHITE WARE (Fig. 98 a-f, h, i)

Only two types of white wares that were not of Kayenta origin were found. Based on design elements and surface treatment, sherds were categorized into two types—Mancos Black-on-White and McElmo-Mesa Verde Black-on-White. Mancos Black-on-White had a surface treatment different from the Mesa Verde white ware. They did not have the dead white appearance of the Mesa Verde wares and the black designs were not of a similar quality as the McElmo-Mesa Verde Black-on-White sherds. Design elements were characteristically different, which gave rise to two distinct types—one a Mesa Verde White Ware and the other a San Juan White Ware. Because there were no complete or wholly restorable vessels present, the Mesa Verde and McElmo Black-on-Whites have been combined into one type in the 1977 Lake Powell collection. These two types are generally only distinguishable when complete vessels are found.

A great portion of Mesa Verde-San Juan White Ware sherds were unidentifiable—69% (49) at the Over Site (42SA6214) and 58.6% (216) at 42SA740. Although extensive weathering had taken place, these sherds were identified as Mesa Verde-San Juan because of their general appearance and temper; some had a noticeable white wash with unidentifiable designs present.

Site 42SA740 contained the greatest percentage of Mesa Verde type white wares with 32% of the total sherds. The Over Site, 42SA6214, had 10.7% Mesa Verde types. Site 42SA533 had only one McElmo-Mesa Verde Black-on-White sherd, as did 42SA683. Site 42SA5485 contained six sherds, five of them unidentifiable, and the remaining sherd was a Mancos Black-on-White. Site 42SA551 had one unidentifiable sherd; 42SA5486 had two unidentifiable sherds; and Carol's House, 42SA5379, had two Mancos Black-on-White sherds, one McElmo-Mesa Verde Black-on-White, and four unidentifiable sherds.

SAN JUAN RED WARE (Fig. 99b)

Only two types of San Juan Red Ware were found, and only in minor amounts. A grand total of six Abajo Polychrome sherds was found at the Over Site, 42SA6214. Two sherds of Abajo Red-on-Orange were found at 42SA740. The remaining San Juan Red Ware sherds, a total of 14, were unidentifiable. Three of these were found at the Over Site, 42SA6214, while the other eleven were found at 42SA740.

MESA VERDE GRAY WARE

Only one sherd of Mancos Corrugated was found in 1977 at 42SA740.

NAVAJO UTILITY WARE

Thirty sherds of Navajo Utility ware were collected near 42SA551.

"CLAYED-OVER WARE" (Fig. 97d)

The term "Clayed-Over Ware" is purely a descriptive term denoting three sherds found in the midden of 42SA740, a predominantly Kayenta site. Their origin is unknown. Whether they are local wares, of either Kayenta or Mesa Verde origin, or they are trade wares is difficult to ascertain. The temper of these unusual sherds is a fine to medium sand with minor amounts of sherd temper that is generally unobtrusive. The vessel appears to have been a jar form. The inner surface and core are a dark-gray while the outer surface is a light reddish-brown. Clay of a darker brown color has been applied on the outer surface, presumably at the leather hard stage, giving it a "clayed-over" appearance. No other site visited in 1977 contained any of this type of pottery.

MOQUI CANYON

Of all the sites visited in Moqui Canyon in 1977 (Table 10, 11), only two, the Over Site (42SA6214) (Table 12) and 42SA740 (Table 13) had more than 100

pottery sherds. Eleven of the twelve previously excavated sites in the canyon had ceramic collections. These sites are listed in Table 14. Of these sites excavated during UCRBASP, six (42SA585, 42SA781, 42SA675, 42SA679, 42SA678 and 42SA736) had a greater predominance of Mesa Verde type ceramics. Two sites, 42SA729 and 42SA738, had a fairly equal proportion of Kayenta and Mesa Verde type ceramics. The remaining sites, 42SA681, 42SA576 and 42SA583, are predominantly of Kayenta ceramic tradition. Of those sites from which pottery was collected in 1977, two are of primary importance—42SA6214 and 740. The collections from these two sites provide enough data to make a statement on the ceramic traditions present. The two sites are roughly in the center of the canyon; seven of the previously excavated sites are east of the Over Site, 42SA6214, and 42SA740, toward the head of Moqui Canyon.

A few types dominate the ceramics in the Moqui Canyon. The number of sherds of each ceramic type of course, varied from site to site. It is more interesting to note the variation between the raw sherd counts and the number of types of each ware present. Though a site may have a high percentage of sherds of the Mesa Verde ceramic tradition, it may have meager number of types. It appears just the opposite with the Kayenta ceramics—a large variety of types was found. This holds true for most of the excavated sites in the canyon. There is a greater variety of Kayenta ceramic types in contrast to Mesa Verde types in the canyon, however, this is not necessarily reflected in a greater volume of sherds for those types.

Of all the possible wares, there is usually only one of each represented at each of the sites—Mesa Verde White Ware versus Tusayan White Ware, and so forth. Looking at the total picture, there are five types within the Tusayan Gray Ware, the Tusayan Gray Ware and Tusayan Corrugated, Moenkopi Corrugated, Kana-a Gray, Kiet Siel Gray, and Johnson Corrugated. Only Mancos Corrugated

Table 14. Cultural Affiliation of Excavated Sites in Moqui Canyon, downstream to upstream orientation.

Site Number	Site Name (Reference)	Cultural Affiliation
42SA576	Shady Alcove (Lipe et al. 1960)	Kayenta
42SA533	Steury Ledge (this report)	uncertain
42SA585	Doll Ruin (Lipe et al. 1960)	Mesa Verde
42SA583	Echo Cave (Lipe et al. 1960)	Kayenta
42SA683	Rappel Ruin (this report)	uncertain
42SA678	Copter Ledge (Sharrock et al. 1963)	Mesa Verde
42SA6214	Over Site (this report)	Kayenta
42SA738	Ivy Shelter (Sharrock et al. 1963)	Mesa Verde/Kayenta
42SA740*	(this report)	Kayenta
42SA679	Hiboy House (Sharrock et al. 1963)	Mesa Verde
42SA729	Flatrock House (Sharrock et al. 1963)	Mesa Verde/Kayenta
42SA675	Red Ant Kiva (Sharrock et al. 1963)	Mesa Verde
42SA681	Rehab Center (Sharrock et al. 1963)	Kayenta

*This unnamed site was not excavated, only surface collected

Table 14 — Continued

Site Number	Site Name (Reference)	Cultural Affiliation
42SA781	Tamarix Dune (Sharrock et al. 1963)	Mesa Verde
42SA736	Bernheimer Alcove (Sharrock et al. 1963)	Mesa Verde
42SA754	Honeycomb Alcove (Sharrock et al. 1963)	uncertain

and Chapin Gray are present from the Mesa Verde traditions. Both the previous and recent excavations contain all these types with the exception of Kana-a Gray which was found only in the 1977 excavations. Johnson Corrugated and Chapin Gray, which were found in previous excavations, were not found in 1977. Both 42SA740 and the Over Site (42SA6214) were primarily Kayenta and they contained only one Mesa Verde sherd between them.

Similarly, there were more types of Tusayan White Ware than of Mesa Verde White Ware. Style and design elements were primarily restricted to Kayenta Black-on-White, Tusayan Black-on-White and Flagstaff Black-on-White, with some Sosi-Dogoszhi and Black Mesa design elements. Although only two types of the Mesa Verde-San Juan White Ware type were present, they occurred in great numbers at the sites. Even though a site may have been Kayenta, on a percentage basis there were consistently more sherds in the Mancos and McElmo-Mesa Verde Black-on-White types than in any one of the Kayena Black-on-White types.

Kayenta Red Ware types also outnumbered the San Juan Red Wares. Within the Tsegi Orange Ware series, seven types were found. Of the San Juan Red Ware category, only five types were recorded.

Consistency among ceramic types found at all sites, both Kayenta and Mesa Verde is clear. Basically certain types are prevalent among the ceramics found in Moqui Canyon, though the number of sherds in each type may differ from site to site. It is perhaps of some importance that Kana-a Gray and the Abajo Reds were not present in UCRBASP excavations, while Chapin Gray and Mancos Corrugated were not found extensively in 1977. Those sites previously excavated by UCRBASP were of a Mesa Verde ceramic tradition while the 1977 sites were Kayenta, which could account for the presence of Kana-a Gray in Kayenta and Chapin Gray in Mesa Verde sites. Both types are utilitarian gray

wares present over a broad time span. In fact, one may be considered the regional counterpart of the other. The lack of certain San Juan Red Ware types in the 1977 collection may be explained by the large number of unidentifiable sherds.

It has been theorized in previous publications on Moqui Canyon (Lipe et al. 1960, Sharrock et al. 1963) that the Kayenta peoples were concentrated downstream while the Mesa Verde peoples predominated upstream. This assumption was based on ceramic collections in the canyon. Upon examination of the graph in Sharrock et al. (1963:24-25), in which percentages of Mesa Verde and Kayenta ceramics are plotted in relation to site location on an east to west (or upstream to downstream) basis, it appears that there is a slightly greater predominance of Mesa Verde upstream and Kayenta downstream. Although several fluctuations are exhibited, the graph does not show a gradual or steady trend in either direction.

In previous reports, the data was deemed inconclusive in determining the dividing line between Mesa Verde and Kayenta geographic affiliations. The addition of data from 42SA740 and the Over Site (42SA6214), both Kayenta by ceramic affiliation, does not seem to generate conclusive evidence (Table 14). Although there appears to be a heavy Kayenta occupation near the mouth of Moqui Canyon, with an equally weighty Mesa Verde occupation farther east, the trend from Kayenta to Mesa Verde occupation is not gradual or consistent. There are many sites with predominantly Mesa Verde ceramics amidst an area of predominantly Kayenta sites, and vice versa.

Sharrock et al. (1963) hypothesize that Mesa Verdeans had entered Moqui Canyon via the headwaters and then proceeded to either settle down or move westward. Upon moving westward, they encountered Kayentans migrating eastward from the mouth of the Canyon. Two reasons for heavy Kayenta

influence near the mouth of canyon were given. One reason was that the upper two-thirds of the canyon had already been occupied by Mesa Verdeans; and the other was that the headwaters were farther away from the geographical center of Kayenta culture. However, the presence of the Over Site, 42SA6214, and 42SA740 do not support this hypothesis. Both sites are located in the middle of the canyon and both are decidedly Kayenta. Thus if, as Sharrock et al. postulate, the dividing line between Kayenta and Mesa Verde populations crosses through Moqui Canyon. The location of the line must be moved farther to the east.

A closer look at the pottery from sites in Moqui Canyon does not support the idea of separate "populations" of "Kayenta" and "Mesa Verde" people, nor does it support the migration hypotheses presented by Sharrock et al. Although the sherd counts of ceramic types differ from site to site, the same basic types are found at each site. The raw frequency counts of Mesa Verde and Kayenta types are highly correlated (i.e., they are found at certain predictable ratios at every site). Perhaps the reason that both Mesa Verde and Kayenta types are found at a particular site is that ceramics from both "cultures" were available and that the local inhabitants were selecting particular ceramic types on the basis of functional or aesthetic criteria.

From Table 14 it is clear that there is no upstream to downstream differentiation in basic ceramic affiliation, and the fact that the ratio between Kayenta and Mesa Verde types is predictable at sites in Moqui Canyon clearly indicates that percentages of ceramic types cannot be used to identify cultural or regional affiliation.

LAKE CANYON

One site in Lake Canyon excavated in 1977, Angry Ridge (42SA5485, Table 15) produced limited ceramic collection. At 42SA551, a surface collection of ceramics was made which yielded 33 sherds, 30 were typed as Navajo Utility

Table 15. Pottery Provenience at Angry Ridge (42SA5485, Lake Canyon)

	Fill, Structure 1	Fill, Structure 2	Surface	Total
Tusayan Gray Ware				
Tusayan Corr.		3	1	4
Moenkopi Corr.			8	8
Kana-a Grey				—
Kiet Siel Grey				—
"Clapboard Corr."				—
O'Leary Tooled	23			23
Tusayan White Ware				
Tusayan B/W				—
Kayenta B/W				—
Flagstaff B/W				—
Black Mesa B/W				—
Unidentified				—
Tsegi Orange Ware				
Tusayan B/R	1			1
Tsegi Orange				—
Tusayan Poly				—
Citadel Poly.	2			2
Tsegi R/O	1			1
Unidentified			1	1
Mesa Verde White Ware				
Mancos B/W			1	1
McElmo-Mesa Verde B/W				—
Unidentified			5	5
San Juan Red Ware				
Abajo R/W				—
Abajo Poly.				—
Unidentified				—
Mesa Verde Gray Ware				
Mancos Corr.				—
"Clayed-over Ware"				—
Unidentified	15	9	9	33
TOTAL	42	12	9	79

Ware. The remaining three sherds were Anasazi; one was a Kana-a Gray sherd and the remaining two could only be identified to ware.

In 1977, Angry Ridge (42SA5485) was the only site to produce sherds of the type O'Leary Tooled of the Tusayan Gray Ware. Twenty-three were found in the fill of Structure I. The remaining 56 sherds were divided between the Tusayan Gray and White Wares, Tsegi Orange Ware and Mesa Verde-San Juan White Ware, showed a strong predominance of Kayenta sherds.

There are problems dividing the Kayenta and Mesa Verde Anasazi sites in Lake Canyon based on pottery (Sharrock et al. 1963), just as in Moqui Canyon. There appears to be a predominance of Mesa Verde sites to the north in the headwaters region while Kayenta predominance is to the south. The pottery collections from 1977 do not seem to shed any more light on the problem.

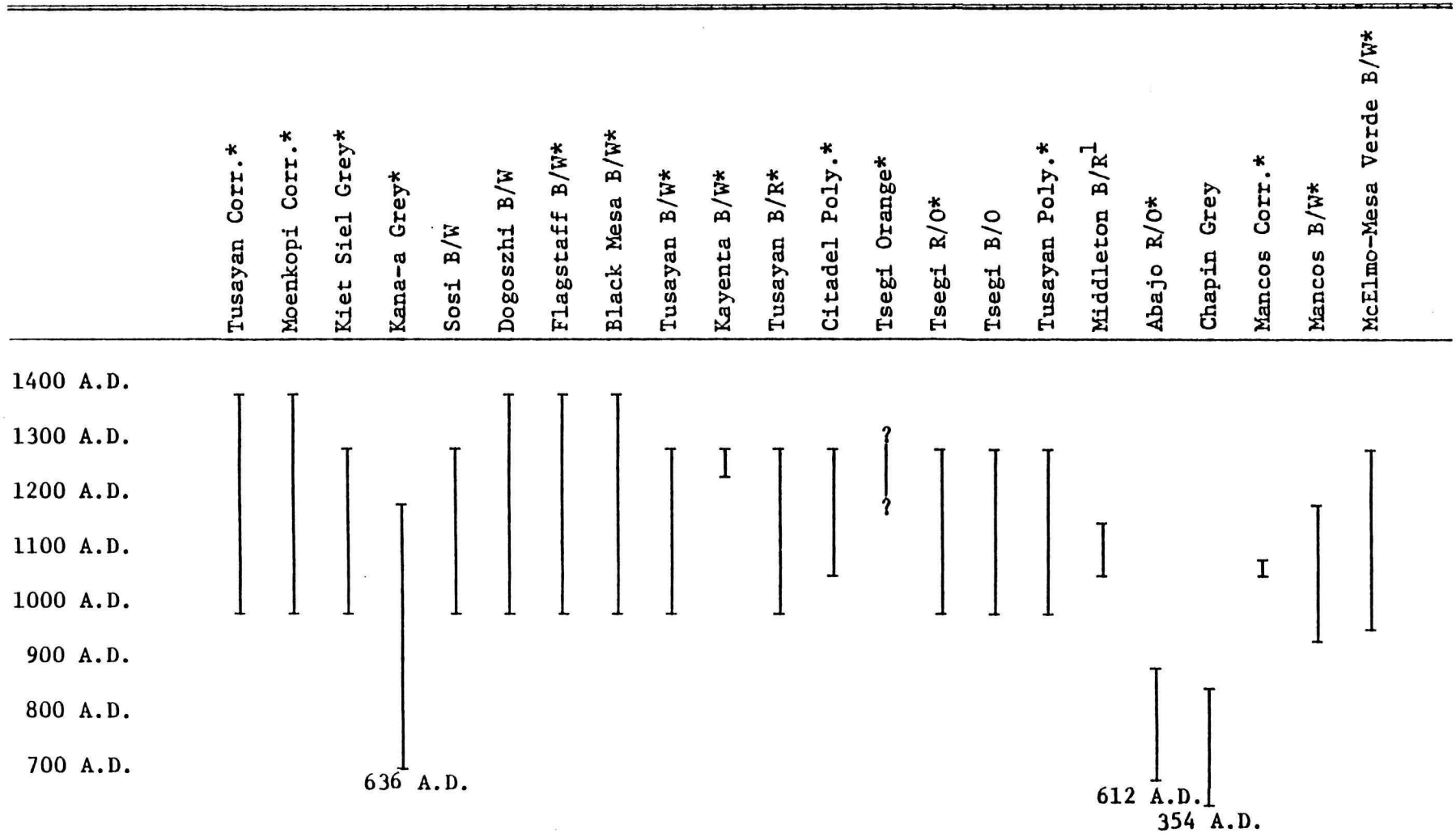
GYPSUM CANYON

Only one site in Gypsum Canyon yielded pottery. Carol's House, 42SA5379, contained fourteen sherds, about half Mesa Verde types and half Kayenta types with two unidentifiable sherds. The Mesa Verde type sherds were exclusively black-on-whites while there were both Kayenta Gray Wares and black-on-white sherds.

CHRONOLOGY

A wide range of dates accompany the ceramic types found in 1977. Breternitz's (1966) work on tree-ring dated pottery was the primary reference for the dates used here. When dates were not available from Breternitz, Colton's (1955) dates were used. Looking at the dates as a whole, rather than from site to site, there is a general consistency in time range (Fig. 100). Two utility wares, Chapin Gray and Kana-a Gray have dates much earlier than the remaining types. It is generally believed that these types are "utility" wares and were used more

Figure 100. Chronological Chart of Ceramic Types



*Types recovered in 1977
[1]This type dated from Colton (1955), all others from Breternitz (1966)

or less continuously after their inception, thus they are practically undatable. In order to individually date sites, an examination of ceramic types found there will follow.

Moqui Canyon

OVER SITE (42SA6214) (TABLE 12) AND 42SA740 (TABLE 13). At these two sites most of the 1977 pottery sherds were found. Since the majority of the dates for the types are consistent with each other the presence of one or two types with the shortest time span is the most accurate type for dating. Most of the types have a starting date of around A.D. 1000 and a concluding date of around A.D. 1300, though some of the Tusayan Gray and White Wares extend until A.D. 1400. Two types, Tsegi Orange and Kayenta Black-on-White, appear solely in the 1200's. Kayenta Black-on-White, having the shorter time span, is usually considered an ideal time marker. Beginning around A.D. 1250 and ending around A.D. 1300, the presence of Kayenta Black-on-White dates these sites at around A.D. 1250-1300.

STEURY LEDGE (42SA533) (TABLE 10). It is difficult to date this site since only three sherds were found here, two Tusayan Gray Wares with dates ranging from A.D. 977 to A.D. 1390, and one McElmo-Mesa Verde Black-on-White with a date from A.D. 957 to A.D. 1275. This site could have been occupied anywhere from around A.D. 1000 to probably not later than A.D. 1250.

RAPPEL RUIN (42SA683) (TABLE 11). Several more sherds were found here than at Steury Ledge. Again, these are primarily Tusayan Gray Ware sherds with a long time span. Only one Mesa Verde White Ware sherd was found. Three unidentifiable Tsegi Orange Ware sherds were present which limits the site to not later than A.D. 1300. The earliest dates start around A.D. 950 or A.D. 975, thus giving the site an occupation anywhere from A.D. 950 to A.D. 1300.

SITE 42SA684 (TABLE 10). Only one sherd of the Tusayan Corrugated type was found at the site, the occupation could date anytime from around A.D. 975 to around A.D. 1400.

SITE 42SA5486 (TABLE 10). Two sherds, both unidentifiable Mesa Verde-San Juan White Ware sherds were found, giving the site a possible occupation date of A.D. 900 to A.D. 1275.

SITE 42SA6317 (TABLE 10). Two Kiet Siel Gray sherds were found at this site, allowing a prehistoric occupation anytime from around A.D. 975 to around A.D. 1300.

Reviewing the ceramic types and dates given in previous publications (Sharrock et al. 1963) concerning the previously excavated sites in Moqui Canyon, it is apparent that all were roughly contemporary. Both the 1977 work and the previous excavations fall within P-III dates. The majority of sites excavated in 1961 contain Kayenta Black-on-White sherds limiting them to the 1200s—the same time limit for 42SA740 and the Over Site (42SA6214). The remaining sites visited in Moqui Canyon in 1977 have such a small sherd count that it is impossible to date them other than in the P-III time period.

Lake Canyon

ANGRY RIDGE (42SA5485) (TABLE 15). Sherds from each of the wares, with the exception of the San Juan Red Ware and Tusayan White Ware, are found at 42SA5485. Since the Tusayan Gray Ware has such a broad time range the two time marker types at this site would be the Tsegi Orange Ware and the Mesa Verde-San Juan White Ware. With an upper limit of A.D. 1300 and a maximum lower limit of A.D. 900, the site was probably occupied sometime around A.D. 1200. The earliest dates for Tsegi Orange are somewhat vague, probably originating around A.D. 1200 (A.D. 1250 for Colton), which suggests an occupation at Angry Ridge sometime later.

SITE 42SA551 (TABLE 10). The three Anasazi sherds found at this site allow an occupation anytime between A.D. 1000 and A.D. 1400. The presence of 30 sherds (probably all from one vessel) of Navajo utility ware indicate that there was a relatively late protohistoric or historic occupation in the canyon. This is supported by the presence of several historic sites in the canyon.

Gypsum Canyon

CAROLS HOUSE (42SA5379) (TABLE 10). Those sherds in the Tusayan White and Gray Wares found at 5379 are of a type beginning around A.D. 1000 and ending fairly late—around A.D. 1400. The few sherds belonging to the Mesa Verde-San Juan White Wares limit the occupation of the site to probably no later than A.D. 1300; though only an early occupation date of around A.D. 1000 can be given.

Organic Artifacts

by

Peggy Barnett

With the exception of charred plant remains found in flotation samples, all of the organic artifacts were found in Moqui Canyon—most of them from three sites, Rappel Ruin (42SA683), the Over Site (42SA6214), and 42SA740. The organic artifacts can be divided into two groups: animal remains and plant remains. The animal remains consists of bone artifact, a single, poorly preserved, unidentifiable feather from 42SA6317, and a piece of skin.

ANIMAL REMAINS

Worked Skin

A piece of worked skin, composed of two parts looped together (Fig. 101a) was recovered from Rappel Ruin (42SA683). Identification of the animal species was uncertain, but it is possibly tanned deer hide based on small remaining patches of hair (Frank Hull, personal communication). The main piece of skin is slightly trapezoidal and measures appx. 9.5 cm. long, 6.3 cm. in width at the widest end, and 3.3 cm. in width at the narrowest end. A hole in the widest end has the second piece of skin looped through it and then the second piece is looped again through itself. The second piece is appx. 18.5 cm. long, slightly triangular at the wide end (which measure 4.2 cm.), and this end has a hole through which the narrower end is looped. The tapering narrow end's length has sewing holes punched in two rows starting appx. 5.2 cm. from its tip and continuing at irregular intervals to the end.

The pieces of worked skin may have been part of a larger artifact. Similar pieces have been found in previous Glen Canyon excavations (Lipe 1960).

Figure 101. Hide and cloth artifacts.

a

0 5 Cm.

b

0 5 Cm

BONE

Worked Bone

Worked bone artifacts consisting of one awl and two gaming pieces or "dice," were recovered at the Over Site (42SA6214) (Fig. 102). The smooth, polished awl is Type D, categorized by Lipe et al. (1960). The awl measures 7.2 cm. in length and tapers from 1.0 cm. at the head to 1 mm. at the point. It was not possible to identify the bone as to species. The gaming pieces, or "dice," are identified as parts of Artiodactyla bones. The two pieces are nearly identical in size and shape. Both are circular, flat, and vary from 1.5-1.7 cm. in diameter. Each has a smoothed, polished upper surface of what had been the exterior of the bone and the undersides still show the porous interior of the bone from which they were cut. The edges had been smoothed and flattened. The pieces are very similar to those described from Defiance House (42SA598) in Forgotten Canyon (Lipe et al. 1960:198).

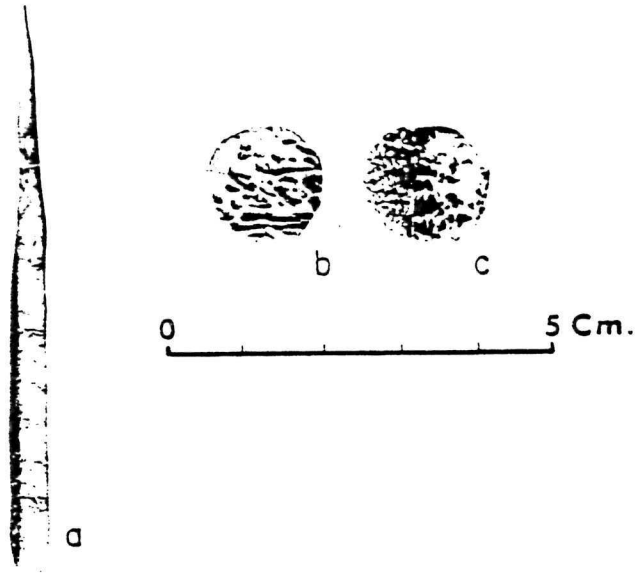
Unworked Bone

A total of 108 unmodified non-human bones were recovered from three sites in Moqui Canyon Rappel Ruin (42SA683), 42SA740, and the Over Site (42SA6214) (Table 16). The order of ungulate mammals which includes deer, antelope, sheep, bison and elk (Artiodactyla) was represented by 49% of the remains. The second largest amount of bone (46%) was unidentifiable. Following these categories the remaining identifications were: 3% for cottontails (Sylvilagus sp.); and 1% each for packrats (Neotoma sp.); bighorn sheep (Ovis canadensis); mule deer (Odocoileus hemionus); birds, lizards, and squirrels (Citellus sp.). Identification was based on comparisons with oesteological collections stored at the University of Utah.

The large percentage of Artiodactyla bones indicates at least a partial reliance on big-game hunting in addition to the prehistoric practice of horti

Figure 102. Worked bone artifacts awl, a; gaming disc, b, c.

Figure 103. Wrapped stick, a; and cradle board fragments, b.


a
b
c
0
5 Cm.

a
0
5 Cm.

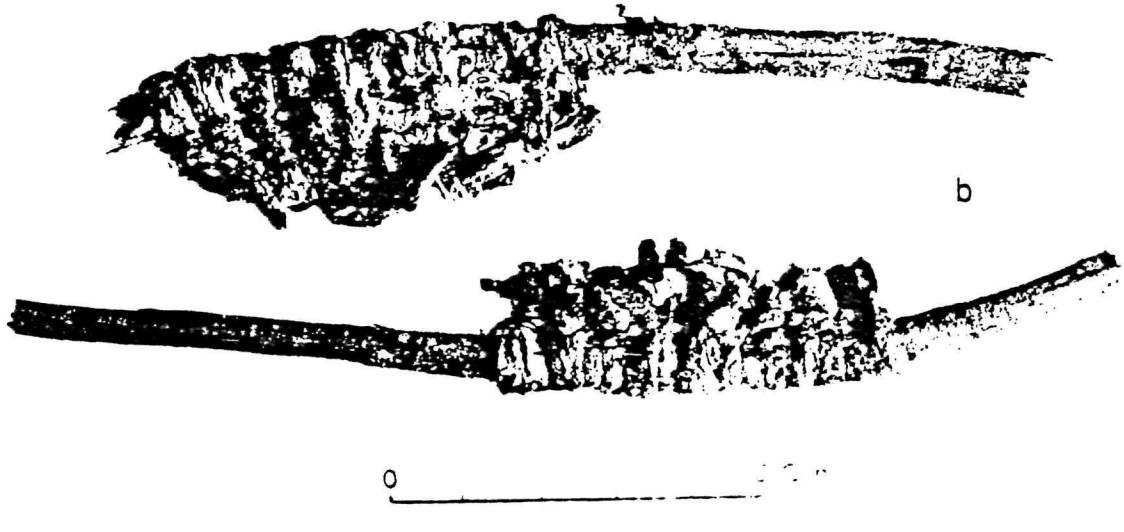

b
0

Table 16. Distribution of Unworked Bones by Site

	Artiodactyl	Cottontail	Bighorn Sheep	Bird	Lizard	Mule Deer	Packrat	Squirrel	Unidentified	Subtotals	Site Totals
Rappel Ruin (42SA683)											
Room 2	18									9	27
Room 4		1									1
Room 5	1				1				1	4	
Rat Midden	2		1	1			1		1	5	37
42SA740											
Surface	2								10	12	
Midden	8					1				9	21
Over Site (42SA6214)											
Room 2, Fill	1									1	
Room 3, Floor	4	2						1	10	17	
Midden A	2								11	13	
Midden B	13								1	14	
Surface	2								3	5	50
TOTAL											108

culture. The presence of cottontail (Sylvilagus sp.) remains at sites 42SA740 and the Over Site (42SA6214) may indicate the hunting of these species also, however, the lizard, squirrel, packrat and bird remains were probably intrusions.

A comparison with excavated sites in Moqui Canyon during the Glen Canyon Project years (Lipe et al. 1960, Sharrock et al. 1963) reveals a similarity between the recovered, unmodified animal bone remains in those excavations and the remains recovered during the field season of 1977. The major difference is in the variety of species and the total number of bones.

Neither the worked nor the unworked bone remains can provide conclusions as to dependence on any one species as food. The recovery of large amounts of corn remains and a small amount of squash and beans indicate a dependence on horticulture rather than hunting and gathering.

PLANT REMAINS

WORKED PLANT REMAINS

The distribution of worked plant remains is shown in Table 17.

CLOTH. One scrap of cotton cloth with a simple over-one under-one weave (Fig. 101b) was recovered from the fill of Room 6 at Rappel Ruin (42SA683). The main section is rectangular, measuring 9 cm. in length and 3.5 cm. in width, with a long ragged section measuring 24 cm. in length extending from one corner.

BASKETRY. Two sections of a burned, deteriorating cradle board(?) were recovered from the fill of Room 2 at Rappel Ruin (42SA683) (Fig. 103b). The frames, or osier rings, are rod foundations measuring .6-1.0 cm. in diameter. They have a simple twining of yucca fibers, with feathers or wool on one side of the weave. The first piece is 12.6 cm. long and, including fibers, appx. 3 cm. at its maximum width. The second piece is 15 cm. long and appx. 2.4 cm. at maximum width, including fibers.

Table 17. Distribution of Worked Plant Remains by Site

	Cloth	Basketry	Knotted yucca leaves	Yucca cordage (knotted)	Yucca cordage	Yucca fiber	Yucca and cotton cordage	Cotton	Quids	Wrapped stick
Rappel Ruin (42SA683)										
Room 1			2		2		1		5	
Room 2		1							1	
Room 4			3		4			1	2	1
Room 5			2	2					13	
Room 6	1									
Rat Midden			2			1			4	
42SA6317										
Structure fill			2							

KNOTTED YUCCA LEAVES. Two knotted yucca leaves, each tied with a square knot, were recovered from the fill of the structure at 42SA6317. The longer strand measures 34 cm. in length and the second piece is appx. 13 cm. long. Nine leaves, all tied with square knots, were recovered at Rappel Ruin (42SA683) from Rooms 1, 4, 5 and the rat midden. Lengths range from 7.5 cm. to 44.5 cm. Knots may have been part of ties or bindings used to suspend drying corn, as sandal ties, or for tying together roof beams (Lipe et al. 1960:214, Sharrock et al. 1963:214).

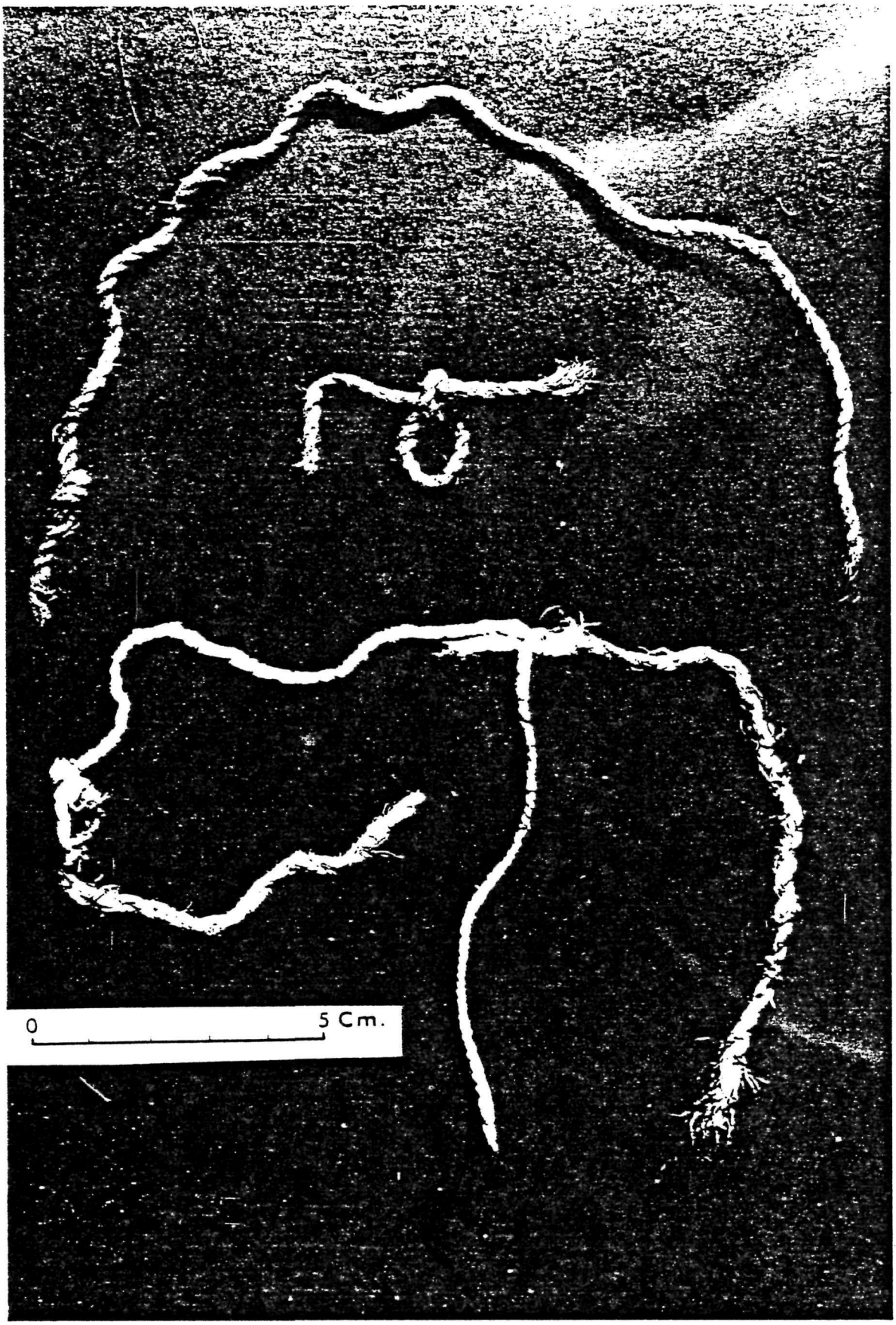
YUCCA CORDAGE. Eight lengths of two ply, Z-twist, yucca cordage (Fig. 104) were recovered from the fill of rooms 1, 4, and 5 and the rat midden at Rappel Ruin (42SA683). Two lengths recovered from room 5 were tied into knots, one with a square knot and the other with a sheet bend knot. Lengths ranged from 27.5 cm. to 10.5 cm. with thicknesses from appx. 2-7 mm.

YUCCA FIBER. A strand of yucca fibers measuring 22 cm. in length and tied with a single square knot appx. 1 cm. from one end was recovered from the fill of the rat midden west of room 5 at Rappel Ruin (42SA683).

YUCCA AND COTTON CORDAGE. Recovered in the fill of Room 1 at Rappel Ruin (42SA683) was a strip of two ply, Z-twist, yucca cordage, measuring 9.4 cm. in length, tied with a square knot to a strand of two ply, S-twist, cotton cordage measuring 11.1 cm. in length. Tied to the end of the cotton piece with a square knot is a second piece of two ply, S-twist, cotton cordage measuring 10.1 cm. in length and a piece of two ply, Z-twist, yucca cordage measuring 12.4 cm. in length.

COTTON. A single strand of cotton fiber measuring 7.5 cm. in length and from 3-4 mm. wide was recovered from the fill of room 4 at Rappel Ruin (42SA683).

Figure 104. Cordage, cotton and yucca.


0
5 Cm.

QUIDS. Twenty-five quids were recovered from the fill of Rooms 1, 2, 4 and 5 and from the fill of the rat midden west of Room 5 at Rappel Ruin (42SA683). The quids are thoroughly chewed wads of plant fibers. The general size ranges from appx. 1-6 cm. long and 1-3 cm. wide. Nineteen of the quids were identified as yucca fiber with the remaining six as corn leaves.

WRAPPED STICK. A stick of unidentified wood (Fig. 103a) that has been peeled and smoothed, measuring appx. 3 cm. in diameter and 16.4 cm. long, was recovered from the fill of Room 4 at Rappel Ruin (42SA683). Near one end of the stick, corn husks had been wrapped tightly in a criss-cross fashion around the stick.

Unworked Plant Remains

DOMESTICATED. Corn, squash, and beans (Table 18) were the domesticated plants recovered from sites in Moqui Canyon at Rappel Ruin (42SA683), 42SA684, 42SA740, 42SA6214, and 42SA6317. The most numerous remains were of corn, including cobs, husks, stalks, leaves, kernels, and male corn flowers. Corn was recovered at Rappel Ruin (42SA683) and 42SA684. Squash was the second most common domesticate found and was recovered from Rappel Ruin (42SA683), 42SA684 and 42SA6317. Only three beans and a possible bean pod were recovered at Rappel Ruin (42SA683). The domesticated plants have been analyzed by Robert Bye and the results are reported in Appendix V.

UNDOMESTICATED. Wild plant remains, (Table 18) collected from four sites in Moqui Canyon, Rappel Ruin (42SA683), 42SA684, 42SA740 and 42SA6214, included sticks (some burned on the ends), leaves, acorns, fruits, cactus parts, reeds, bark, and grass fragments.

The plants that were identifiable were: Datura metaloides L. (sacred datura), Opuntia sp. (prickly pear cactus), Phragmites sp. (common reed), Populus angustifolia James (narrow-leaf cottonwood), Populus fremontii S. Wats.

Table 18. Distribution of Unworked Plant Remains by Site

	Domesticated	Corn	Cobs	Ear	Husks	Kernels	Leaves	Male flowers	Stalks	Squash	Bean	Undomesticated	Datura metaloides (fruit)	Opuntia sp. (pad)	Phragmites sp.	Populus angustifolia (leaf)	P. fremontii (bark)	P. sp.	Quercus sp. (acorns)	Yucca sp. (leaves)	Grass	Unidentified
Rappel Ruin (42SA683)																						
Room 1		X	X			X	X		X	X			X	X	X				X	X	X	X
Room 2		X					X	X	X		X				X	X				X		X
Room 4		X	X				X		X	X			X		X				X	X		X
Room 5		X	X	X				X	X		X		X		X				X			X
Rat Midden		X	X		X		X		X					X	X			X	X	X		X
42SA684																						
Structures fill			X							X												
42SA740																						
Midden																	X					
Over Site (42SA6214)																						
Room 3, floor		X																		X		
42SA6317																						
Structure fill			X							X										X		

X = Present

(Fremont cottonwood), Populus sp. (poplar; cottonwood), Quercus sp. (oak), and Yucca sp. (yucca).

In addition to the wild plant remains collected during the field work, 43 bulk soil samples were collected for flotation processing for small plant macrofossil remains. The flotation technique used was a modification of the simple hand flotation method described by Helbaek (1969:385). A majority of the bulk samples, 22, were collected from four sites in Moqui Canyon, seven samples were collected in Dangling Rope Canyon, four samples from Angry Ridge (42SA5485) in Lake Canyon, and one sample from Carol's House (42SA5379) in Gypsum Canyon.

With the exception of Rappel Ruin (42SA683), all of the four other sites from which samples were collected are open sites; sites in which only charred plant remains would be expected to be found. Yet in almost all the samples, there were many uncharred plant remains which can only be attributed to modern intrusion.

Gypsum Canyon - Carol's House (42SA5379). A single flotation sample collected from the fill of the slab-lined hearth contained small bits of charcoal, but no seeds were recovered. The only plant parts present were uncarbonized stems and fiber from modern plants.

Lake Canyon - Angry Ridge (42SA5485). Plant macrofossils were found in only two of the four samples collected at this site. A seed and plant part of grass (Gramineae) as well as a fruit of the netleaf hackberry (Celtis reticulata) were found in a sample taken from the hearth in Structure 1. Parts of grasses were also recovered in the sample taken in Structure 2, as well as seeds of the mustard family (Cruciferae), the portulaca family (Portulacaceae), and of the species Whitestem Blazingstar (Mentzelia albicaulis). No plant remains were recovered from the sample collected from the hearth in Structure 2. While all of

the samples contained pieces of charcoal, none of the seeds or plant parts were carbonized, they are probably recent.

Dangling Rope Canyon. Bulk samples were collected from four sites in this canyon. Almost all of the recovered remains represent uncharred plant materials and are probably recent intrusions, and not evidence of prehistoric plant utilization.

Moqui Canyon - Steury Ledge (42SA533). Two flotation samples were collected from Steury Ledge; one from the hearth in Structure 1, the second from the hearth in Structure 2. No seeds of plant parts were recovered from either sample.

Moqui Canyon - Over Site (42SA6214). Thirteen samples were collected from within the rooms and associated fire areas. The majority of plant parts recovered during the analysis were uncarbonized and were probably modern intrusions that occurred during the deposition of the fill of the rooms and surrounding areas.

Moqui Canyon - Rappel Ruin (42SA683). The bulk samples collected at Rappel Ruin consisted of two samples from the rat midden and two samples from Room 2. These samples contained the greatest variety of seeds from all samples collected in 1977. Also recovered in the samples were carbonized pieces of corn cob and unburned squash seed.

Even though the rat midden samples must contain seeds that were carried in by rodents, many are obviously those brought to the site by prehistoric inhabitants, including the corn and squash.

Summary. The majority of the taxa recovered from the flotation samples do not compare with the present vegetation near the sites. Many of the taxa, however, have been recovered archeologically from other sites in Glen Canyon (Clark 1966). The taxa recovered during the 1977 season are listed in Table 19.

Table 19. Inventory of Plants from Glen Canyon Sites (Recovered from Flotation Samples)

Plant	Lake Canyon		Moqui Canyon			Dangling Rope Canyon				Gypsum Canyon	Total # of Occurrences in all Sites
	Angry Ridge 42SA5485	Steury Ledge 42SA533	Rappel Ruin 42SA683	42SA740	Over Site 42SA6214	42KA1705	42KA[illegible]06	42KA1708	42KA1709	Carol's House 42SA5379	
ASCLEPIADACEAE (milkweed family)											
Asclepias sp. (milkweed)					X						1
BETULACEAE (birch family)											
Betula occidentalis Hook. (water birch)			X	X							2
BORAGINACEAE (borage family)				X							1
Cryptantha cf. micrantha Torr. (cryptantha)					X						1
CACTACEAE (cactus family)			X*								1
CAPPARIDACEAE (caper family)											
Cleome sp. (beeplant)			X*								1
CHENOPODIACEAE (goosefoot family)	X		X*		X			X*			4
Atriplex Garrettii Rydb. (saltbush)			X	X	X						3
A. sp. (saltbush)					X						1
Chenopodium fremontii Wats. (Fremont goosefoot)			X*								1
C. sp. (goosefoot)			X*		X*			X*			3
Corispermum hyssipfolium L. (bugseed)			X								1
Cycloloma atriplicifolium [Spreng] Coult. (winged pigweed)			X*		X*						2
COMPOSITAE (sunflower family)											
Artemisia sp. (sagebrush)						X*					1
Aster sp. (aster)			X								1
Chaenactis sp.					X						1
CRUCIFERAE (mustard family)					X						1
Descurainia sp. (tansy mustard)					X						1

Plant	Lake Canyon		Moqui Canyon			Dangling Rope Canyon				Gypsum Canyon	Total # of Occurrences in all Sites
	Angry Ridge 42SA5485	Steury Ledge 42SA533	Rappel Ruin 42SA683	42SA740	Over Site 42SA6214	42KA1705	42KA1706	42KA1708	42KA1709	Carol's House 42SA5379	
CUPRESSACEAE (cypress family)											
Juniperus oesteosperma [Torr.] Little (Utah juniper)			X*								1
J. scopulorum Sarg. (Rocky Mountain juniper)			X								1
CYPERACEAE (sedge family)											
Eleocharis sp. (spike rush)			X*		X						2
Scirpus maritimus L. (alkali bulrush)			X*		X*						2
EUPHORBIACEAE (spurge family)											
Euphorbia serpyllifolia Pers. (thymeleaf spurge)					X						1
GRAMINEAE (grass family)	X		X	X	X*	X*	X	X			7
Agropyron sp. (wheatgrass)				X							1
Agrostis sp. (bentgrass)			X								1
Bromus sp. (bromegrass)				X							1
Elymus canadensis L. (Canada wildrye)			X								1
Hilaria Jamesii [Torr.] Benth., (galleta grass)								X			1
Hordeum sp. (barley)			X*								1
Oryzopsis hymenoides [Roem. & Schult.] Ricker (Indian ricegrass)			X*			X*					2
Panicum capillare L. (witchgrass)			X								1
Phragmites sp. (common reed)			X								1
Sporobolus sp. (dropseed)	X				X						2
LOASACEAE (blazingstar family)											
Mentzelia albicaulis Dougl. ex Hook (whitestem blazingstar)	X				X						2
M. sp. (blazingstar)				X							1

Plant	Lake Canyon		Moqui Canyon			Dangling Rope Canyon				Gypsum Canyon	Total # of Occurrences in all Sites
	Angry Ridge 42SA5485	Steury Ledge 42SA533	Rappel Ruin 42SA683	42SA740	Over Site 42SA6214	42KA1705	42KA1706	42KA1708	42KA1709	Carol's House 42SA5379	
POLYGONACEAE (buckwheat family)											
Eriogonum sp. (wild buckwheat)	X										1
PORTULACACEAE (purslane family)					X*						1
ULMACEAE (elm family)											
Celtis reticulata Torr. (netleaf hackberry)	X		X					X	X		4
CORN			X*								1
SQUASH			X*								1

X - Present
* - Charred

With the exception of Rappel Ruin (42SA683), the scarcity of macrofossils reveals nothing of the use of wild plants by the prehistoric people. At Rappel Ruin, however, the large numbers of corn cobs and wild plants may indicate a reliance on both.

Chipped Stone

by

Dennis G. Weder

From Dangling Rope Canyon, which lies in Kane County, Utah, a total of 11,394 lithic artifacts were recovered; 98% was debitage. The remaining sites that were visited in 1977 and from which lithic artifacts were collected are all in San Juan County, Utah. Six sites in Moqui Canyon produced 1,542 lithic artifacts. In Lake Canyon, 23 lithic artifacts were recovered from 42SA551 and 70 from Angry Ridge (42SA5485). Carol's House (42SA5379) in Gypsum Canyon produced a total of 70 lithic artifacts. A total of 1,648 individual lithic artifacts were collected from the San Juan County sites.

Dangling Rope Canyon

Dangling Rope benchland is a large lithic scatter with several local concentrations (see "DANGLING ROPE CANYON"). For the purpose of this analysis all of the "sites" have been grouped together to facilitate discussion of the lithic artifacts found there.

The Dangling Rope benchland is an Archaic biface manufacturing station. The predominance of soft hammer debitage, prevalence of biface blanks and preforms, low incidence of wear polish on knives and the scarcity of utilized flakes and other tools indicate that biface manufacturing was the primary activity performed at Dangling Rope.

Although the majority of tools were blanks and preforms, the typical Archaic lithic tool assemblage was represented (See Table 20). In addition to the blanks and preforms, the following tool types were also present: utilized flakes, hammerstones, cores, scrapers, awls, gravers, and projectile points. Even though the number of projectile points was limited, a sufficient variety of recognized

Table 20. Distribution of Lithic Artifacts in Dangling Rope Canyon by Grid Units

Field Specimen Lot Number*	Debitage		Blanks	Preforms	Knives	Projectile Points	Utilized Flakes	Hammerstones	Cores	Scrapers	Drills/Awls/Gravers	Smoother
	Number	Weight										
1												
2	114	287	3	1	2			2				
3												
4	179	295						1	1	1		
5	1210	1186	1	3		1			2	1		
6	1078	1253	1	1			4	2	1	1		
8												
9	811	1121	4	3	2		3	2	1	1		
10	61	66		1				1				
11	4	12										

*Missing FS lot numbers were assigned to other samples

Table 20 — Continued

Field Specimen Lot Number*	Debitage		Blanks	Preforms	Knives	Projectile Points	Utilized Flakes	Hammerstones	Cores	Scrapers	Drills/Awls/Gravers	Smoother
	Number	Weight										
12	1827	2314	1	5	2	1	9	4	2	1	2	
13												
14	42	52										
15	164	201		1	1		1	2				
16	63	227		1			2	1		1		
17	5	6										
18	19	74	1									
19	14	23										
20	23	41		2					1			
21	2	16					1					
22	18	54										

*Missing FS lot numbers were assigned to other samples

Table 20 — Continued

Field Specimen Lot Number*	Debitage		Blanks	Preforms	Knives	Projectile Points	Utilized Flakes	Hammerstones	Cores	Scrapers	Drills/Awls/Gravers	Smoother
	Number	Weight										
23	9	9						1				
24	833	1098	3	1	2	2	2	1	1			
27	21	71		1		1	3					
28	20	82		1				1	1			
29	6	17								1		
30	1	1										
31	4	6										
32	122	148	1									
33	37	67				1						
34	47	46		2								
35	3	3				1						

*Missing FS lot numbers were assigned to other samples

Table 20 — Continued

Field Specimen Lot Number*	Debitage		Blanks	Preforms	Knives	Projectile Points	Utilized Flakes	Hammerstones	Cores	Scrapers	Drills/Awls/Gravers	Smoother
	Number	Weight										
36	13	56										
37	137	273		1					2			
38	342	266					1	2				
39	279	217		2	1	2						
40	5	16										
41	34	31										
42												
43	120	364		1		1						
44												
45	144	131										
46	68	81										

*Missing FS lot numbers were assigned to other samples

Table 20 — Continued

Field Specimen Lot Number*	Debitage		Blanks	Preforms	Knives	Projectile Points	Utilized Flakes	Hammerstones	Cores	Scrapers	Drills/Awls/Gravers	Smoother
	Number	Weight										
47	200	269	1	2				1		1		
48	16	19					1					
49	89	62					1					
50	267	348	2				1		1	1		
51	99	112			1		1					
52	1	2										
53	159	137		1	2		1	1	1			
54	163	192					1					
55	267	328					2	2				
56	14	12										
57	115	147				1			1			

*Missing FS lot numbers were assigned to other samples

Table 20 — Continued

Field Specimen Lot Number*	Debitage		Blanks	Preforms	Knives	Projectile Points	Utilized Flakes	Hammerstones	Cores	Scrapers	Drills/Awls/Gravers	Smoother
	Number	Weight										
58	163	171										
59	237	287	1	1			1					
60	51	55			1		1					
61	5	7								1		
62	100	108						1		1		
63	103	184		1			3		1	1		
64	204	191		1			2		2			
65	36	34								1		
66	79	68	1					1				
67	2	3										
68	7	15										

*Missing FS lot numbers were assigned to other samples

Table 20 — Continued

Field Specimen Lot Number*	Debitage		Blanks	Preforms	Knives	Projectile Points	Utilized Flakes	Hammerstones	Cores	Scrapers	Drills/Awls/Gravers	Smoother
	Number	Weight										
69	6	22							1			
70	127	251		2								
71	3	2				1						
72	22	31					1					
73	7	9										
74	7	4										
75	3	3										
76												
77	155	247							1			
78	18	13										
79	1	1										

*Missing FS lot numbers were assigned to other samples

Table 20 — Continued

Field Specimen Lot Number*	Debitage		Blanks	Preforms	Knives	Projectile Points	Utilized Flakes	Hammerstones	Cores	Scrapers	Drills/Awls/Gravers	Smoother
	Number	Weight										
80	25	39		1								
81	493	451		2			4	2				
82	1	1										
83	71	125	1			1						
84												
88	1	1										
TOTAL	11,196	14,162	21	38	14	14	50	27	17	12	2	1

*Missing FS lot numbers were assigned to other samples

types were identified to enable the Archaic cultural association of the site to be made.

BIFACE MANUFACTURING SEQUENCE

Three commonly recognized flint knapping techniques, hard hammer, soft hammer, and pressure retouch (Crabtree 1967) were used at Dangling Rope. Each of these three knapping techniques are recognizable on the biface tools and in the resulting debitage.

The hard hammer technique involves the utilization of a hard object, generally a stone, to strike the tool in order to remove flakes. Because of the unyielding nature of the stone hammer, the force of the blow is concentrated on a small area and the resulting flakes exhibit a pronounced bulb of percussion. The edge of a biface shaped with a hard hammer is therefore undulating and irregular.

The soft hammer technique involves the use of a baton of wood or antler (Crabtree 1970). Since the baton is softer than the chert biface, the edge of the biface will penetrate the edge of the baton where the biface is struck. The resulting flake will exhibit a flat, diffuse bulb of percussion and a slight lip on the ventral side of the flake (Crabtree 1970). The edge of the biface worked with the soft baton will be considerably more regular than the biface edge formed by the use of a hard hammer because the striking platform is longer with the soft hammer technique. Experiments by the author have shown that an indirect percussion technique with a wooden punch can remove flakes which are indistinguishable from the flakes removed by direct percussion with a soft hammer.

For the third knapping techniques—pressure retouch—flakes were removed from the edge of the biface by exerting pressure against the edge with a pointed object, most likely of antler or bone. The flakes removed by pressure retouch

are flat and much narrower and thinner than soft hammer flakes. The resulting biface edge is characteristically quite straight and regular.

These three knapping techniques are recognized in Dangling Rope and were used in a biface manufacturing sequence, the end product of which was the knife. Beginning with a large flake, a hard hammer was used to roughly shape the biface. A soft hammer or soft indirect punch was then used on the biface to thin it and refine the irregularities of the edge caused by the use of the hard hammer. The final step in the manufacturing sequence involved the use of pressure retouch to achieve a straight cutting edge.

For the purposes of analysis, the bifaces were divided into three types on the basis of the exhibited knapping technique. Blanks were those specimens which exhibited primarily hard hammer retouch. Preforms are predominately soft hammer retouched and the third category, knives, are predominately pressure retouched specimens. It should be emphasized that this threefold division is an arbitrary classification of specimens which are actually a manufacturing continuum. The use of exhibited knapping techniques to classify bifaces follows Muto's (1971) procedure.

Blanks and preforms, sometimes called crude biface tools, are actually intermediate products of the biface manufacturing sequence. At Cowboy Cave and Walters Cave (Weder in Jennings 1980), an assemblage of bifaces was analyzed in terms of the blank-preform-knife manufacturing sequence. Measurements of the Cowboy Cave bifaces showed that the blank to knife continuum exhibited the expected characteristics (i.e. a sequential reduction in length, width, and thickness and an increased refinement in the cutting edge shown by a decrease in the edge angle variation). Microscopic examination of the biface edges also revealed an increasing prevalence of wear polish on specimens which were closer to the end of the manufacturing process. Only 18% of the blanks

from Cowboy Cave exhibited wear polish, while 38% of the preforms and 69% of the knives had noticeable wear polish. These data indicate that although specimens in the early stages of the biface manufacturing sequence might be used for cutting, the specimens of the final stage was undoubtedly the preferred cutting implement.

Evidence of edge grinding was also noted on the blanks and preforms from Cowboy Cave. Since edge grinding is a technique of striking platform preparation prior to further flaking (Sheets 1973), the status of blanks and preforms as preliminary stages in tool manufacture is enhanced.

BIFACES

Because the largest single category of tools recovered from Dangling Rope were bifaces, the discussion of these bifaces in terms of the manufacturing sequence described above is pertinent. Each biface from Dangling Rope was classified visually by noting the predominant flaking technique. Subsequent to classification, each biface was measured for maximum length, width, and thickness with a caliper and the maximum and minimum edge angles were measured with a contact goniometer. After the measurements were completed, each biface was examined with a 10x to 45x variable magnification binocular microscope in order to ascertain if the biface exhibited any wear polish or edge grinding. It should be noted that this approach to biface classification has the advantage of including even broken and fragmentary specimens in the analysis.

The importance of determining the presence of wear polish and edge grinding cannot be overemphasized. The presence of edge grinding on a biface indicates that the biface has been used to cut some type of soft material. Microscopically the difference between edge grinding and wear polish is very distinct. In the case of edge grinding, the high points of the biface edge are preferentially flattened and exhibit a frosty appearance. There is also a sharp

demarcation between the ground and unground portions of the edge (Sheets 1973). The edge of a biface with wear polish will show a continuous, polished, shiny edge which exhibits somewhat more rounding of the higher points than the lower areas of the edge. Table 21 shows the combined results of the biface analysis for all the Dangling Rope bifaces.

It is apparent from Table 21 that, with the exception of length, all measurements exhibit a decreasing trend from blank to preform to knife: the edge angle range, the width, and the thickness all decrease respectively. The length measurements do not conform to the expected size decrease because of the small number of complete bifaces recovered. An examination of the standard deviations reveals that there is considerable overlap in the dimensions among the three biface types, but this merely helps to confirm the hypothesis that the biface typology is an arbitrary threefold division of a manufacturing sequence continuum.

Table 21 also shows that the prevalence of wear polish increases from blank to preform to knife, this would be expected. However, the unusually low prevalence of wear polish on the knife specimens needs further clarification. A low incidence of wear polish on knives can most reasonably be interpreted by assuming that either the knives were being manufactured at the site and thus had not yet been used or that the knives were being resharpened at the site. Other evidence as well as the presence of edge grinding on the knife specimens indicates that they were probably being manufactured on the Dangling Rope bench.

In order to gain a better perspective of the biface manufacturing sequence at Dangling Rope, the analogous data from Cowboy Cave is included in Table 22. A comparison of the measured biface characteristics from Dangling Rope with Cowboy and Walters Caves indicates significance morphological similarities.

Table 21. Dangling Rope Biface Characteristics

	Maximum Edge Angle	Minimum Edge Angle	Length*	Width	Thickness	Wear Polish	Edge Grinding
			Blanks				
Mean	76°	54°	5.13	3.62	1.21		
Standard Deviation	9.1°	7.4°	1.32	0.52	0.37		
Number of Specimens	21	21	3	11	18	1	8
Difference between mean max. and min. edge angle	22°						
Percent						5%	38%
			Preforms				
Mean	55°	40°	5.98	3.12	0.69		
Standard Deviation	11.2°	6.8°	1.10	0.82	0.19		
Number of Specimens	38	38	2	10	36	10	20
Difference between mean max. and min. edge angle	15°						
Percent						26%	53%
			Knives				
Mean	45°	39°	5.35	2.46	0.47		
Standard Deviation	7.7°	7.6°	-	0.57	0.08		
Number of Specimens	14	14	1	7	15	5	6
Difference between mean max. and min. edge angle	6°						
Percent						33%	40%

*All dimensions in centimeters

Table 22. Biface Characteristics: Cowboy Cave and Walters Cave (Weder in Jennings 1980)

	Maximum Edge Angle	Minimum Edge Angle	Length*	Width	Thickness	Wear Polish	Edge Grinding
			Blanks (All Strata)				
Mean	70°	45°	5.85	3.8	0.96		
Standard Deviation	11.5°	8.9°	0.86	0.71	0.35		
Number of Specimens	94	94	23	45	90	17	48
Difference between mean max. and min. edge angle		25°					
Percent						18%	51%
			Preforms (All Strata)				
Mean	52°	40°	6.4	3.0	0.66		
Standard Deviation	11.4°	8.2°	1.9	0.91	0.23		
Number of Specimens	85	85	6	46	80	32	29
Difference between mean max. and min. edge angle		12°					
Percent						38%	34%
			Knives (All Strata)				
Mean	44°	40°	4.8	2.3	0.55		
Standard Deviation	9.7°	9.3°	1.3	0.67	0.13		
Number of Specimens	70	70	22	50	70	48	17
Difference between mean max. and min. edge angle		4°					
Percent						69%	24%

*All dimensions in centimeters

The edge angles, edge angle ranges, and dimensions for each biface type are comparable between both groups of bifaces. Differences between the two collections of bifaces appear when the wear polish and edge grinding data are examined.

For all three biface types, the prevalence of wear polish is higher among the Cowboy Cave specimens than among the Dangling Rope specimens. The Cowboy Cave occupations have been interpreted, however, as short term foraging episodes. Bifaces were manufactured at Cowboy Cave, but they were also used as cutting instruments and as a result, the utilized bifaces, characterized by wear polish, were sometimes broken during use and were abandoned in the cave.

The Dangling Rope bifaces, the knives in particular, exhibit a lower prevalence of wear polish than the Cowboy Cave bifaces which indicates that the activities at Dangling Rope were less oriented towards subsistence than at Cowboy Cave. The major activity at Dangling Rope appears to have been the manufacture of bifaces, especially preforms. Table 23 shows the frequencies of combinations of wear polish and edge grinding for preforms and knives.

Each of the four categories of edge alteration has a pertinent interpretation. Those specimens exhibiting only wear polish are interpreted as cutting tools. The presence of edge grinding only on a biface indicates that the specimen was not completed. If a biface specimen exhibits both wear polish and edge grinding, two explanations are possible. Either the edge grinding was incompletely removed during the final pressure retouch or the already utilized specimen was being reground prior to pressure retouching to resharpen the edge. Those specimens without either wear polish or edge grinding can most plausibly be explained as instances where the appropriate knapping technique had been completed and no further work or use of the specimen had occurred.

Table 23. Edge Alterations of Preforms and Knives: Cowboy Cave and Dangling Rope

	Wear Polish only (A)	Edge Grinding Only (B)	Wear Polish and Edge Grinding (C)	Neither (D)	Total
		Preforms			
Dangling Rope - Number of Specimens	7 (18%)	17 (45%)	3 (8%)	11 (29%)	38
Cowboy Cave - Number of Specimens	24 (28%)	22 (26%)	8 (10%)	31 (36%)	85
		Knives			
Dangling Rope - Number of Specimens	5 (33%)	6 (40%)	0 (0%)	4 (27%)	15
Cowboy Cave - Number of Specimens	40 (57%)	9 (13%)	8 (11%)	13 (18%)	70

Categories A and C therefore represent those bifaces which were utilized during some subsistence activity whereas categories B and D represent those bifaces which are unused products of biface manufacturing. Table 24 condenses the information of Table 23 into two categories—used and unused bifaces. The high percentage of unused preforms and knives indicates clearly that Dangling Rope was primarily a locus of biface manufacturing activities. This interpretation is further enhanced by noting the overall numbers of each type of biface at both Dangling Rope and Cowboy Cave (see Tables 21 and 22).

At Cowboy Cave, there is a gradual decrease in the number of bifaces from blank to preform to knife (due to breakage during manufacture and use) as would be expected at a site where both manufacturing and utilization of biface tools were occurring. However, Dangling Rope is a different situation. At Dangling Rope, preforms are the predominant biface type, from which it can be inferred that preform manufacture was the primary activity.

DEBITAGE

The lithic debitage from Dangling Rope was analyzed in order to gain additional data on aboriginal activities on the benchland. The debitage from each grid square was first segregated by material type and then the flakes were counted and weighed. The results are shown in Table 25.

Quartz, micrite and seven varieties of chert were identified in the Dangling Rope collection. These lithic material types were defined during analysis of debitage from several sites (Weder in Jennings, Schroedl and Holmer 1980; Weder in Jennings 1980). Thus the types defined below represent the range of variation of material types that can be found at archeological sites in southern Utah.

Table 24. Preform and Knife Use Categories: Cowboy Cave and Dangling Rope

	Preforms		Knives	
Site	Used	Unused	Used	Unused
Dangling Rope	10(26%)	28(74%)	5(33%)	10(67%)
Cowboy Cave	32(38%)	43(62%)	48(69%)	22(31%)

Table 25. Number and Weights of Debitage by material type and Grid Unit

Field Specimen Lot Number[1]	C1		C2		C3		C4		C5		C6		MI		Q		Miscellaneous		TOTAL		
	Number	Wt.*	Number	Wt.	Number	Wt.	Number	Wt.	Number	Wt.	Number	Wt.	Number	Wt.	Number	Wt.	Number	Wt.	Number	Wt.	Wt/Flake
1																					
2	77	213			7	16	10	30													
3																	20	28	114	287	2.52
4	109	169	54	68	6	32	9	16							1	10			179	295	1.65
5	863	740	132	157	45	62	74	86					96	141					1210	1186	0.98
6	744	930	141	114	36	52	90	103					56	41			11	13	1078	1253	1.16
8																					
9	336	429	40	57	56	102	47	81	31	72			220	248			81	132	811	1211	1.38
10	48	36			5	10							6	16			2	4	61	66	1.1
11											1	3	3	9					4	12	3.0
12	914	920	27	35	209	331	83	111	133	181			374	555			87	181	1827	2314	1.27
13																					
14	28	34											17	15			2	3	42	52	1.2
15																					
16	48	171			5	17	6	13					4	26					63	227	3.6
17	4	5			1	1													5	6	1.2
18	7	21					3	7					3	5	6	41			19	74	3.9
19	3	2	3	5	8	16													14	23	1.6
20	13	26					2	5									8	10	23	41	1.8
21	1	5															1	11	2	16	8.0
22	8	22															10	32	18	54	3.0
23	4	5															5	4	9	9	1.0
24	472	558	159	185	9	9							119	177	4	38	70	131	833	1098	1.32
27	14	19															7	52	21	71	3.4
28	15	20	4	9	1	53													20	82	4.1
29	5	16	1	1															6	17	2.8

Number and Weights of Debitage by material type and Grid Unit

Field Specimen Lot Number	C1		C2		C3		C4		C5		C6		MI		Q		Miscellaneous		Total		
	Number	Wt.	Number	Wt.	Number	Wt.	Number	Wt.	Number	Wt.	Number	Wt.	Number	Wt.	Number	Wt.	Number	Wt.	Number	Wt.	Wt/Flake
30															1	1			1	1	1.0
31	3	5											1	1					4	6	1.5
32	64	54			16	17			21	16			13	15			8	46	122	148	1.21
33	31	60			4	5							1	1	1	1			37	67	1.81
34	34	24													1	12	12	10	47	46	0.98
35	3	3																	3	3	1.0
36	3	6											4	25			6	25	13	56	4.3
37	92	117			14	100							20	35			11	21	137	273	1.99
38	207	151			95	79	19	11					16	13	5	12			342	266	0.78
39	118	106					9	17	21	10			95	46	6	13	10	25	279	217	0.78
40	4	8															1	8	5	16	3.2
41	31	24															3	7	34	31	0.91
42																					
43	30	61					29	28					45	100	3	52	13	123	120	364	3.03
44																					
45																					
46	41	38											47	32			26	29	144	131	0.91
47	105	125							80	103			12	21			3	20	200	269	1.34
48	9	8			4	10											3	1	16	19	1.2
49	45	29	17	8	13	9											14	16	89	62	0.70
50	136	160			36	78	24	30					31	40			40	40	267	348	1.30
51	70	81	23	20													6	11	99	112	1.13
52	1	2																	1	2	2.0
53	80	68	25	17			17	17			2	13	35	22					159	137	0.86
54	81	73	35	38	16	25	18	30					13	26					163	192	1.18
55	186	194	26	50			20	24					32	55			3	5	267	328	1.23

Number and Weights of Debitage by material type and Grid Unit

Field Specimen Lot Number	C1		C2		C3		C4		C5		C6		MI		Q		Miscellaneous		Total		
	Number	Wt.	Number	Wt.	Number	Wt.	Number	Wt.	Number	Wt.	Number	Wt.	Number	Wt.	Number	Wt.	Number	Wt.	Number	Wt.	Wt/Flake
56	9	8											5	4					14	12	0.86
57	60	59			12	13	14	10					29	65					115	147	1.28
58	101	108			13	8											49	55	163	171	1.05
59	171	198			12	10	13	9					41	70					237	287	1.21
60	36	38			4	5							11	12					51	55	1.1
61	4	5											1	2					5	7	1.1
62	85	67											7	22			8	19	100	108	1.08
63	64	101											21	34			15	49	103	184	.79
64	103	96			46	48	12	15					43	32					204	191	0.94
65	8	12			3	3							25	19					36	34	0.94
66	8	10	10	8									56	42			5	8	79	68	0.86
67	2	3																	2	3	1.5
68	5	10															2	5	7	15	2.1
69																	6	22	6	22	3.7
70	48	108	31	38			7	28					41	77					127	251	1.98
71	1	1					2	1											3	2	0.67
72	4	4					2	4	16	23									22	31	1.41
73							1	2					6	7					7	9	1.3
74	4	2			1	1							2	1					7	4	0.57
75	1	1											2	2					3	3	1.0
76																					
77	44	52			56	90							42	47			13	58	155	247	1.59
78	15	11															3	2	18	13	0.72
79			1	1															1	1	1.0
80	18	28															7	11	25	39	1.6

Number and Weight of Debitage by material type and Grid Unit

Field Specimen Lot Number	C1		C2		C3		C4		C5		C6		MI		Q		Miscellaneous		Total		
	Number	Wt.	Number	Wt.	Number	Wt.	Number	Wt.	Number	Wt.	Number	Wt.	Number	Wt.	Number	Wt.	Number	Wt.	Number	Wt.	Wt/Flake
81	145	126			18	22			25	21			302	260	3	16			493	451	0.91
82																	1	1	1	1	1.0
83	39	61											20	15			12	49	71	125	1.76
84																					
88					1	1													1	1	1.0
TOTAL	6200	6998	713	812	762	1234	531	678	372	478	3	16	1962	2451	31	196	604	1299	11196	14162	
Wt/Flake		1.13		1.11		1.62		1.28		1.28		5.3		1.25		6.3		2.15			1.26
Percent	55.4		6.4		6.8		4.7		3.3		<.1		17.5		.3		5.4		99.9%		

* Weight in Grams

1 Missing GS Lot numbers were assigned to other samples

C1-(Chert)

This material is a translucent gray chert often with opaque red and/or yellow inclusions. The gray color varies from light to dark and from almost transparent to slightly translucent. The crystalline structure ranges from cryptocrystalline to coarse. The amount of red and/or yellow inclusion ranges from 0 to 100%.

C2-(Chert)

This material is an opaque white chert sometimes with translucent gray portions. The relative proportion of opaque white to translucent gray is highly variable. In some instances there is a combination of opaque white with red inclusions. This material type is probably a variation of type C1.

C3-(Chert)

This material is an opaque brown chert with occasional translucent gray inclusions. The brown color varies from light-tan to dark-brown, but is always opaque. The proportion of translucent gray inclusions varies from 0 to approximately 50%.

C4-(Chert)

This material is an opaque gray chert which is always fine grain, but with variable degrees of silicification. The less silicified specimens may not exhibit conchoidal fractures which may be the result of rapid cooling following heat treatment by prehistoric populations.

C5-(Chert)

This material is an opaque pinkish chert with small opaque brown inclusions. The crystalline structure is fine and the inclusions generally do not exceed 10% of the volume of the chert.

C6-(Chert)

This material is an opaque purplish chert often with opaque tan inclusions. The coloration varies from a light-purple to a light-red and the tan inclusions are usually under 10%. The crystal structure is fine.

C7-(Chert)

This material is an opaque dark-red or brown very fine grain chert. The two colors are distinct and only rarely found in combination in the same piece of chert. This material is always found in the form of small (10 to 20 gram) pebbles almost invariably with a thick tan cortex.

MI-(Micrite)

This material is a dirty white, moderately coarse, silicified stone probably of sedimentary origin. It exhibits a conchoidal fracture, but because of its coarse nature, does not develop a sharp edge.

Q-(Quartzite)

This material has the coarse crystalline structure typical of quartzite. Coloration includes red, gray, yellow, and various combinations of these.

Chert type C1 was the predominate material recovered from Dangling Rope. Chert type C1 is the most common lithic material utilized aboriginally at many sites in southeastern Utah so its prevalence at Dangling Rope is not unusual.

Table 26 shows the correlation between debitage material types and the material types from which selected tool groups were manufactured. Chert type C1 was the preferred material for both bifaces and utilized flakes. The projectile points were primarily distributed among chert types C1, C2, and C3 in approximately equal proportions.

[...page 249 missing...]

All of the debitage from five randomly selected grid squares were examined to determine the technological attributes of each flake. The results are shown in Table 27. Although the unidentifiable flakes accounted for the majority of the total, the soft hammer flakes consistently outnumber the hard hammer flakes by a wide margin. This fact supports the interpretation that Dangling Rope was primarily a locus of preform manufacturing activities. The discrepancy between the ratio of preforms to blanks (1.8:1) probably indicates that frequently blanks were brought to the site and then worked with a soft hammer to manufacture preforms.

Figure 105 show a grid map of the Dangling Rope bench with Field Specimen lot numbers. The number in each grid in Figure 106 is the total number of flakes recovered from each 50m x 50m grid square. Five grid squares show particularly high concentrations of debitage compared to the rest of the site. However, the absolute concentration of debitage is quite low. For the total area (180,850 m^2) collected, the debitage concentration is only 0.062 flakes per square meter. By comparison, the mean debitage concentrations for the two tested sites, 42KA1708 and 42KA1706, are 4.19 and 1.06 flakes per square meter, respectively.

HAMMERSTONES

Only two complete hammerstones were recovered from Dangling Rope (42KA1709, FS# 62 and 66). However, 25 hammerstone fragments were recovered. These fragments are typically a large hard hammer produced flake which has been purposefully removed from the battered edge of a hammerstone.

CORES

A total of 17 cores were recovered from Dangling Rope. The cores ranged in weight from 5 grams to 290 grams with a mean weight of 55 grams. Lithic material C1 accounted for the greatest number of cores as shown in Table 26.

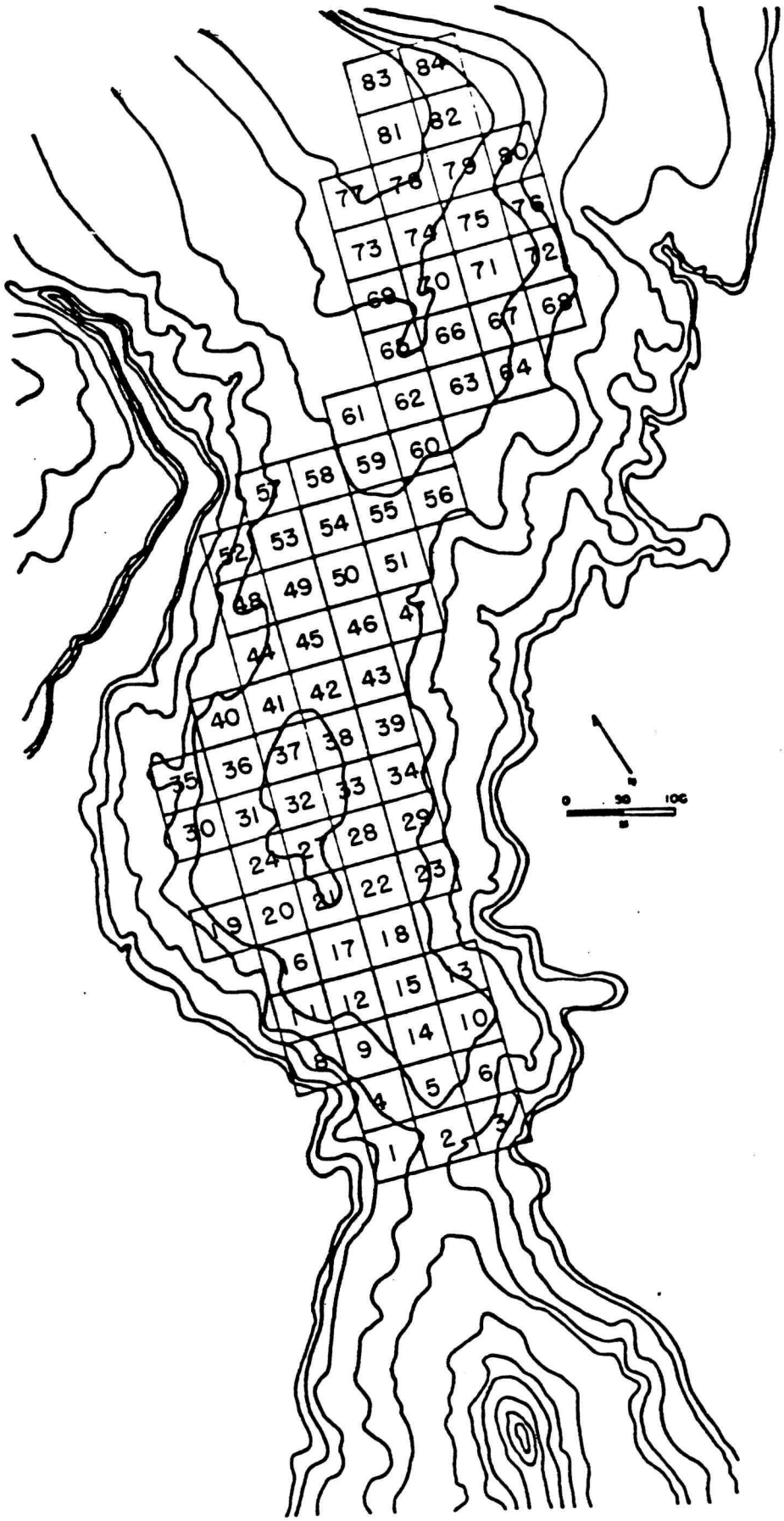


Figure 105. Location of field specimen lots from Dangling Rope Canyon.

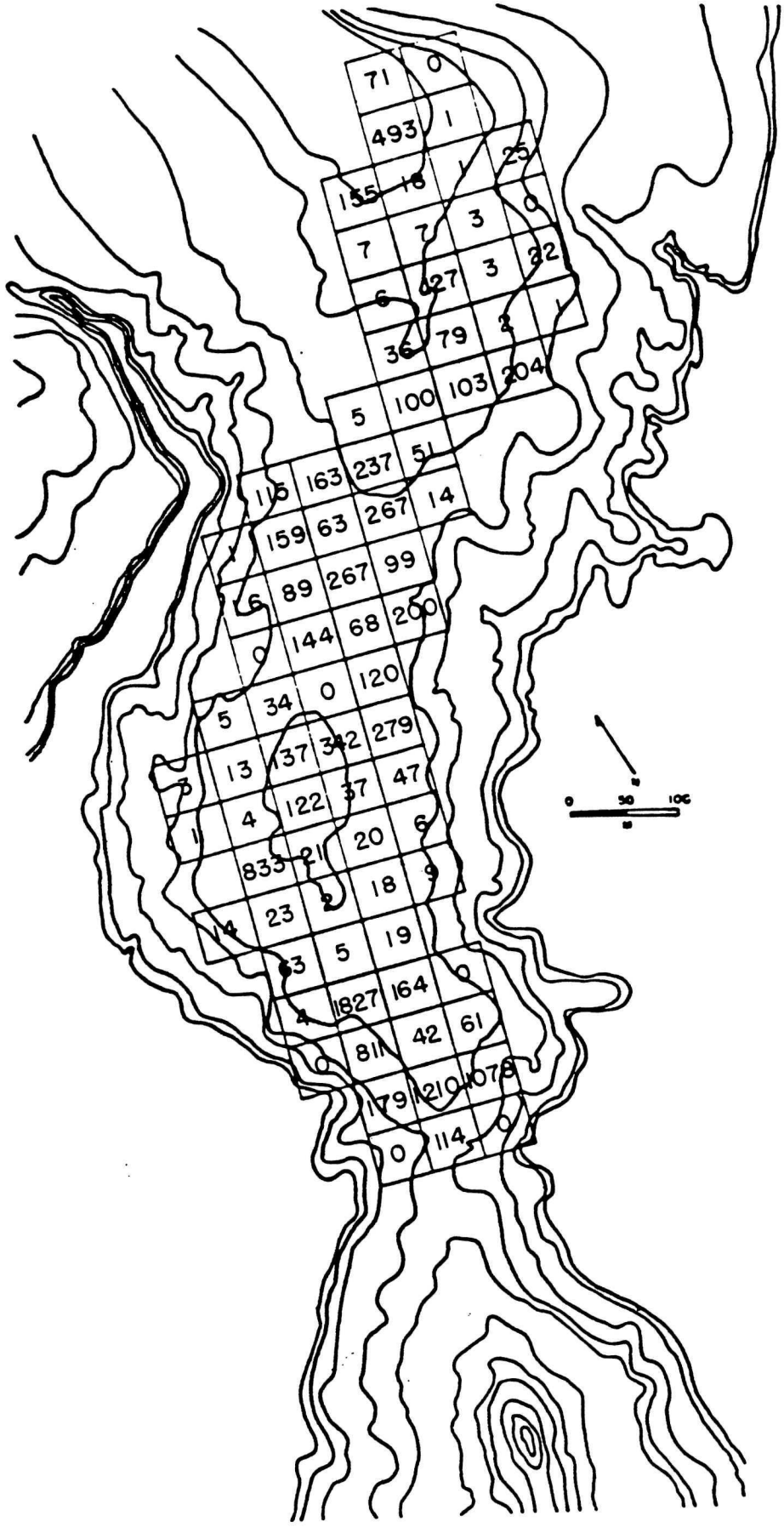


Figure 106. Distribution of debitage on Dangling Rope bench by grid square.

Table 27. Technical Characteristics of Debitage from Selected Grid Squares

	Hard Hammer	Soft Hammer	Unidentifiable	Total
Lot No. 47 -				
Number of flakes	13 (6.5%)	58 (29%)	129 (64.5%)	200
Lot No. 81 -				
Number of flakes	20 (4.0%)	113 (23.0%)	360 73.0%)	493
Lot No. 62 -				
Number of flakes	3 (3%)	28 (28%)	69 (69%)	100
Lot No. 64 -				
Number of flakes	4 (2%)	63 (30.9%)	137 (67.1%)	204
Lot No. 6 -				
Number of flakes	38 (3.5%)	289 (26.8%)	751 (69.7%)	1078

UTILIZED FLAKES

Utilized flakes are defined as flakes which exhibit use retouch along one or more edges. Although intentional pressure retouch was sometimes used to refine the edge angle of a flake, generally a flake with the required edge angle was selected from the unmodified flakes at hand. Use retouch chips can be distinguished from intentional pressure flaking by several characteristics. A use chip is generally quite small, irregular in size and rapidly expanding. In addition, the use chip normally terminates in a hinge or step fracture (Crabtree and Davis 1968). All of these characteristics imply that the angle of applied force and/or the degree of force was unlike that which would be used for skilled intentional pressure retouch (Tringham et al. 1974). It is thus apparent that use retouch is most likely the result of excessively forceful tool pressure on a hard object. The results of Crabtree and Davis' experiments (1968) support this interpretation.

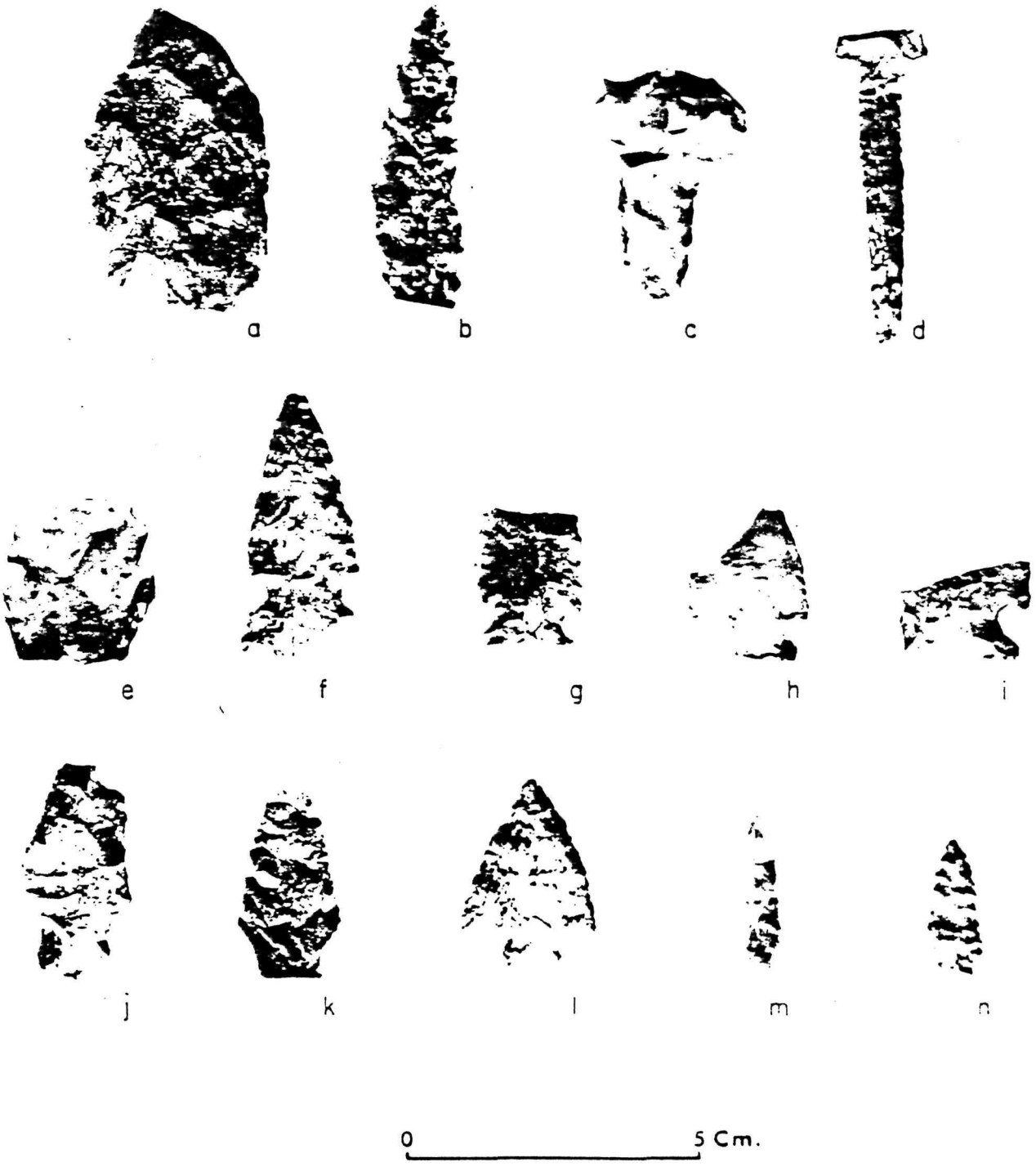
A total of 52 utilized flakes were recovered from Dangling Rope. The edge angles of the utilized edges were: mean minimum 43^{o} (standard deviation = 15^{o}) and mean maximum 44^{o} (standard deviation = 15^{o}). The utilized flakes from Dangling Rope are comparable to the utilized flakes from Cowboy Cave which were characterized by a mean minimum edge angle of 43^{o} and a mean maximum edge angle of 48^{o} (Weder in Jennings 1980).

Utilized flakes are the complement of bifacially flaked knives. The former are used for cutting hard materials, while the latter are used for cutting soft materials. The low prevalence of use retouch on biface knives (5% of Cowboy Cave specimens and none of the Dangling Rope specimens) supports this interpretation.

PROJECTILE POINTS

A total of 14 projectile points were recovered from Dangling Rope (Fig. 107). Identification of the points was based on the typologies for Archaic

Figure 107. Lithic artifacts. Preform, a; Knife, b; Scraper, c; drill, d; Sudden Side-notched, e; Northern side-notched, f; Elko side- and Corner-notched, g-i; Gypsum points, j-l; arrow points, m, n. With the exception of the drill from the Over site (42SA6214) all other artifacts are from the Dangling Rope bench.


a
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e
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l
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0
5 Cm.

projectile points developed by Holmer in his analysis of Sudden Shelter (Jennings, Schroedl and Holmer 1980) and Cowboy Cave (Holmer in Jennings 1980). The time ranges and cultural affiliation for each projectile point type follow the work of Schroedl (1976c) on the Archaic of the Colorado Plateau. The provenience of the projectile points is shown in Table 28 which also includes their cultural and temporal associations.

The Elko Side-notched and Elko Corner-notched dart points are unfortunately not rigorously diagnostic of the Archaic. Not only do the Elko points occur throughout the Archaic time span but morphologically similar points also occur in Fremont and Anasazi sites. They have been assigned an Archaic affiliation at Dangling Rope since no ceramics were recovered. The possible Gypsum dart points from the benchland (42KA1708, 42KA1709) are also tentatively assigned an Archaic age. Both points are stemmed but unfinished so that the Gypsum assignation is only probable. The Sudden Side-notched dart point, recently defined by Holmer at Sudden Shelter (Jennings, Schroedl, and Holmer 1980), is an Archaic point type with a relatively narrow time span (Fig. 107e). The Northern Side-notched dart point from 42KA1706 indicates an early Archaic utilization of the Dangling Rope bench. Five specimens from 42KA1709 have been classified as arrow points. They have been assigned to late Archaic times because of the absence of ceramics at Dangling Rope.

The two complete arrow points recovered from Dangling Rope are both nondiagnostic (Fig. 107 m, n). The three arrow point tips and one arrow point midsection are even less informative. At Cowboy Cave, the Elko series and Gypsum dart points are contemporaneous with Rose Springs, Desert Side Notch and Cottonwood Triangular arrow points. Thus there appears to have been a temporal overlap between typical Late Archaic dart point forms and arrow point forms normally associated with post Archaic cultures.

Table 28. Dangling Rope Projectile Point Provenience and Cultural Association

FS#	Type	Culture	Phase	Time Range	Comments
			42KA1706		
6-1	Gypsum	Archaic	Green River and Dirty Devil	4500-1500 B.P.	Wear polish
14-1	Northern Side-notched	Archaic	Late Black Knoll	7200-6200 B.P.	
			42KA1708		
18-4	Gypsum ?	Archaic	Green River and Dirty Devil	4500-1500 B.P.	Base unfinished, edge grinding
			42KA1709		
5-4	Gypsum ?	Archaic	Green River and Dirty Devil	4500-1500 B.P.	Tip unfinished
27-1	Elko Corner-notched	Archaic	All Phases	8300-1500 B.P.	Wear polish
33-1	Arrow ?	Late Archaic	Dirty Devil	post 2000 B.P.	Edge grinding
35-1	Arrow	Late Archaic	Dirty Devil	post 2000 B.P.	Wear polish
38-1	Arrow tip	Late Archaic	Dirty Devil	post 2000 B.P.	Edge grinding
39-1	Arrow tip	Late Archaic	Dirty Devil	post 2000 B.P.	Edge grinding
39-2	Arrow	Late Archaic	Dirty Devil	post 2000 B.P.	
43-1	Arrow tip	Late Archaic	Dirty Devil	post 2000 B.P.	Edge grinding
57-2	Elko Side-notched	Archaic	All Phases	8300-1500 B.P.	Serrated edges
71-1	Sudden Side-notched	Archaic	Early Castle Valley	6200-5000 B.P.	
83-2	Elko Side-notched	Archaic	All Phases	8300-1500 B.P.	

As noted in Table 28, two of the dart points and one of the arrow points exhibited wear polish. The technical and functional analysis of the projectile points from Cowboy Cave (Weder in Jennings 1980) showed that the presence of wear polish on dart points is not unusual although wear polish on arrow points is unusual. The Cowboy Cave dart points exhibited wear polish on 40 to 60% of the specimens regardless of type while only one out of 24 arrow points specimens was found to have wear polish.

The Cowboy Cave projectile points were examined by the same procedures as the bifaces. The dart points, regardless of type, were slightly shorter, slightly narrower and slightly thinner than the knives and had an edge angle range almost identical to that of the knives (Weder in Jennings 1980). In addition, the dart points were either pressure retouched completely over both faces, or if incompletely pressure retouched, exhibited remnants of soft hammer flake scars. The dart points from Cowboy Cave were interpreted as a possible fourth stage in the biface manufacturing sequence.

However, the arrow points from Cowboy Cave were manufactured by an entirely different process than the dart points. Not only were the arrow points significantly smaller than the dart points, but they were also much thinner. The dart points had a mean thickness of 0.50 cm. (standard deviation = 0.08 cm.). The difference in thickness was a result of the manufacturing technique used to make the arrow points. In 18 out of the 24 arrow points recovered from Cowboy Cave, the presure flaking did not remove flakes which extended entirely across the face of the arrow point and thus it could be determined that those 18 arrow points were made by pressure retouching small flakes without any other preliminary knapping.

The large thickness differrential between the dart and the arrow points is invoked to explain the low prevalence of wear polish on the arrow points. Arrow

points are most likely too thin to last long enough, if used for cutting, to develop wear polish to the same extent as the dart points. The evidence of wear polish on some arrow points indicates, however, that they were occasionally utilized for cutting.

The thickness differential between knives, dart points, and arrow points can be used to identify fragmentary arrow points such as the four specimens found in Dangling Rope Canyon. Each of these specimens (FS# 33-1, 38-1, 39-1, and 43-1) lacked a diagnostic base but were too thin to be classified either as knives or dart points.

Referring again to Table 28, it can be seen that six of the fourteen projectile points recovered from the Dangling Rope exhibited evidence of being unfinished, either on the basis of knapping morphology (FS# 5-4), the presence of edge grinding (FS# 33-1, 38-1, 39-1, and 43-1), or both (FS# 18-4).

The functional and technological analysis of the projectile points from Dangling Rope indicate that the site was probably utilized as a knapping area all through the Archaic period and possibly into the post Archaic.

SCRAPERS

Two scrapers were recovered from 42KA1708 and ten scrapers were recovered from the rest of the bench. A scraper is defined as a thick flake which has had one or more edges minimally modified by pressure retouch so as to achieve a steep edge angle, although in some instances an unmodified flake would be used if it had the proper edge angle. Either wear polish or use retouch may be present.

The wear polish found typically on scrapers has a frosty appearance like edge grinding, but it is shinier. In addition, the scraping edge is rounded rather than flattened as is the case for intentional edge grinding. The rounding of the edge is often so extensive that it is easily visible without magnification. If the scraper has been used on wood or bone, use retouch may have occurred.

When a scraper is used on a hard object (wood, bone, or antler), a particular sequence of events occurs. The first evidence of wear on the edge is small scalar flakelets. Secondary wear evidence may appear in the form of larger, hinged flakelets. Tertiary evidence consists of abrasion of the edge after the edge has stabilized (Rosenfeld 1971). The relation between use retouch and edge stabilization is an important consideration.

If the edge angle of the scraper is too low or is uneven, the pressures exerted while scraping will cause use retouch on the edge of the scraper until the edge angle is large enough to resist additional chipping. At this stage the edge has stabilized with respect to its intended use. If the stabilized edge angle is still satisfactory for the scraping purpose intended, continued utilization will no longer cause additional use retouch but will result in wear polish attrition (Tringham et al. 1974). According to Crabtree and Davis (1968), use retouch does not occur if a scraper is used to work leather or hide.

Table 29 shows the scraper use characteristics for the Dangling Rope specimens. Scraper category A can be interpreted as hide or leather scrapers, category B as unused or resharpened scrapers, category C as slightly used hard material scrapers, and category D as well used hard material scrapers.

The mean edge angle for all of the Dangling Rope scrapers is 69^{o} (standard deviation = 9.8^{o}) which is comparable to other reported collections: Clear Fork, $60-75^{o}$ (Hester, Gilbow and Albee 1973); Paleo-Indian, $66-75^{o}$ (Wilmsen 1968); Sudden Shelter, $60-65^{o}$ (Hogan in Jennings, Schroedl, and Holmer 1980); and Cowboy Cave, $66-69^{o}$ (Weder in Jennings 1980).

MISCELLANEOUS TOOLS

One graver, one awl, one irregular chunk of chert type C2, a smoothed pebble, and a small incompletely pressure retouched flake were also recovered from Dangling Rope.

Table 29. Dangling Rope Scrapers: Use Characteristics

Characteristics	Number
Pressure retouch and wear polish	3
Pressure retouch and use retouch	2
Pressure retouch, use retouch and wear polish	3
Pressure retouch only	4
TOTAL	12

LITHIC HEAT TREATMENT

The use of heat treatment to improve the flaking qualities of chert has been established by several authors. Properly executed heat treatment not only decreases the tensile strength of chert (Purdy and Brooks 1971) thereby lessening the pressure required to detach a flake, but also allows longer flakes to be removed because of the increased homogeneity of the treated chert (Mandeville and Flenniken 1974).

However, properly executed heat treatment is nearly impossible to detect in an assemblage of tools. On the other hand, improper heat treatment results in several types of characteristic fractures which can be readily identified. Purdy (1975) conducted a series of experiments which allowed her to define several different fracture types. If the chert is heated too rapidly, potlids may be formed on the surface of the chert. If the chert is cooled too rapidly, a crenated fracture of the specimen might occur. If the chert is held at a higher than necessary temperature, crazing of the specimen might develop.

The analysis of the Dangling Rope artifacts revealed that heat treatment was being utilized as a part of the biface manufacturing sequence. A knife and the dart point, three blanks and three preforms exhibited one or more of the fractures described by Purdy.

San Juan County Sites

The lithic artifacts recovered from the San Juan County sites are shown in the provenience charts (Tables 30, 31, 32). The Anasazi tool kit is similar to the Archaic tool kit with two additions—pressure retouched flakes and smoothers.

The Anasazi tool kit includes biface specimens indicating that this technology was maintained after the transition from the Archaic gathering-hunting adaptation to the Anasazi horticultural adaptation. However, a new type of bifacially flaked tool form becomes prevalent after the transition—the pressure retouched flake.

Table 30. Lithic Provenience for the Over Site (42SA6214)

	Debitage														
	Number	Weight*	Blanks	Preforms	Knives	Projectile Points	Utilized Flakes	Hammerstones	Cores	Pressure Retouched Flakes	Scrapers	Gravers, Drills	Chopper	Smoother	Total
Surface	401	967	4	7	2	8	5		18	13		2	1	3	464
Structure 1, Fill	20	16			1	1	2		1	2				2	29
Structure 2, Fill	23	100		2			1		4			1			31
Structure 3, Fill	11	4	1						1						13
Structure 3, Floor	39	63				1	1	1	2	2					46
Midden	98	265				3	1	1	3	8					114
TOTAL	592	1415	5	9	3	13	10	2	29	25		3	1	5	697

*Weight in grams

Table 31. Lithic Provenience for 42SA740

	Debitage																
	Number	Weight	Blanks	Preforms	Knives	Projectile Points	Utilized Flakes	Hammerstones	Cores	Pressure Retouched Flakes	Scraper	Gravers, Drills	Chopper	Smoother	Grinder	Crenated Cobble	Total
Surface	441	1415	2	3	1	1	15	1	8	5		1	1	2		1	482
Structures	96	196	1	1		1	2		1		1						103
Midden	166	717	1	2	1		2	5	5		1	1		3	1		188
TOTAL	703	2328	4	6	2	2	19	6	14	5	2	2	1	5	1	1	773

Table 32. Lithic Provenience for Miscellaneous Sites

	Debitage												
	Number	Weight	Blanks	Preforms	Projectile Points	Utilized Flakes	Hammerstones	Cores	Pressure Retouched Flakes	Scraper	Gravers, Drills	Totals
					42SA533							
Structure 1, Strata 1	12	24						1		1	1	15
Structure 2, Fill	2	4		1					1			4
TOTAL	14	28		1			1		1	1	1	19
					42SA511							
TOTAL	21	50		1	1							23
					42SA683							
Structure 1, Fill	12	26							2			14
Structure 2, Fill	7	16	1	1								9
Structure 4, Fill							2					2

Table 32 — Continued

	Debitage												
	Number	Weight	Blanks	Preforms	Projectile Points	Utilized Flakes	Hammerstones	Cores	Pressure Retouched Flakes	Scraper	Gravers, Drills	Totals
Structure 5, Fill	1	1										1
Rat Midden	7	5	1				1					9
TOTAL	27	48	2	1			3			2		35
					42SA684							
Structures	12	6						1				13
					42SA5379							
TOTAL	9	113	1			1		2				13
					42SA5485							
Structure 1, Fill	50	64		3				2				55
Structure 2, Fill	12	42						1	2			15
TOTAL	62	106		3				3	2			70

Table 32 — Continued

	Debitage												
	Number	Weight	Blanks	Preforms	Projectile Points	Utilized Flakes	Hammerstones	Cores	Pressure Retouched Flakes	Scraper	Gravers, Drills	Totals
					42SA5486							
Structure 1	3	1				1						4
Grinding Bin							1					1
TOTAL	3	1				1	1					5

The pressure retouched flake exhibits incomplete bifacial pressure retouch with a relatively large edge angle range. The advent of this biface form is closely associated with the appearance of arrow points in the archeological record. Since arrow points are considerably smaller than dart points, they could be made directly from small flakes solely by pressure retouch without going through the biface manufacturing sequence characteristic of the larger Archaic projectile points.

Pressure retouched flakes are interpreted as preliminary stages in the arrow point manufacturing sequence. The very low prevalence of wear polish, high incidence of edge grinding, and relatively high edge angle range characteristic of pressure retouched flakes indicate that they are not completed tools. The size range of the pressure retouched flakes is considerably smaller than the specimens of the blank-preform-knife sequence. Because of the subtractive nature of knapping, completed forms must necessarily be smaller than preliminary forms. The only completed tool form smaller than the pressure retouched flake is the arrow point.

Although a new technology was developed for the manufacturing of arrow points, the biface manufacturing sequence still was necessary for the production of knives and dart points since the arrow points are unsuited for cutting purposes. The upper strata at Cowboy Cave illustrate this (Weder in Jennings 1980). Even after the appearance of corn and arrow points at Cowboy Cave, the dart point continued to be manufactured and used as a cutting tool. Whether or not the dual use nature of the dart point as knife and atlatl projectile point was abruptly abandoned after the advent of the bow and arrow is unknown. Projectile points indistinguishable from the Elko series are frequently found in association with Anasazi and Fremont sites, however, there has been very little functional analysis performed on post Archaic dart points so that the question

remains unresolved. It is the author's hypothesis that dart point forms recovered from post Archaic sites are probably cutting tools rather than projectile points although there should be a transitional period during the Basketmaker adaptation during which the dual function of the dart point gradually becomes a single function as the bow and arrow replaces the atlatl.

A class of artifacts, called smoothers, are also a post Archaic addition to the lithic tool kit. Smoothers are characteristically unretouched pebbles exhibiting either wear polish, parallel striations or both on one or more gently rounded surfaces. The most likely interpretation for this class of artifacts is that they were utilized to smooth pottery before firing.

Lithic artifacts were recovered from nine Anasazi sites. The tool assemblages from each site will be discussed separately.

MOQUI CANYON

Over Site (42SA6214)

BIFACE MANUFACTURING SEQUENCE. The biface characteristics are shown in Table 33. Although the sample size is small, the overall similarities to the Archaic biface manufacturing sequence are evident. The three specimens in the knife category are unusual, however, in that they are atypically thin. They might be better classified as pressure retouched flakes, but were placed in the knife category either because of the presence of remnant soft hammer flake scars and/or their low edge angle range.

An interesting phenomenon of the Anasazi biface manufacturing sequence is shown in Table 33. The edge angle ranges for blanks and preforms are identical at the Over Site (42SA6214) and similar at site 42SA740 (see Table 37). This peculiarity also has been noted at several Fremont sites excavated recently near Hanksville, Utah (Sammons and Weder in Jennings et al. n.d.). The evidence indicates that Anasazi and Fremont preforms tend to have higher edge angle ranges