

AN ARCHEOLOGICAL SURVEY OF THE NORTHEAST PORTION OF ARCHES NATIONAL PARK

by

MICHAEL S. BERRY

**Antiquities Section
Division of State History
Salt Lake City, Utah**

ANTIQUITIES SECTION SELECTED PAPERS

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PREFACE

The material reported herein is the result of an archeological survey of the northeastern sector of Arches National Park, Grand County, Utah. The survey was conducted by representatives of the Antiquities Section, Division of State History, State of Utah, and funded by the National Park Service pursuant to Executive Order 11593.

Investigations were initiated on September 1, 1974 and concluded on November 2, 1974. Field operations were supervised by myself and David B. Madsen. Crew members were Christian Lund, Thomas Zeidler, Jan Applegarth and Stanley Davis. Kathy Applegarth accompanied us in the field and assisted in camp duties.

I would like to express appreciation to David Madsen and Claudia Berry for providing constructive criticism of several drafts of this report and to Carl Falk, Francis Calabrese and Marvin Kay of the Midwest Archeological Research Center for their critical evaluation of the first version. Thanks are also due to Larry Reed, park ranger, for his courtesy and cooperation on logistic matters during the survey. Laurie George typed numerous drafts and the final copy of the report. La Mar Lindsay compiled the bibliography.

A few comments are necessary regarding particulars of format. I have not included a summary of previous investigations. Several of these are readily

available in published form (Gunnerson 1957, 1969; Sharrock 1966; Winter 1975; Wormington and Lister 1956). The interested reader should refer to these sources. However, for present purposes, the discussion and citations offered in the section termed "Prehistoric Cultures of the Region" provide adequate coverage of relevant data and interpretive frameworks.

All temporal references are given in terms of before present (B.P.) rather than B.C./A.D. Radiocarbon dates have been rounded off to the nearest fifty years. We are currently involved in a project to convert all radiocarbon dates from Utah and adjacent states to calendric dates based on the Bristlecone pine data of Damon, et al (1972). The results may necessitate some modifications in the temporal/cultural relationships proffered in this report.

All sites recorded in Arches National Park are located in Grand County, Utah. The standard Smithsonian trinomial system designations for state (42) and county (Gr) have been deleted from maps depicting site distributions to avoid crowding.

With these exceptions noted, the report is a straightforward, descriptive account of survey activities and subsequent analysis. Major sections include: Introduction, Setting, Prehistoric Cultures of the Region, Archeological Sites, Artifacts, and Cultural Affiliation and Chronology.

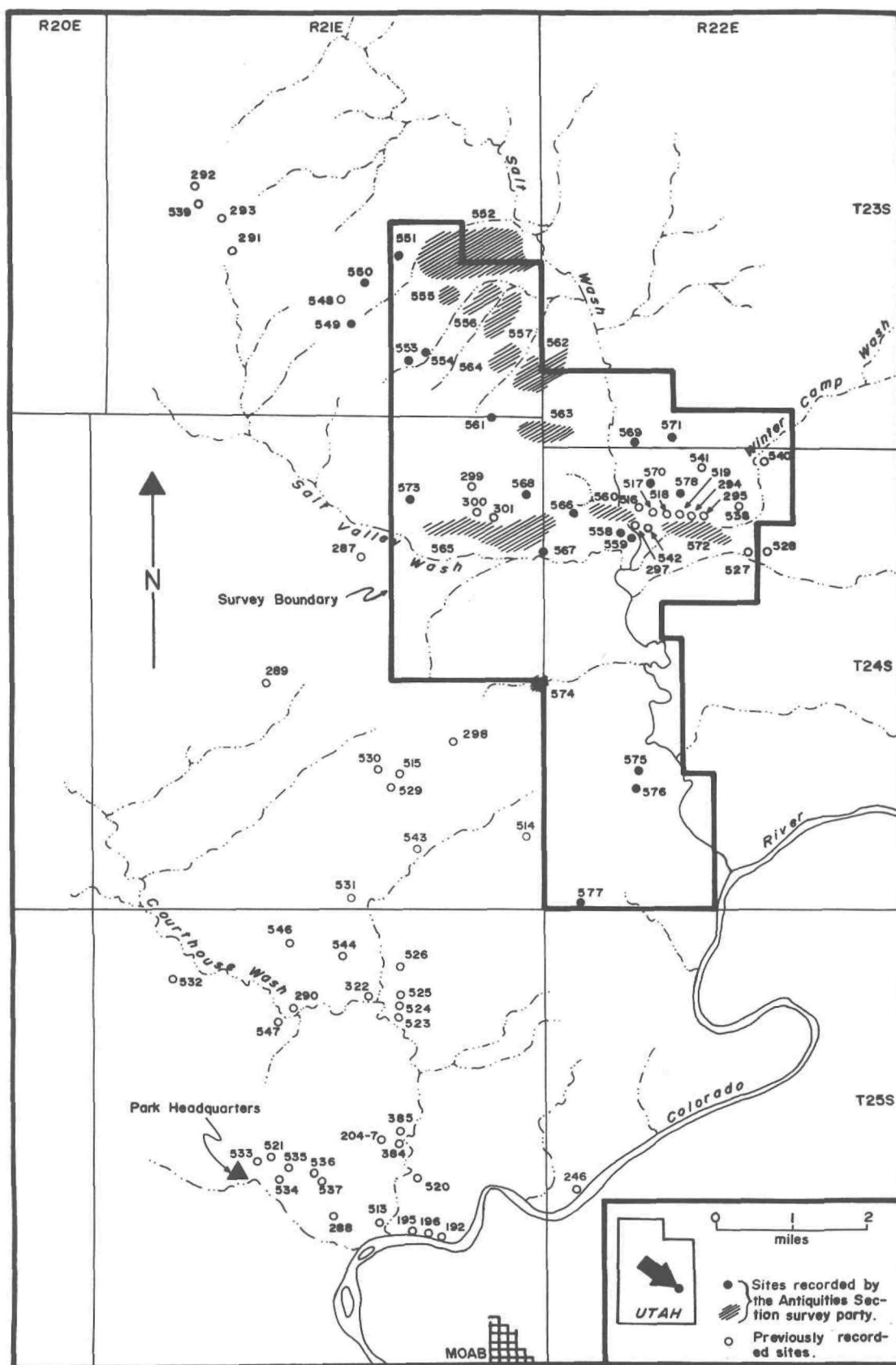


Fig. 1 Reported site distribution in Arches National Park and survey limits of Antiquities Section investigations. All sites are located in Grand County, Utah. The 42Gr prefix has been deleted.

INTRODUCTION

The Antiquities Section, Division of State History, conducted an archeological survey of Arches National Park, Grand County, Utah, between September 1 and November 2, 1974. The area (Figure 1) comprised approximately 28 square miles including: T23S, R21E, Sections 23, 25, 26, 35, 36; T24S, R21E, Sections 1, 2, 11, 12, 13, 14; T23S, R22E, Sections 31, 32, 33; T24S, R22E, Sections 4, 5, 6, 7, 8, 9, 11, 18, 19, 20, 29, 30, 31, 32. Thirty previously unrecorded sites were located during the survey. These and the fifty-nine sites located by earlier surveys are shown in Figure 1. Time limitations did not allow a concerted effort to revisit all the known sites. We only attempted, with varying success, to locate those plotted within the present survey area.

The extant archeological literature for the Park and adjacent areas was consulted prior to investigation and found generally acceptable in terms of descriptive content but mediocre at the interpretive level (see *Prehistoric Cultures of the Region*). In the absence of any coherent areal synthesis, no a priori hypotheses or "problem oriented" research designs were justified as a guide to investigation. The purpose of the survey was simply to locate all sites within the arbitrarily bounded area described above. In keeping with this "statement of ignorance" approach, no universal definition of what constitutes a "site" was employed. It has been our experience that, as a matter of practical expedience, site definition is context specific, i.e., one flake of obsidian would be considered a "site" if found stratigraphically associated with mammoth bones, but ordinarily would not if found as an isolated surface artifact. An attempt will be made later to formalize the subjective criteria as they evolved during the progress of the survey.

The survey techniques were concordant with the modest investigatory goals. We merely walked every square foot of the survey area with no preconceived notions of where we might find evidence of aboriginal occupance. This procedure entailed approximately 930 man-hours with the crew consisting of four to five individuals. When artifact concentrations were encountered, they were photographed, located as nearly as possible on the available U.S.G.S. maps, and recorded on standard survey forms. In addition, surface collections were taken where practicable. No standardized collection procedure was employed due to the great disparity in site size (see *Archeological Sites*). Sites varied from small chipping stations about 10 ft. in diameter to chert quarries

which covered several acres. Intensive sampling of the quarry sites was not attempted. We recognized immediately that an adequate sampling and subsequent analysis of the quarry materials would constitute a major project beyond the scope of the present survey. An extensive project designed to extract the maximum information from these sites should be undertaken in the near future.

One more factor bears mentioning with regard to the general productivity of this survey. We recovered very few "finished" artifacts useful for comparison with better known archeological areas. I initially attributed this phenomenon to the presumed "primary" function of the survey area. I inferred that the large quarries were the only significant attraction for the aboriginal inhabitants and that these were the source of raw materials which were both fabricated and used in other areas. This seemed reasonable since I have conducted surveys in numerous portions of Utah and never have I seen an area so devoid of artifacts of diagnostic utility. The inference was plausible but incorrect. Moab residents freely acknowledge that Arches National Park used to be a good place to find arrowheads and pottery and the local museum boasts a collection of several hundred projectile points recovered from within the Park boundaries (see Figure 2). The new, and equally plausible, inference is simply that road development in national parks provides easy access to archeological sites, attracting more amateur archeologists than can reasonably be controlled by park rangers.

Given the small size and less than illuminating character of our survey collection, we sought to augment the interpretive value of this report by incorporating all extant collections from Arches National Park in the present analysis. The results were disappointing. Artifacts from previous surveys were labeled to indicate their site provenience. However, with few exceptions, the labeled artifacts do not resemble the artifacts described in the site survey forms.

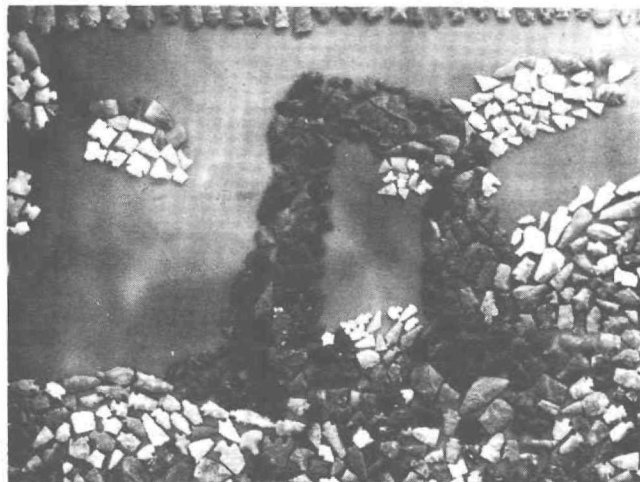


Fig. 2 Replica of Delicate Arch fabricated from projectile points.

There was an apparent break-down between field and laboratory procedures that cannot be credibly unscrambled in retrospect. All of these artifacts have been included in the tentative typology presented later, but the reader should not assume any degree of confidence in their purported provenience. Artifacts from previous collections, comprising the bulk of described material, are appropriately distinguished in the descriptive section and marked with an asterisk in all provenience charts.

In sum, the data from Arches National Park preclude interpretation beyond a very rudimentary level. The tentative conclusions that may be justifiably drawn are summarized at the end of this paper.

SETTING

Arches National Park lies within the Canyon Lands subdivision of the Colorado Plateau physiographic province: a semi-arid, highly dissected region of southeastern Utah. The Park is named for its many spectacular natural arches formed in the Entrada Sandstone. It was established as a National Park in 1971, and is one of the major tourist attractions of "Red Rocks" country.

The major stratigraphic exposures of the Canyon Lands subdivision (after Lohman 1974 and Stokes 1952) are: Hermosa Formation, Rico Formation, Cutler Formation, Moenkopi Formation, Chinle Formation, Wingate Formation, Kayenta Formation, Navajo Sandstone, Entrada Sandstone, Summerville Formation, Morrison Formation, Cedar Mountain Formation, Dakota Sandstone, and Mancos Shale.

The dominant structural feature in the area is the Salt Valley Anticline which runs from southeast to northwest through the middle of the survey area (Stokes 1952). Exposed rocks consist primarily of Jurassic and more recent formations with Entrada Sandstone predominating although the Hermosa is exposed at the crest of the anticline and in Salt Wash. Navajo and Entrada exposures on the flanks of the anticline are higher than the more recent Summerville and Morrison Formations to the northeast.

Remnants of the Summerville Formation contain large concretionary masses of white, gray, blue and pink chert which were aboriginally used as sources of lithic material. The distribution of these quarries (Figure 5) graphically indicates the direction of the anticline which parallels them on the southwest.

No meteorological data is available for Arches National Park. The nearest weather station is in Moab. Direct extrapolation from the Moab data is misleading due to elevational differences. Moab lies at an elevation of 4000 ft. whereas the majority of sites located by the survey were between 4400 and 5000 ft. Precipitation in the Park area is probably higher than recorded at Moab while the frost-free period and mean annual temperature are presumably lower.

Average annual precipitation during the 85 year history of the Moab weather station is 8.4 inches. June is typically the driest month but, in general, precipitation is distributed equally throughout the year. The average frost-free period is 166 days. The average temperature during the growing season is 70 degrees as compared to an annual mean of 55 degrees.

Arches National Park is located primarily in the pinyon-juniper and desert scrub zones (Richmond 1962; Kuchler 1964). Vegetation is sparsely distributed over the landscape though occasional pockets of denser growth occur in the immediate vicinity of seeps, springs and intermittent drainages. Juniper (*Juniper utahensis*) and pinyon (*Pinus edulis*) occur in both pure and mixed stands between 4400 and 5200 ft., with juniper dominating the lower elevations. Associated species include Mormon tea (*Ephedra* sp.), sagebrush (*Artemisia tridentata*), blackbrush (*Coleogyne ramosissimum*), Indian ricegrass (*Oryzopsis hymenoides*), squawbush (*Rhus trilobata*), yucca (*Yucca* sp.) and prickly-pear (*Opuntia* sp.). Willow (*Salix* sp.) and tamarisk (*Tamarix gallica*) dominate the sandy flood plain of Salt Wash.

The principal game species in the triangle formed by the Colorado and Green Rivers are mule deer and mountain sheep. Carnivores include mountain lion, bobcat, gray fox, red fox and coyote. Beaver, badger, weasel, porcupine, ring-tail cat, jackrabbit, cottontail, and skunk occur as well as several species of rats, mice, squirrels, chipmunks and bats (Durrant 1952).

PREHISTORIC CULTURES OF THE REGION

Portions of southeastern Utah have been variously occupied by Paleo-Indian "Big-Game" hunters, Archaic period hunter-gatherers, Fremont and Anasazi agriculturalists and the proto-historic and historic Ute and Navajo. Our knowledge of particular periods of occupation and adaptive specializations of these groups is much more secure at the recent end of the time scale. Deficiencies in the extant data and the major interpretive difficulties involved are discussed below.

PALEO-INDIAN

The evidence of Paleo-Indian occupation of the area (Figure 3) consists solely of undated surface finds of Folsom fluted points. Most of these points were found on the divide between the Green and Colorado Rivers at an elevation of 4800 ft. (Hunt and Tanner 1960). Isolated finds are also reported from the Tripp (Tripp 1966) and Silverhorn (Gunnerson 1956) sites located in south-central Utah and from Sweet Alice Spring, San Juan County (Sharrock and Keane 1962). These distinctive points have been radiocarbon dated in the Plains area between 10,780 $\pm$ 135 and 9880 $\pm$ 350 B.P. (Irwin 1971; Haynes 1971). In addition, Meig-

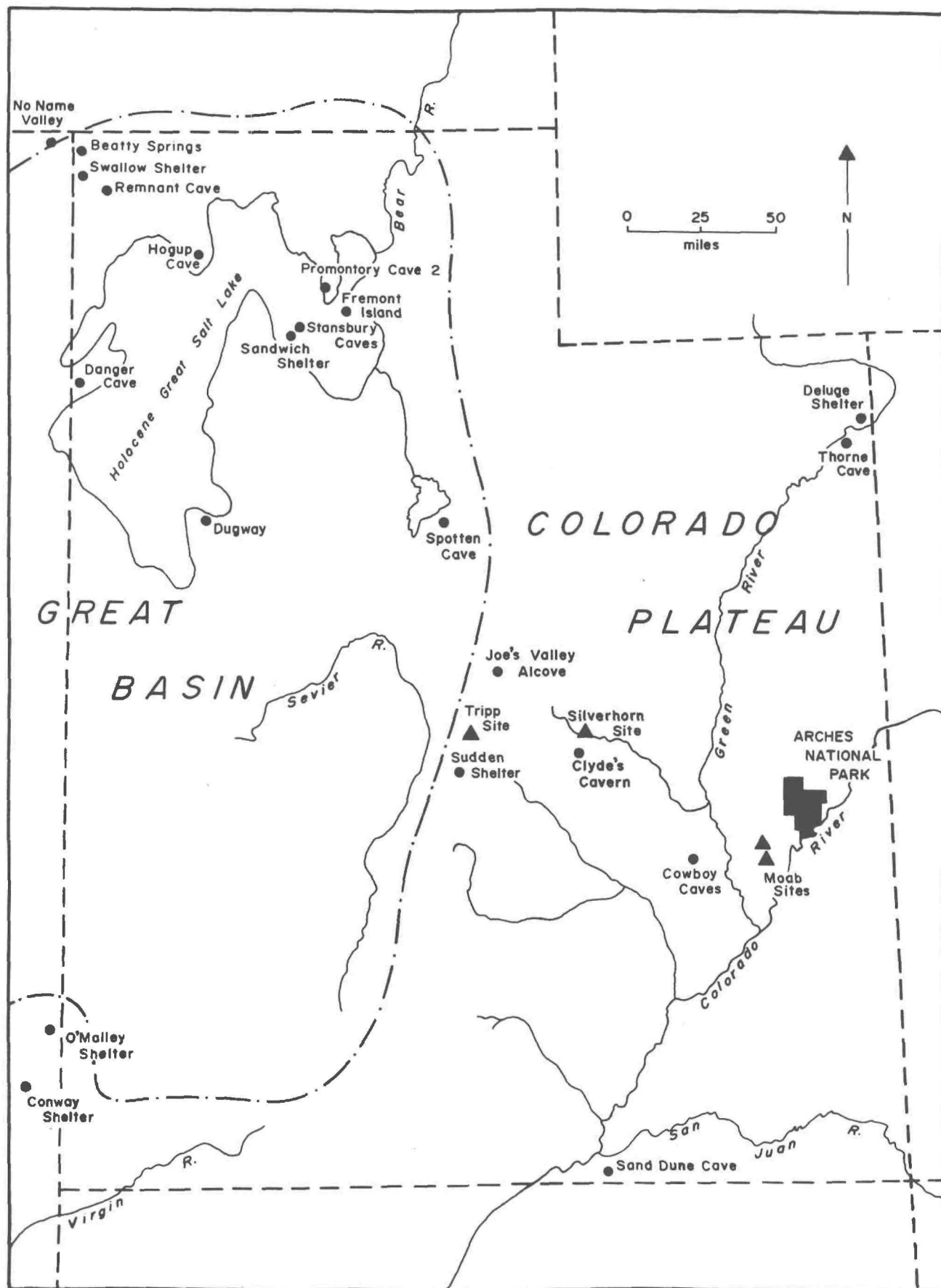


Fig. 3 Major Paleo-Indian and Archaic period sites discussed in text. Triangles denote Paleo-Indian surface finds. Circles denote Archaic sites. The limits of Holocene Great Salt Lake depict the post 10,000 B.P. maximum (after Madsen and Berry 1975).

han and Haynes (1968, 1970) suggest a date of 9000 B.P. for the Folsom complex at Borax Lake, California on the basis of obsidian hydration dating. These data do not, of course, settle the question of the age of the Utah finds. However, a tentative range of 11,000 to 9000 B.P. may be posited in lieu of direct dating evidence.

ARCHAIC HUNTER-GATHERERS

The term "Archaic" refers to the time span between the inception and demise of the earliest hunting and gathering cultures in western North America. The terms "Desert Archaic" and "Desert Culture" (Jennings various) are not employed here since the adaptive implications and the associated interpretive framework are inconsistent with current models of paleoenvironmental conditions (Madsen and Berry 1975).

Temporal placement varies from region to region as do the specific artifact complexes. The Archaic period in Utah (Figure 3) began at ca. 10,000 B.P. (and thus partially overlapped the temporal range of Folsom points) and lasted until ca. 2500 B.P. (Madsen and Berry 1975). Initial settlement occurred along the periphery of Holocene Great Salt Lake. Faunal remains from lake-side sites such as Danger Cave (Jennings 1957), Hogup Cave (Aikens 1970), and Sandwich Shelter (Marwitt, Fry and Adovasio 1971) included mule deer, bison, antelope, several species of rodents, and shore and wading birds. Edible plant remains from lakeside sites such as Danger Cave species dominated by pickleweed (*Allenrolfea occidentalis*). Associated artifacts included the atlatl with both lanceolate and notched triangular points, flat milling stones, basketry, rabbit nets, rabbit skin robes, stone drills and scrapers, bone awls, and a wide variety of utilitarian lithic implements. Lake-side settlement ceased by ca. 3500 B.P., probably as a result of Neoglacial flooding and the consequent inundation of fresh water springs and halophytic resource zones (Madsen and Berry 1975). The entire eastern Great Basin was abandoned by ca. 2500 B.P. and remained unoccupied prior to the influx of Fremont agriculturalists (Madsen and Berry 1975).

The Archaic period on the Colorado Plateau in eastern Utah began at ca. 8000 B.P. as indicated by the basal date from Joe's Valley Alcove (Evan DeBlois, personal communication). Nearby Sudden Shelter was occupied by Archaic hunter-gatherers from ca. 7500 to 3300 B.P. (J. D. Jennings, personal communication). The artifacts from the two sites are quite similar, both being marked by the dominance of notched, triangular points to the near exclusion of lanceolate varieties. At Clyde's Cavern in the San Rafael Swell the Archaic component has been dated at 3000 B.P. (Winter and Wylie 1974).

Deluge Shelter (Leach 1970) in the Uinta Basin of the Colorado Plateau was first occupied at either

ca. 3800 or 3600 B.P. (the two lowest dates were stratigraphically reversed). The terminal Archaic date is given as 1600 B.P. However, I am not convinced that the artifacts associated with this date are assignable to the Archaic hunter-gatherer complex. I have obtained the Deluge Shelter collection through the cooperation of David A. Breternitz. A comparison of the artifacts in question with Archaic collections from Sudden Shelter, Joe's Valley Alcove, Danger Cave and Hogup Cave should resolve the question. If Leach's assignation proves to be correct, the Deluge Shelter data will extend the known duration of the Archaic period in Utah by nearly 1000 years. Thorne Cave (Day 1964), which is also located in the Uinta Basin, was occupied briefly at ca. 4200 B.P.

Cowboy Cave (J. D. Jennings, personal communication) and Sand Dune Cave (Lindsay, et al 1968) both have early components dated respectively at 6800 B.P. and 7700 to 7150 B.P. The radiocarbon sample from Cowboy Cave was charcoal from the basal cultural deposit. Associated with this stratum was a distinctive, open-twined yucca fiber sandal. I mention this since the dates from Sand Dune Cave were derived from samples of nearly identical sandals. No stone has been recovered from Cowboy Cave and the lithics that may have been associated with the early dates from Sand Dune Cave cannot be unequivocally determined. Stratigraphic controls were not employed by the excavator and spurious artifact associations are evident in the written report.

Moonshine Cave (Pendergast 1961) is located on Mill Creek, a short distance south of Arches National Park. While no dates are available, the distinctive split-twig figurines recovered from the deposits are diagnostic of Archaic period occupation. They have been dated elsewhere to between 4100 and 3100 B.P. (Fowler 1973).

Little may be inferred regarding Archaic subsistence-settlement patterns on the Colorado Plateau. Certainly, the lake periphery exploitation model is inapplicable, though it is possible that there might have been some dependence on the resources of high elevation marshes. Any reasonable statement regarding these matters must await the results of additional research including controlled stratigraphic excavation and macrofossil and faunal analysis as well as palynological research of both cultural and natural depositional sequences.

DISCUSSION

The origin of the Western Archaic hunter-gatherers is unknown. The association of Folsom points with Holocene lakes in the western Great Basin (Davis and Shutler 1969) suggests a subsistence orientation similar to that documented for the earliest Archaic period settlements on the periphery of Holocene Great Salt Lake. However, the evidence is, as yet, too scant to posit cultural continuity.

Archaic settlement in Utah is best documented for the western half of the state which lies in the Great Basin physiographic province. On the Colorado Plateau of eastern Utah, only seven tested or excavated sites have been dated to this period. Regrettably, the three dated sites nearest Arches National Park (Clyde's Cavern, Cowboy Cave and Sand Dune Cave) are uninformative regarding artifact associations. Hunt's survey work in southeastern Utah (Hunt 1953; Hunt and Tanner 1960) has served to establish the presence of pre-agricultural groups in the La Sal Mountains to the southeast of the Park. The evidence adduced in support of her proposed "complexes" is highly conjectural and her tentative chronology is based on typological cross-dating and presumed association with poorly dated alluvial events. These objections aside, Hunt's framework stands as the only attempt at ordering the data for pre-agricultural groups in southeastern Utah. The sequence (from earliest to latest) includes the Moab, La Sal and Uncompahgre complexes. The criterion of the Moab complex is the association of Folsom and Pinto projectile points. However, this contention is based solely on surface collection and these two widely distributed point types have yet to be found associated in a stratified context. Hunt's La Sal complex is marked by the predominance of Gypsum points in association with Pinto varieties. The most recent non-agricultural complex is the Uncompahgre. The Uncompahgre complex was initially defined by Wormington and Lister (1956) as a result of survey and excavations in western Colorado. Hunt incorporated the terminology in the La Sal Mountain sequence due to similarities in artifact content. The complex is defined by the presence of small corner-notched arrow points, flat-slab milling stones and the absence of pottery and agriculture. Both Hunt (1953, 1960) and Wormington and Lister (1956) propose the Uncompahgre complex as the immediate predecessor of the Fremont agriculturalists and Hunt (1960) suggests a dating range of 3000 to 1500 B.P. The derivation of the Fremont culture from the Uncompahgre complex is an intriguing possibility, but there is no firm evidence of this relationship and no direct chronological data. The Uncompahgre sites in Colorado were never dated and all the radiocarbon samples have been subsequently lost (H. M. Wormington, personal communication). Hunt's "guess dates" for the complex are based on the presumed association with the Tsegi alluvium and may be as much as 1500 years too early. One criterion of the Uncompahgre complex is the corner-notched point associated with the use of bow and arrow. However, the bow and arrow was not introduced into the Colorado Plateau or the Great Basin (and possibly the whole of western North America) until ca. 1500 B.P. (Madsen and Berry 1975). This sets the beginning rather than the end of the Un-

compahgre complex and indicates possible contemporaneity with Basketmaker II or III in western Colorado and at least some early Fremont groups in eastern Utah (Marwitt 1970).

The Uncompahgre complex will not be included among the Western Archaic hunter-gatherers. They are distinct temporally from what is defined as the Archaic period (ca. 10,000 to 2500 B.P.) and are separable on artifactual grounds from the hunter-gatherers of the Archaic period in the utilization of the bow and arrow rather than the atlatl. Uncompahgre groups may have been functionally similar to the late prehistoric Numic-speaking peoples who lived in proximity to Fremont and/or Anasazi agriculturalists, but retained a hunting-gathering subsistence base (Berry 1972, 1974).

In sum, with the exception of a single radiocarbon date from Deluge Shelter, the evidence suggests that the Archaic period on the Colorado Plateau terminated prior to 2500 B.P. (3300 B.P. at Sudden Shelter and 3000 B.P. at Clyde's Cavern) and that these early hunting and gathering cultures were thus unrelated to subsequent developments in the region.

PREHISTORIC AGRICULTURALISTS

Prehistoric agricultural settlement in Utah is generally divided into four geographic areas (Jennings 1975; Marwitt 1970; Sharrock 1966). Kayenta and Mesa Verde Anasazi sites are located respectively, in the extreme southern portion and southeastern corner of the state, generally south and east of the Colorado River. Virgin Branch Anasazi settlements occur thinly scattered throughout the southwestern corner of the state. The remainder of the state represents the approximate known distribution of the Fremont culture. These divisions should not be interpreted as "culture areas" in the ethnographic sense of the term, but merely as the approximate distribution of congeries of archeologically recovered material traits that represent typological "entities" (Figure 4).

It is probable that the subsistence activities of prehistoric agriculturalists included hunting and gathering as well as the cultivation of domesticated plants. This is based, in part, on ethnographic observation of the historic Pueblo groups (Whiting 1939; Titiev 1944; Hack 1942) and further supported by the recovery of a broad range of wild seed species and faunal remains from archeological sites (Berry 1972, 1974; Wilson 1974). The balance struck between these components of aboriginal economy was subject to ecological circumstance and cultural factors. The stability of crop production must have varied markedly from area to area. Groups utilizing rudimentary irrigation techniques and/or who were located in areas climatically favorable for crop growth were probably less dependent on wild resources than groups occupying regions characterized by extreme year-to-year

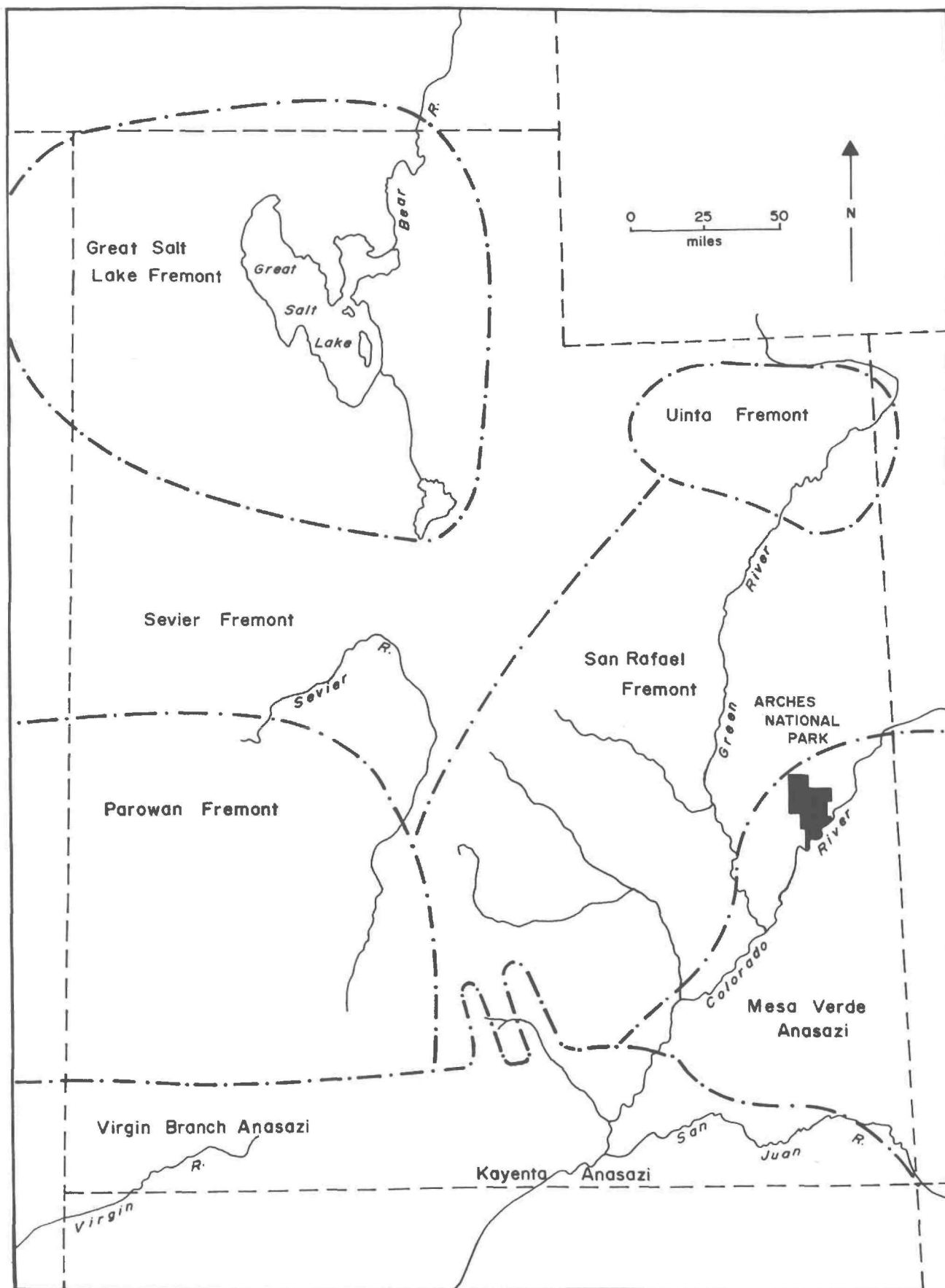


Fig. 4 Known distribution of Fremont and Anasazi cultural variants.

climatic variation. It is reasonable to assume, however, that all groups must have occasionally experienced crop failure, in which case, the local abundance of wild resources would have been critical. I mention this because most discussions concerning the diffusion and terminal distribution of southwestern agriculture are based solely on the environmental variables affecting cultigen production. Obviously, other factors must have played a determining role and the presence of alternate resources would have been a crucial settlement consideration.

With these brief comments on the agricultural/hunting-gathering adaptive strategy in mind, we may now turn to a review of the known cultural sequences.

Kayenta and Mesa Verde Anasazi

The cultural sequence first proposed by A. V. Kidder (1927) in the 1920's, is (in modified form) still utilized as a research framework by most Southwestern specialists. The generally accepted outline of this so-called Pecos Classification is as follows (after Jennings 1968; "A.D." dates have been converted to B.P. for purposes of consistency):

Latest:	Pueblo V	250 B.P. to the present
	Pueblo IV	650 to 250 B.P.
	Pueblo III	850 to 650 B.P.
	Pueblo II	1150 to 850 B.P.
	Pueblo I	1200 to 1050 B.P.
	Basketmaker III	1500 to 1200 B.P.
	Basketmaker II	1950 to 1450 B.P.
Earliest:	Basketmaker I	Pre-1950 B.P.

Basketmaker I was originally an hypothesized hunter-gatherer stage presumed to have existed over the entire southwest prior to the introduction of cultigens. Subsequent work has tended to support the hypothesis, since most workers agree that the Archaic period populations are representative of the Basketmaker I level of technology. However, the commonly held assumption that Basketmaker II developed from an Archaic or Basketmaker I substratum within the region of Anasazi occupance has yet to be demonstrated.

Basketmaker II is the term applied to the earliest Anasazi farming groups of the Southwest. Defining characteristics include domesticated corn and squash, the atlatl, milling stones, distinctive sandals and basketry. The majority of excavated sites are located in caves and rockshelters and frequently contain numerous slab-lined pits and storage cists (Kidder and Guernsey 1919; Guernsey and Kidder 1921; Nusbaum 1922; Guernsey 1931; Morris and Burgh 1954). However, the earliest dated Basketmaker II remains in Utah are open sites with pit structures on Cedar Mesa (Lipe and Matson 1973) and Castle Wash (Sharrock, et al 1963). Radiocarbon determinations and

dendrochronology tentatively place occupance at ca. 1650 B.P. and 1750 B.P. respectively.

The majority of Basketmaker III sites in Utah are small open settlements consisting of one or two sub-rectangular pit dwellings, though numerous cave/rockshelter sites are also reported (Lindsay, et al 1968; Dalley 1973; Wilson 1974). The artifact assemblage is essentially identical to Basketmaker II with the addition of both plain and black-on-gray pottery vessels and unfired anthropomorphic figurines. Cultivated plants include domesticated corn, beans, and squash. Dated sites on Cedar Mesa (Dalley 1973; Wilson 1974) and Navajo Mountain (Lindsay, et al 1968) range from 1350 to 1250 B.P.

The "type" site for Pueblo I in Utah is Site 13, Alkali Ridge (Brew 1946). This extensive settlement consisted of over 300 contiguous jacal and slab foundation surface structures enclosing three large plazas. The plazas contained small rectangular pit structures nearly identical to the Basketmaker III dwellings and three large, deep, circular pit structures. Pottery included a neck-banded gray ware, red-on-orange bowls, and effigies. The bow and arrow replaced the atlatl as the principle hunting weapon by the beginning of Pueblo I times. The dates from Site 13 cluster around 1200 B.P. No additional Pueblo I sites of this size have been reported in Utah. Most sites contain only one or two pit structures and associated surface dwellings similar to Basketmaker III settlements.

Pueblo II sites typically consist of a single subterranean structure and one to four contiguous masonry surface rooms (Brew 1946). The subterranean structures are generally referred to as kivas which (from ethnographic data) connote a ceremonial function. However, prehistoric ceremonial usage cannot be unequivocally demonstrated and it is equally plausible that these structures served as dwellings. Black-on-white decorated pottery and corrugated culinary vessels were the dominant ceramic types. The bow and arrow remained in use but side-notched points replaced the corner-notched varieties characteristic of the Pueblo I period. The early Pueblo II period was marked by dispersed site distribution and small settlement size (Brew 1946; Jennings 1966). Settlement pattern gradually became more nucleated in late Pueblo II times with a consequent increase in village size (see Dalley 1973; and Lister, Ambler and Lister 1960 for examples).

The Pueblo III period is best seen as a continuation of this nucleating trend, culminating in the large and impressive cliff dwellings of Mesa Verde and Canyon De Chelly and the large multi-story Pueblos and Great Kivas of Chaco Canyon. Pueblo III settlements in southeastern Utah were considerably less spectacular than the ruins of the great centers, but nonetheless indicate a heavy occupational

density (Brew 1946; Lipe and Matson 1973; Dalley 1973; Wilson 1974). Anasazi abandonment of the area occurred by ca. 700 B.P. for reasons which have yet to be adequately explained.

Virgin Branch Anasazi

Virgin Branch Anasazi settlement is poorly documented and the chronology is based on very few radiocarbon dates. Shutler (1961) distinguishes four developmental phases.

The Moapa Phase is typologically analagous to Basketmaker II and began some time before 1450 B.P. Both open and cave/rockshelter sites have been excavated. Open sites consist of one or two circular to oval pit structures with no associated surface rooms. With the exception of a few unfired sherds from Cave Dupont (Nusbaum 1922), pottery is not associated with this phase. The principal weapon was the atlatl. Cultigens included corn and squash.

The Muddy River Phase is equivalent to Basketmaker III. Open villages are somewhat larger than in the preceeding phase. Pottery and the bow and arrow were the only significant additions to the artifact inventory.

The Lost City and Mesa House Phases occurred between 1250 and 800 B.P. and represent a developmental continuum similar to Pueblo II and III. The Lost City Phase is marked by a rapid increase in site density and settlement size. Pit houses were typically associated with multiple room masonry and jacal surface structures. Beans and cotton were added to the list of cultivated plants.

The Mesa House Phase was marked by a shift from circular to rectangular pit structures and several stylistic changes in artifact forms. Numerous cliff dwellings were constructed during this phase, but mesa top villages were the predominant settlement type. The distinctive architectural features which serve as the defining criteria for "kivas" elsewhere in the Southwest are virtually absent in the Lost City and Mesa House Phases. The Mesa House Phase terminated at ca. 800 B.P. when the entire Virgin Branch area was abandoned. As was the case for the eastern Anasazi cultures, extant models do not adequately explain the demise of the Virgin Branch agricultural systems.

Fremont

Aboriginal farming groups in Utah north of the Anasazi area are referred to collectively as the Fremont culture. Marwitt (1970) has defined five variants: the San Rafael and Uinta variants of the Colorado Plateau and the Great Salt Lake, Sevier and Parowan variants of the eastern Great Basin. The earliest sites occur on the Colorado Plateau by ca. 1350 B.P. Fremont settlement of the Great Basin did not occur until 1250 B.P. in the Great Salt Lake region (Madsen and Berry 1975) and 1050 B.P. in the Parowan Valley to the south (Marwitt 1970; Berry

1972, 1974). Fremont occupation of Utah ended by ca. 650 B.P. Thus, the temporal span of the Fremont culture essentially paralleled the Anasazi sequence encompassed by Basketmaker III through Pueblo III. However, in terms of the trait criteria of the Pecos Classification, all sites recognized as Fremont fall within the Basketmaker III-Pueblo I range. The absence of a Basketmaker II level of technology in the Fremont sequence may simply be an erroneous conclusion imposed by the misuse of typology. These sites, wherever they are found, are invariably assigned to the Anasazi sequence. The only plausible explanation for this is that the Pecos Classification was originally designed to accomodate the Anasazi data at a time when virtually nothing was known of the Fremont. The association of Basketmaker II with Anasazi subsequently became a deeply entrenched typological "fact" in the half century of Southwestern research that followed. However, the only way to distinguish a Fremont from an Anasazi site, especially in the ill-defined "border area" between the San Rafael Fremont and the Mesa Verde-Kayenta Anasazi, is on the basis of pottery types. Since one of the defining criteria of Basketmaker II is the absence of pottery, the inclusion of all these sites in the Anasazi sequence may be a serious error. It seems much more reasonable to consider Basketmaker II as a widespread technological level which was the precursor of later developments in both the Fremont and Anasazi areas. Research along these lines might well demonstrate regional specialization in Basketmaker II artifact assemblages that will permit assignation of these sites to separate developmental lines.

The earliest dated corn in Utah (ca. 1550 B.P.) is from the pre-pottery levels of Clyde's Cavern (Winter and Wylie 1974) in association with both Fremont and Anasazi textiles. Subsequent levels contained Fremont pottery suggesting the possibility of a Basketmaker II-San Rafael Fremont continuum. As already discussed, there are no firm data to support the prevailing hypothesis that the Fremont developed *in situ* from an Archaic base. The Clyde's Cavern data thus provide a feasible alternate hypothesis of Fremont origins. This of course does not disallow the later introduction of certain technological traits (specifically the bow and arrow and possibly pottery) to the Fremont culture from areas other than the Southwest.

Under present criteria, all sites which are recognizably Fremont contain diagnostic pottery types, evidence of bow and arrow, domesticated corn and numerous minor artifact forms which do not occur in Anasazi contexts (Marwitt 1970). The distinctive "Utah type" metate and anthropomorphic figurines are associated with all Fremont variants with the exception of the Uinta Basin assemblage. Village sites vary markedly in size and architectural style. Uinta Basin sites consist of a few shallow pit dwellings, some-

times associated with coursed masonry or adobe surface structures (Breternitz 1970). The absence of deep accretional deposits suggests brief or seasonal occupation. San Rafael villages are poorly documented. Excavated sites are generally small and quite similar architecturally to the Uinta Fremont. However, survey data indicate the existence of very extensive, possibly stratified, mounds which suggests longer sedentary habitation (Gunnerson 1957). Subsistence related data is so scant as to preclude the possibility of any confident statement regarding the adaptive strategy of either the Uinta or San Rafael variants. Beyond the apparent involvement in limited agriculture, the numerous temporary use sites found in both regions attest to some dependence on hunting and gathering. However, the relative dependence on domesticated and natural resources cannot be posited.

A great deal more research effort has been expended on the Fremont occupation of the Great Basin which includes the Great Salt Lake, Sevier, and Parowan variants. The latter is the best understood as a result of extensive excavations in the Parowan Valley by the University of Utah (Marwitt 1970; Berry 1972, 1974), and the University of California, Los Angeles (Meighan, et al 1956). The largest known Fremont sites occur in that region. They are typically large, stratified mounds containing numerous pit dwellings and large multi-roomed adobe granaries. Subsistence related data from the Evans Mound (Berry 1974) indicates an annual round geared to the sedentary requirements of flood plain farming with heavy reliance on locally available floral and faunal resources. Additional data suggest that during years of crop failure, the Parowan Valley agriculturalists journeyed to the pinyon-juniper zones along the Utah-Nevada border. They remained there throughout the winter subsisting on the fall pinyon harvest and returned to the valley sites the following spring to resume agricultural activities.

A similar adjustment to the capricious year-to-year variability of Great Basin environments may be assumed for the Sevier variant until adequate information is available from that region. Sevier Fremont village sites are much smaller in area and were apparently occupied less frequently and for a shorter duration than the Parowan examples (Marwitt 1970).

A somewhat different subsistence model is probably applicable to the Great Salt Lake variant due to a highly favorable set of environmental circumstances. The ameliorating effects of the Great Salt Lake on the local climate resulted in a stability of the critical variables of corn growth not replicated elsewhere in the state. In addition, the abundant resources of the lake periphery marshes were heavily exploited by the Fremont farming groups on a seasonal basis (Aikens 1967; Marwitt 1970). This unique combination of productivity of both wild and domesticated resources

supported a cultural system whose potential viability was unrivaled by any in the state. Nonetheless, the Great Salt Lake Fremont area was ultimately abandoned just as were the other regions of Fremont occupation.

DISCUSSION

The origin of the Fremont and Anasazi cultures is still a subject of debate. It has long been assumed that both developed *in situ* from local Archaic period hunting and gathering cultures (Jennings 1957; Worthington 1955; Aikens 1970; Marwitt 1970). Aikens' (1970) interpretation of the Hogup Cave data lent credence to this assumption since the purported cultural sequence demonstrated a "smooth transition" from the Archaic period lifeway to the Great Salt Lake Fremont agricultural economy. However, a subsequent reassessment of the Hogup Cave sequence (Madsen and Berry 1975) has demonstrated the existence of a ca. 2000 year hiatus between the termination of the Archaic period and the inception of occupation by Fremont agriculturalists. Furthermore, a review of extant data from the eastern Great Basin led to the conclusion that the entire region was abandoned by ca. 2500 B.P. and remained unoccupied until the advent of the Great Salt Lake, Sevier and Parowan variants of the Fremont culture. Similarly, there is no evidence of Archaic/Fremont or Archaic/Anasazi cultural continuity on the Colorado Plateau. Radiometric data for the recent end of the Archaic time scale, while admittedly scant, suggests even a lengthier hiatus than occurred in the Great Basin.

In short, those who claim cultural continuity and *in situ* development must bear the burden of proof. As the evidence now reads, the Archaic period terminated by 2500 B.P. in the eastern Great Basin and by 3000 B.P. on the Colorado Plateau. It follows that the introduction of cultigens in these regions was brought about by immigration of populations from adjacent areas that have yet to be identified. As suggested earlier, it is reasonable to postulate that these new populations functioned on a Basketmaker II level of technology and provided the base for subsequent, independent developments in the Anasazi and Fremont areas. This is admittedly conjectural but the occurrence of Basketmaker II "type" sites in western Colorado (Hurst 1945), east-central Utah (Gunnerson 1969; Gaumer 1937) and the Uinta Basin (Burgh and Scoggin 1948) make this hypothesis at least as tenable as the prevailing view.

NUMIC SPEAKERS

The initial dispersion of Numic-speaking groups from a southern California homeland began about 1000 B.P. (Lamb 1958; Miller, Tanner and Folley 1969). They entered the southeastern Great Basin by ca. 900 B.P. and occupied the Great Salt Lake region by at least 650 B.P. (Madsen 1975). Their arrival on

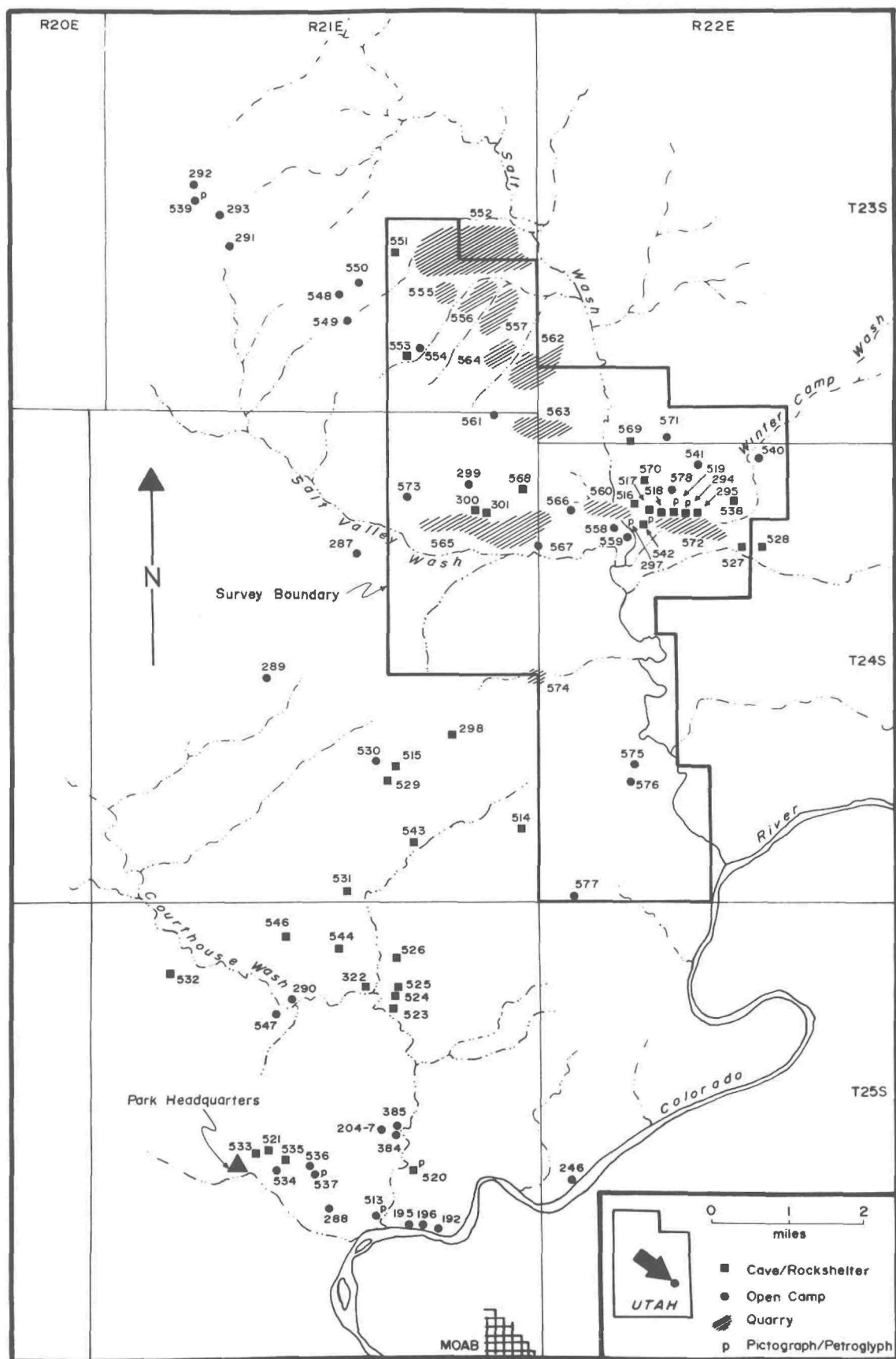


Fig. 5 Distribution of site types in Arches National Park.

the Colorado Plateau is undated but the distinctive Paiute-Shoshoni pottery is frequently found in archaeological contexts that suggest a prehistoric temporal placement (Hunt 1953). The Numic-speaking Utes occupied the Moab area at the time of White contact (Tanner 1937).

ARCHEOLOGICAL SITES

Eighty-nine sites have been recorded in Arches National Park. Fifty-nine were located as a result of previous surveys (Hunt 1953; Pierson n.d.) and thirty were discovered during the Antiquities Section investigation. Figure 1 shows the known distribution of sites and distinguishes between those previously recorded and sites located by the present survey. Figure 5 is encoded to show the distribution of the four types of recorded sites: cave/rockshelter, open camps, quarries and pictograph/petroglyphs.

It proved extremely difficult to revisit all previously recorded sites in the survey area. The best available maps are the U.S.G.S. 15' series with eighty foot contour intervals. Hundreds of narrow canyons in this highly dissected landscape do not show on these maps and until smaller scale maps become available, anyone engaged in survey activities must accept, and adjust to, being "lost" about half the time. Except where prominent terrain features are in reasonable proximity, site locations shown on the map are only approximations and may be "off" by as much as 100 meters. We can only say with confidence that we succeeded in relocating Pierson's cave/rockshelter sites near the confluence of Winter Camp and Salt Washes. In other areas, the possibility of duplication of site numbers exists. For instance, either one of our site numbers 42Gr549 and 42Gr550 might refer to Pierson's site 42Gr548 (all outside the northwest corner of the survey area, Figures 1 and 5). Because of this perplexing situation and the contradictions already noted between previous survey records and artifact collections, our work and the results of earlier surveys will be summarized separately.

ANTIQUITIES SECTION SURVEY

As mentioned earlier, we had no a priori notions of what would constitute a site in the Arches survey. We were fortunate in discovering the location and geological context of the immense quarry sites early in the conduct of the project. The presence of these quarries provided a framework for the evaluation of other artifact concentrations. Lithic debris occurs in varying concentrations throughout the survey area. The density and nature of lithic material varies inversely with distance from the quarries, constituting a crude distributional continuum. Sites termed "open camps" consist of unusually high and/or areally discrete concentrations of artifacts relative to this continuum. For

example, a concentration of flakes on the periphery of a quarry was considered part of the quarry distribution rather than a discrete site whereas a similar concentration a mile from a quarry was designated an "open camp." Cave/rockshelters presented less of a problem since any of these found to contain cultural materials automatically qualified as sites.

Of the thirty sites located during the survey, eleven were quarries, five were cave/rockshelters and fourteen were open camps. We observed no examples of aboriginal rock art.

Quarries

The quarry sites were generally coextensive with isolated outcrops of the Summerville Formation which contains large concretionary masses of chert. Figure 6 a and b compares the quarry distributions with a geologic map of the northern portion of the survey area (after Stokes 1952). Anomalies in correspondence are due to variation in the quality of the chert. The large Summerville outcrop northwest of site 42Gr552 and the outcrop between sites 42Gr557 and 42Gr564 contained coarse-grained chert with a tendency toward lamellar fracture. Neither of these showed any evidence of aboriginal utilization. In contrast, the relatively small outcrop associated with site 42Gr563 contained a superior quality, fine-grained white chert which was heavily utilized. Thus the distributional limits of the site are considerably greater than the actual size of the outcrop. Site 42Gr571 is associated with a previously unmapped Summerville outcrop.

The majority of the lithic debris found at the quarries is what Binford and Quimby (1963) refer to as "shatter," large discarded flakes produced in the initial stages of manufacture. However, a few bifaces and unifaces were recovered and one Type VIII projectile point was collected from 42Gr552. This was the largest of the quarry sites and it is also possible that it was used as a camp. It contains several fairly extensive (ca. 50 meters square) areas of discoloration which may indicate refuse middens or the remains of fires used for heat-treating lithics. The latter is a distinct possibility since the projectile point and several specimens of chipping debris exhibit the waxy luster characteristic of heat-treated chert (Crabtree and Butler 1964; Collins and Fenwick 1974).

Figures 7 and 8 depict the general morphology of the quarry sites. Figure 7 shows (from left to right) sites 42Gr552, 42Gr555, 42Gr556 and 42Gr557 as "islands" of the Summerville Formation separated by intermittent tributaries of Salt Wash. Figure 8 is a closer view showing the darker color of the formation in contrast to the dissected Entrada Sandstone which underlies it. The austere setting of these northernmost quarries suggests that site utilization was restricted (with the possible exception of 42Gr552) to raw material procurement.

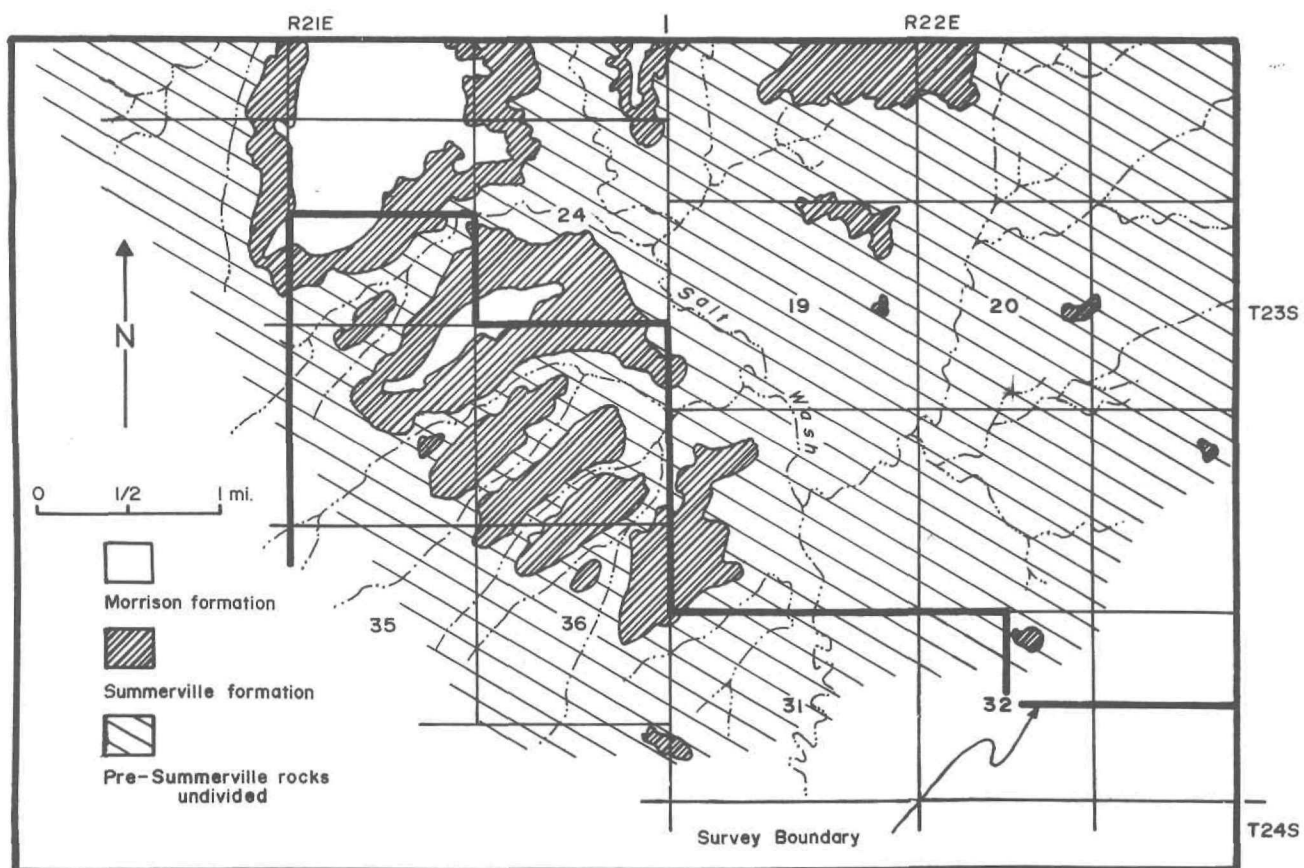
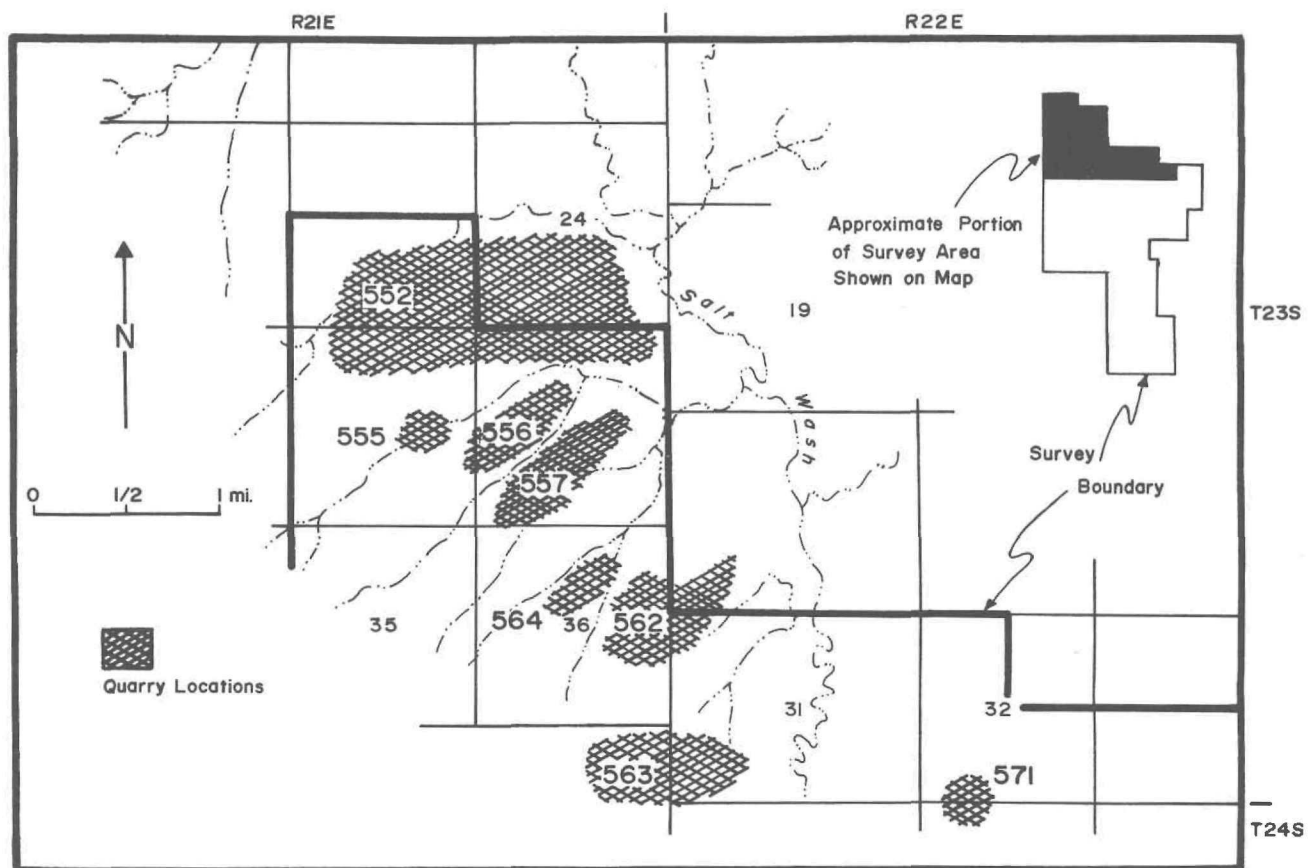


Fig. 6 (a, b) Figure 6a (top) depicts the distribution of culturally modified lithic material at the quarry sites. Figure 6b (bottom) shows the areal distribution of the Summerville Formation (after Stokes 1952). Anomalies are discussed in text.



Fig. 7 Quarry sites 42Gr552, 42Gr555, 42Gr556 and 42Gr557. View from southwest.



Fig. 8 Close-up view of typical Summerville Formation and associated quarry.

Quarry sites in the more heavily vegetated and well-watered areas along Salt Valley and Winter Camp Washes (42Gr565, 42Gr560 and 42Gr572) may have additionally been related to subsistence activities. This is suggested by the presence of a mano at 42Gr560 and the relatively dense concentration of open camps and cave/rockshelters near the confluence of Winter Camp and Salt Washes.

With one exception, the quarry sites show no evidence of vandalism. 42Gr556 has been essentially destroyed as a result of excavations for the El Paso Natural Gas pipeline which bisects the site longitudinally.

Cave/Rockshelters

Five cave/rockshelters containing cultural materials (42Gr551, 42Gr553, 42Gr568, 42Gr569 and 42Gr570) were located during the survey. All were wind or water eroded features in the Entrada Sandstone.

Site 42Gr551 in the extreme northwest corner of the survey area (Figure 5) is located in one of the many unmapped intermittent tributaries of Salt Wash. The steep-walled tributary (ca. 40 ft. deep) contained chipping debris along its entire course. Site 42Gr551 was the easternmost of three water-cut caves and the only one found to contain evidence of occupation. An eight-rowed corn cob was recovered from the surface of the deep, sandy, sloping deposits.

Site 42Gr553 is a shallow overhang at the head of Clover Canyon. It contained no deposits and only a few specimens of chipping detritus.

Site 42Gr568 is a water-cut overhang which overlooks quarry site 42Gr565 to the south. The ceiling of the overhang is fire-blackened and at least three hearth areas are visible on the surface of the deposits. Chipping debris and Paiute-Shoshoni pottery were collected.

Open Camps

None of the open camps yielded pottery. In general, those nearest the quarries contained bifaces, Type I and II cores, and a preponderance of thick unmodified flakes. Camps a mile or more from the quarries (42Gr549, 42Gr550, 42Gr575, 42Gr576, 42Gr577) are marked by the absence of the larger specimens and contain projectile points and large numbers of unmodified "thinning" flakes. In fact, four of the five projectile points recovered during the survey came from sites 42Gr575, 42Gr576 and 42Gr577, the three sites furthest from the quarry areas.

The mano and slab metate (left in field) at site 42Gr559 further attests to subsistence activities in the Winter Camp-Salt Wash confluence area.

Historic Petroglyph

As mentioned above, no aboriginal rock art was observed. A historic petroglyph enscribed "J.E.D. 1860" (Figure 9) was found at quarry site 42Gr560. We have not yet been able to identify this individual but he was probably associated with the initial Mormon



Fig. 9 Historic petroglyph.

settlement of the Elk Mountain Mission in Moab, Utah, which began in 1854 (Tanner 1937).

PREVIOUSLY RECORDED SITES

Of the fifty-nine sites previously recorded, nineteen were open camps, thirty-one were cave/rockshelters and one was an isolated petroglyph. In addition, four of the open camps and six of the cave/rockshelters contained examples of rock art. Hunt (1953) recorded eight sites at the southern end of the Park (42Gr192, 42Gr195, 42Gr196, 42Gr204, 42Gr205, 42Gr206, 42Gr207, 42Gr246). The remainder of the sites (marked with open circles in Figure 1) were reported by Pierson (n.d.). Sixteen of Pierson's sites are located within the area surveyed by the Antiquities Section. We revisited only six of these (42Gr294, 42Gr295, 42Gr516, 42Gr517, 42Gr518, 42Gr519). The remainder could not be located. All six are cave/rockshelters cut in the Entrada Sandstone north of Winter Camp Wash. They overlook quarry site 42Gr572 to the south. None was found to contain cultural materials. Either Pierson collected all surface artifacts or the sites have subsequently been "picked clean" by tourists. The latter is a distinct possibility since the paved walkway to Delicate Arch cuts through the center of the quarry (42Gr572) and allows easy access to the cave/rockshelters.

The following summary includes only a few references to specific sites due to the problems of site location and artifact provenience mentioned earlier.

Open Camps

The nineteen open camps are located along the courses of intermittent tributaries of Salt Valley Wash, Courthouse Wash and the Colorado River. They consist primarily of surface concentrations of chipping debris and chipped stone artifacts. Three of the sites yielded Pueblo II Anasazi pottery types. Four contained points described herein (Types I, IV, VI, VII, VIII, XI, XII and XIV). Ground stone implements are

reported at six of these sites but apparently were not collected.

Four sites contained examples of stone architecture: a "crude stone masonry structure" (Pierson n.d.) at 42Gr536; a "low rock circle" (Hunt 1953) at 42Gr192; and small (2 to 4 ft. diameter) circular, slab and coursed masonry "granaries" (Hunt 1953) at sites 42Gr195 and 42Gr196. A wooden beam from the granary at 42Gr196 has been radiocarbon dated to 950 ± 150 B.P.

Except for the Anasazi pottery types, none of the artifacts are diagnostic of specific cultural associations.

Cave/Rockshelters

The thirty-one cave/rockshelters are primarily concentrated along Courthouse Wash, Winter Camp and Salt Valley Washes (Figure 5). Five of the sites contained Pueblo II Anasazi pottery and two sites contained Paiute-Shoshoni ware. Only one of these yielded both types. Five contained point types described herein (Types I, II, III, V, VI, VII, IX, X and XIII). Ground stone implements are reported for ten sites but were apparently not collected.

Four cave/rockshelters described by Pierson (n.d.) contain architectural features: a "D-shaped masonry room" at 42Gr546; a "crude stone retaining wall" at 42Gr542; a "storage cyst" at 42Gr525; and a "small masonry storage cyst" at 42Gr527.

As in the case of the open camps, only the pottery types are culturally diagnostic.

Petroglyphs/Pictographs

Eleven examples of rock art have been recorded in Arches National Park. Reported site associations and available descriptions are summarized below.

42Gr206-207 (open camp): "Petroglyphs include hump-backed flute player" (Hunt 1953).

42Gr288 (open camp): "one petroglyph of maze type" (Pierson n.d.).

42Gr294 (cave): "Petroglyph in red paint (Part missing)" (Pierson n.d.).

42Gr297 (isolated): "Petroglyphs . . . of horses w/riders and goats" (Pierson n.d.).

42Gr513 (open camp): "Petroglyph . . . Photoed by Steward, 1941, mentioned by Hunt, 1953" (Pierson n.d.).

42Gr519 (cave): "Petroglyphs" (Pierson n.d.).

42Gr520 (cave): "Lots of petroglyphs . . . Reported by Hunt, 1953" (Pierson n.d.).

42Gr537 (open camp): "Pictographs" (Pierson n.d.).

42Gr538 (cave): "Pictographs, one showing Delicate Arch which may be modern as game and horse trail runs in front of cave" (Pierson n.d.).

42Gr539 (open camp): "a series of pecked pictographs on north side and one panel of painted on south side" (Pierson n.d.).

42Gr542 (rockshelter): "Goat petroglyphs" (Pierson n.d.).

Obviously, little may be inferred as to the nature of the rock art from these modest descriptive accounts.

ARTIFACTS

Artifact classes include chipped stone, ground stone, pottery and perishables. These have been subdivided into types and described in various degrees of detail. Both the artifacts collected by the Antiquities Section and those obtained by previous surveys are included in this report. However, as mentioned earlier, some doubt exists as to the provenience of the previous collections. All specific references to these artifacts have been marked with an asterisk to indicate to the reader that the provenience may be in error.

Provenience of all specimens is included in the appropriate descriptive sections. The provenience of chipped stone and pottery is also shown in Table I for ease of reference.

CHIPPED STONE

This section is not intended to represent an exhaustive analysis of chipped stone implements. The "traditional" format employed is adequate for the present purposes. Statistical techniques which have been usefully applied to larger collections (Ahler 1970; Binford and Quimby 1963; Calabrese 1972) are inappropriate in this case due to the small sample size. Microscopic analysis of wear patterns has not been attempted for reasons adduced later (see Discussion of Bifaces).

The chipped stone artifacts have been subdivided into nine categories: Points, Drills, Unifaces, Bifaces, Cores, Large Amorphous Flakes, Retouched Flakes and Unmodified Flakes.

POINTS

The point category includes probable arrow points (Types I through VII); probable atlatl points and/or small knives (Types VIII through XII); and large knives (Types XIII and XIV).

Type I

No. Specimens: Six

Description: Small triangular points with straight to convex edges. All examples are side-notched and all but one (Fig. 10b) have a single basal notch. Three (Fig. 10a, e, f) are plano-convex in cross section and display more flake scars on the dorsal than the ventral face. The other three are bi-convex in cross section and are worked equally on both faces. Flaking technique varies from random to fine parallel pressure flaking.

Measurements: Length, 1.8 to 2.5 cm.; width, 1.1 to 1.4 cm.; thickness, 0.2 to 0.3 cm.; weight, 0.5 to 2.2 gms.

Material: Chert

Provenience: 42Gr575 (Fig. 10 a, c); 42Gr538* (Fig. 10 b, d, e); 42Gr299* (Fig. 10 f)

Comparable Types: Aikens (1970), Fig. 18, a-c. Hunt (1953), Fig. 18, a-i. Gunnerson (1969),

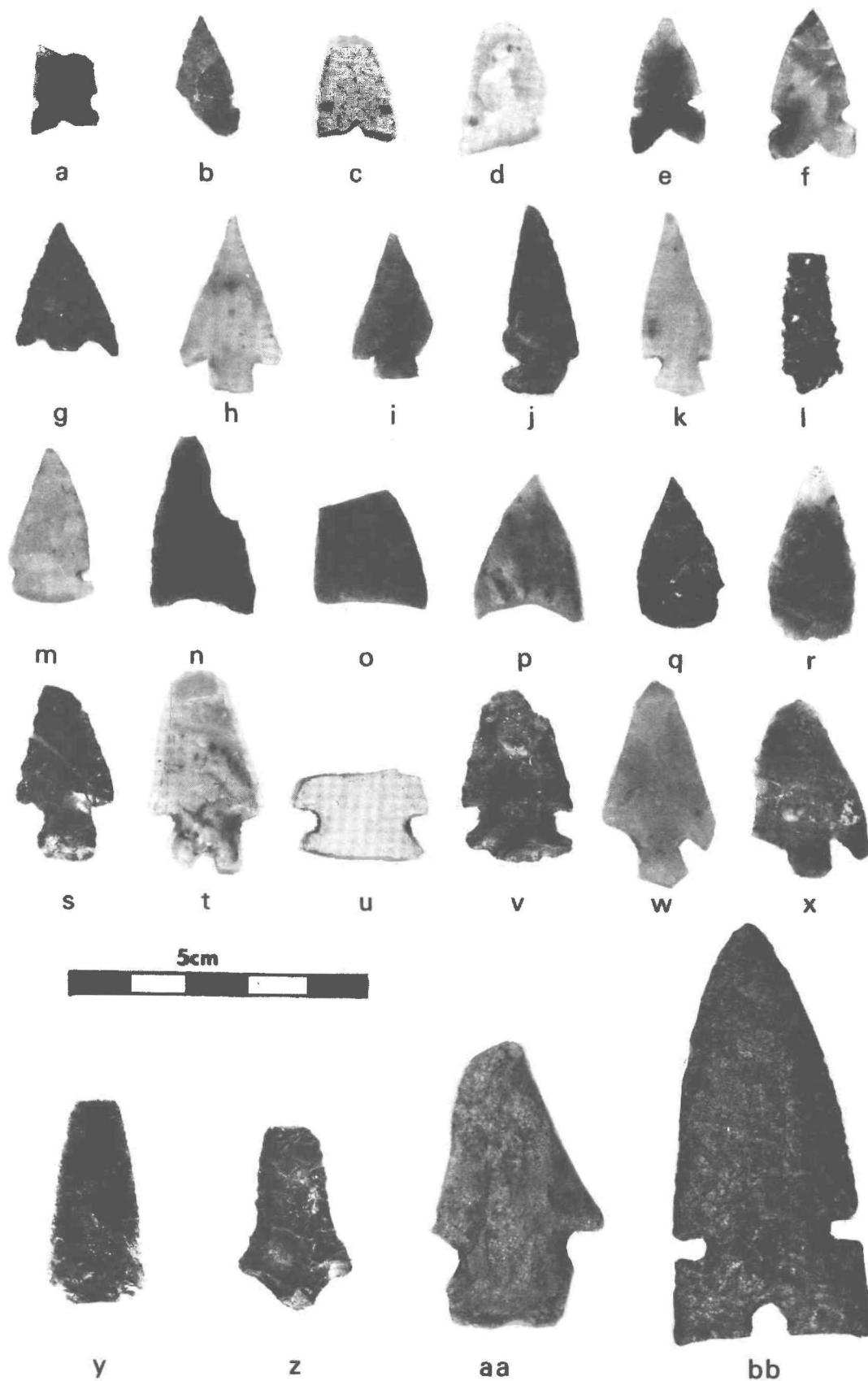


Fig. 10 Chipped stone points from Arches National Park: Type I (a-f); Type II (g-i); Type III (j); Type IV (k, l); Type V (m); Type VI (n-p); Type VII (q, r); Type VIII (s, t); Type IX (u, v); Type X (w, x); Type XI (y); Type XII (z); Type XIII (aa); Type XIV (bb).

Fig. 43, d. Sharrock (1966), Fig. 48, h. Kehoe (1966), Fig. 1

Type II

No. Specimens: Three

Description: Small triangular points with relatively straight edges. All examples are corner-notched with slightly expanding stems. Tangs are sharp and extend ca. halfway to the base of the stem. All are made on curved flakes and are plano-convex in cross section. Dorsal surfaces are worked much more extensively than the ventral. The ventral surface of one (Fig. 10 h) exhibits no flake scars except edge treatment. Parallel to random pressure flaking.

Measurements: Length, 2.3 to 2.9 cm.; width, 1.5 to 1.8 cm.; thickness, 0.3 cm.; weight, 1.0 to 1.4 gms.

Material: Chert

Provenience: 42Gr298* (Fig. 10 g), 42Gr300* (Fig. 10 h), 42Gr577 (Fig. 10 i)

Comparable Types: Aikens (1970), Fig. 18, j-l. Hunt (1953), Fig. 11, e-f. Wormington and Lister (1956), Fig. 40, a-d, Fig. 41, a-f. Brew (1946) Fig. 172, a-g)

Type III

No. Specimens: One

Description: Small triangular point with straight edges and relatively broad, rounded side notches. The base is excurvate in shape and is bifacially thinned. The specimen is bi-convex in cross section and is worked equally on both faces. Random pressure flaking with little or no edge retouch.

Measurements: Length, 3.2 cm.; width, 1.3 cm.; thickness, 0.4 cm.; weight, 1.5 gms.

Material: Chert

Provenience: 42Gr543 (Fig. 10 j)

Comparable Types: Aikens (1970), Fig. 18, d-f. Hunt (1953), Fig. 11 b

Type IV

No. Specimens: Two

Description: Small triangular points, long in proportion to width. Both are stemmed with barbs at right angle to the midline. One (Fig. 10 k) has an expanding stem and slightly excurvate edges. It is made on a curved flake and is plano-convex in cross section. Neither face is worked extensively. The other (Fig. 10 l) has straight serrated edges, is bi-convex in cross section and has fine parallel pressure flaking on both faces.

Measurements: Length, 2.7 to 2.8 cm.; width, 1.1 cm.; thickness, 0.3 cm.; weight, 1.1 to 1.2 gms.

Material: Chert

Provenience: 42Gr536* (Fig. 10 k), 42Gr576 (Fig. 10 l)

Comparable Types: Hunt (1953), Fig. 10, a and c-g

Type V

No. Specimens: One

Description: Small triangular point with shallow side notches. Edges and base are slightly excurvate with bifacial basal thinning evident. Specimen is plano-

convex in cross section and is minimally worked on both faces.

Measurements: Length, 2.4 cm.; width, 1.3 cm.; thickness, 0.4 cm.; weight 1.1 gms.

Material: Chert

Provenience: 42Gr518 (Fig. 10 m)

Comparable Types: None

Type VI

No. Specimens: Three

Description: Small triangular points with marked basal concavity. Excurvate edges and bifacial basal thinning. Lenticular in cross section with random pressure flaking evident on both faces.

Measurements: Length, 2.2 to 3.0 cm.; width, 1.7 to 1.8 cm.; thickness, 0.2 to 0.4 cm.; weight, 1.2 to 1.9 gms.

Material: Chert

Provenience: 42Gr299* (Fig. 10 n-o), 42Gr528* (Fig. 10 p)

Comparative Types: Hunt (1953), Fig. 8, f. Aikens (1970), Fig. 18, m. Gunnerson (1969), Fig. 43, s-t

Type VII

No. Specimens: Two

Description: Small triangular points with rounded bases and slightly excurvate edges. Lenticular in cross section and equally worked on both faces.

Measurements: Length, 2.6 to 3.0 cm.; width, 1.4 to 1.5 cm.; thickness, 0.3 to 0.4 cm.; weight, 1.3 to 2.0 gms.

Material: Chert

Provenience: 42Gr532* (Fig. 10 q), 42Gr539* (Fig. 10 r)

Comparable Types: Aikens (1970), Fig. 18, n

Type VIII

No. Specimens: Two

Description: Large triangular stemmed points with straight edges. Tangs project at right angles to midline. Stems are slightly expanding. The stem of one specimen (Fig. 10 t) is bifurcated by a basal notch. Points are bi-convex in cross section and display random pressure flaking on both faces.

Measurements: Length, 3.0 to 3.4 cm.; width, 1.7 cm.; thickness, 0.4 to 0.5 cm.; weight, 2.3 to 2.5 gms.

Material: Chert

Provenience: 42Gr539* (Fig. 10 s), 42Gr552 (Fig. 10 t).

Comparable Types: Aikens (1970), Fig. 20, m-r. Hunt (1953), Fig. 13, g-j

Type IX

No. Specimens: Two

Description: Large triangular, side-notched points. Bases are straight to convex and bifacially thinned. Side notches are broad, rounded and directed at a slight angle toward the tip. Specimens are bi-convex in cross section and randomly flaked on both faces. Edges have secondary retouch. The tip of one specimen (Fig. 10 v) has an impact fracture.

Measurements: Length, 2.9 cm.; width, 1.9 to 2.3 cm.; thickness, 0.4 cm.; weight, 2.7 gms. (Fig. 10 v only)

Material: Chert

Provenience: 42Gr298* (Fig. 10 u), 42Gr535* (Fig. 10 v)

Comparable Types: Aikens (1970), Fig. 19, e and k. Hunt (1953), Fig. 15, i-l

Type X

No. Specimens: Two

Description: Large, triangular, corner-notched points. One (Fig. 10 w) has short tangs extending toward the base and a slightly expanding stem. It is bi-convex in cross section and is randomly pressure flaked on both faces. One margin has been retouched to form a denticulate edge. The other (Fig. 10 x) is made on a curved flake and cortex is still present on the dorsal face. The single unbroken tang extends nearly to the base of the stem. This specimen is plano-convex in cross section and the ventral face is unworked.

Measurements: Length, 3.0 to 3.5 cm.; width, 1.9 cm.; thickness, 0.4 to 0.5 cm.; weight, 2.2 to 2.6 gms.

Material: Chert

Provenience: 42Gr532* (Fig. 10 x), Unknown (Fig. 10 w)

Comparable Types: Hunt (1953), Fig. 19, h

Type XI

No. Specimens: One

Description: Long, thin triangular point with basal or corner notches (indeterminable since stem is broken). One remaining tang is sharply pointed and directed toward the base. Specimen is lenticular in cross section and exhibits fine, parallel pressure flaking on both faces. Flake scars terminate at the median line.

Measurements: Length, 4.0 cm.; width, 1.7 cm.; thickness, 0.3 cm.; weight, 2.4 gms.

Material: Chert

Provenience: 42Gr540* (Fig. 10 y)

Comparable Types: None

Type XII

No. Specimens: One

Description: Triangular specimen with pointed base and lateral, rudimentary tangs. Blade constricted immediately above the tangs, producing nearly parallel edges. Base below tangs is bi-convex in cross section and much thicker than the blade. Blade is lenticular in cross section and randomly flaked on both faces.

Measurements: Length, 3.5 cm.; width, 1.9 cm.; thickness 0.5 cm.; weight, 2.5 gms.

Material: Chert

Provenience: 42Gr290* (Fig. 10 z)

Comparable Types: None

Type XIII

No. Specimens: One

Description: Large, poorly made side-notched triangular point. Side notches are broad and directed

toward the tip. Edges are very irregular and crudely serrated. Specimen is bi-convex in cross section and displays no flake scars on either face.

Measurements: Length, 4.6 cm.; width, 2.9 cm.; thickness, 0.7 cm.; weight 9.2 gms.

Material: Chert

Provenience: 42Gr298* (Fig. 10 aa)

Comparable Types: None

Type XIV

No. Specimens: One

Description: Finely made large triangular point with excurvate edges. Specimen is side-notched and has a single basal notch. All notches are "keyhole" shaped with the distal (interior) aspect of the notch rounded. The specimen is made on a long, broad, slightly curved blade. It is lenticular in cross section and parallel flaked on both faces. Most of the flake scars terminate at the midline while some extend the entire width of the blade. Blade edges are minimally retouched.

Measurements: Length, 7.0 cm.; width, 3.3 cm.; thickness 0.5 cm.; weight, 11.6 gms.

Material: Chert

Provenience: 42Gr299* (Fig. 10 bb)

Comparable Types: None. This apparently unique point probably served as a hafted knife.

Discussion of Points

Type I is referred to as the Desert Side-Notched in the Great Basin (Baumhoff and Byrne 1959) and the Billings Double Spur Basal-Notched on the Northwestern Plains (Kehoe 1966). This geographically widespread point type has been dated from ca. 650 B.P. to the historic period (Baumhoff and Byrne 1959; Hester 1973). Its posited occurrence at 3000 B.P. in the Hogup Cave sequence (Aikens 1970) was based on erroneous interpretations of the stratigraphic and radiometric data (cf. Madsen and Berry 1975).

Type II is similar to the small corner-notched points associated with the Uncompahgre Complex (Wormington and Lister 1956) and Late Woodland sites (Johnson 1974) between the Colorado Front Range and the Missouri River. It is formally identical to the Great Basin type, Eastgate Expanding-Stem. These points occur as early as 1450 B.P. on the Great Plains (Johnson 1974) and from 1350 to 650 B.P. in the Great Basin (Lanning 1963; Clewlow 1967).

Types III and IV fall within the range of variation of, respectively, Rose Springs Side- and Corner-Notched as defined in the Great Basin (Lanning 1963). The temporal range is the same as posited for Type II.

Type V is a small, poorly made, side-notched point with no discernable parallels. On the sole criterion of size, it is probably an arrow point and, therefore, datable within the gross time span of Types I through IV.

Types VI and VII are usually lumped under the heading of Cottonwood Triangular which is presumably a type of arrow point preform (Aikens 1970).

Types VIII, IX and X are large, triangular points for which temporal placement cannot be posited with

any degree of confidence. Similar specimens have been found in Archaic period (Aikens 1970; Leach 1970; Jennings 1957) and Basketmaker II (Kidder and Guernsey 1919; Guernsey and Kidder 1921; Guernsey 1931; Morris and Burgh 1954) contexts in which they are interpreted as atlatl points. However, they also occur in Fremont and Pueblo contexts, in which case they have been interpreted as (probably hafted) knives (Adovasio 1970; Berry 1972). The rationale for these interpretations is a loosely defined set of partially supportable premises. The large points are frequently found hafted on atlatl dart foreshafts in Archaic period and Basketmaker contexts. While multiple use as cutting and skinning knives must be considered as a possibility (Wylie 1975), their use as projectile points cannot be seriously doubted. Fremont and Pueblo sites are marked by the use of bow and arrow to the total exclusion of the atlatl (Madsen and Berry 1975). In the absence of wear pattern studies, the large points found in these contexts are interpreted as knives since they are considered too heavy to have been used as arrow points. This latter assumption has not been subjected to rigorous experimental testing, but it is an acceptable working hypothesis in most cases. Where Types I through IV occur with Types VIII through X at sedentary Fremont village sites, the latter are typically four to five times heavier than the former (cf. Berry 1972; Wormington 1955; Sharrock and Marwitt 1967; Marwitt 1968; Taylor 1957; Aikens 1967). The problem may eventually be resolved when the burgeoning field of wear pattern analysis transcends its present state of particularism.

Given present knowledge, cultural affiliation and temporal assignation of Types VIII through X cannot be determined from survey collections.

DRILLS

Four specimens have been classified as drills (Fig. 11 a-d). Their morphological differences warrant separate description.

Drill I

Description: This specimen was made on a curved flake. The base is unmodified. The drill portion tapers to a blunt point. It is bi-convex in cross section and bifacially flaked.

Measurements: Overall length, 4.8 cm.; length of drill point, 2.1 cm.; base width, 2.6 cm.; width of drill point, 0.5 cm.; thickness, 0.4 cm.; weight, 3.5 gms.

Material: Chert

Provenience: General surface collection (Fig. 11 a)

Comparable Specimens: Hunt (1953), Fig. 34 a

Drill II

Description: Specimen is long and slender with a flanged base. Base is bifacially worked on all edges. Drill portion is parallel-sided and tapers abruptly to a blunt tip. It is bi-convex in cross section; displays steep retouch on both faces.

Measurements: Overall length, 5.2 cm.; length of

drill point, 3.9 cm.; base width, 2.4 cm.; width of drill point, 0.9 cm.; thickness 4.1 gms.

Material: Chert

Provenience: 42Gr298* (Fig. 11 b)

Comparable Types: Aikens (1970), Fig. 33, d. Hunt (1953), Fig. 34 a

Drill III

Description: This specimen was probably hafted. The base is roughly parabolic in form. It is basally notched to form two short tangs and a stem. The stem is bifurcated. The drill portion is plano-convex in cross section and is unworked on the plane surface. Edges are steeply retouched.

Measurements: Overall length, 5.1 cm.; length of drill point, 3.0 cm.; base width, 2.4 cm.; width of drill point, 0.8 cm.; thickness, 0.4 cm.; weight, 5.1 gms.

Material: Chert

Provenience: 42Gr290* (Fig. 11 c)

Comparable Types: None

Drill IV

Description: Classification of this specimen as a drill is somewhat conjectural, since a large portion of the tip is broken off. The base is roughly oval in shape and bifacially flaked on all edges. The point section is tapered, lenticular in cross section and bifacially flaked on both edges.

Measurements: Overall length, unknown; base width, 4.0 cm.; width of drill point, tapers from 3.3 to 2.3 cm.; thickness, 0.6 cm.; weight, 21.3 gms.

Material: Chert

Provenience: 42Gr299* (Fig. 11 d)

Comparable Types: Apparently a unique specimen.

Discussion of Drills

As the term "drill" implies, this is a functional category. This departure from the primarily descriptive format employed in the present report is justifiable and has clear precedent in the literature of the Southwest, Great Basin and Colorado Plateau. Similar specimens are invariably — probably correctly — referred to as drills since their form appears to be functionally specific.

Drills have been recovered in stratigraphic association with Fremont, Anasazi, and Archaic period cultures and are of no cultural or temporal diagnostic utility.

UNIFACES

Only eight unifacially flaked specimens were recovered. Fig. 11 e and f represent the range of variation from nearly circular to subrectangular in form.

Description: The four subrectangular specimens are unifacially flaked on one edge only. All are plano-convex in cross section and display steep retouch on the worked edge. Neither ventral or dorsal surfaces are extensively flaked.

The four circular to oval specimens are unifacially flaked around the entire circumference. They are plano-convex in cross section. Ventral surfaces are unmodified while dorsal surfaces display multiple flake scars.

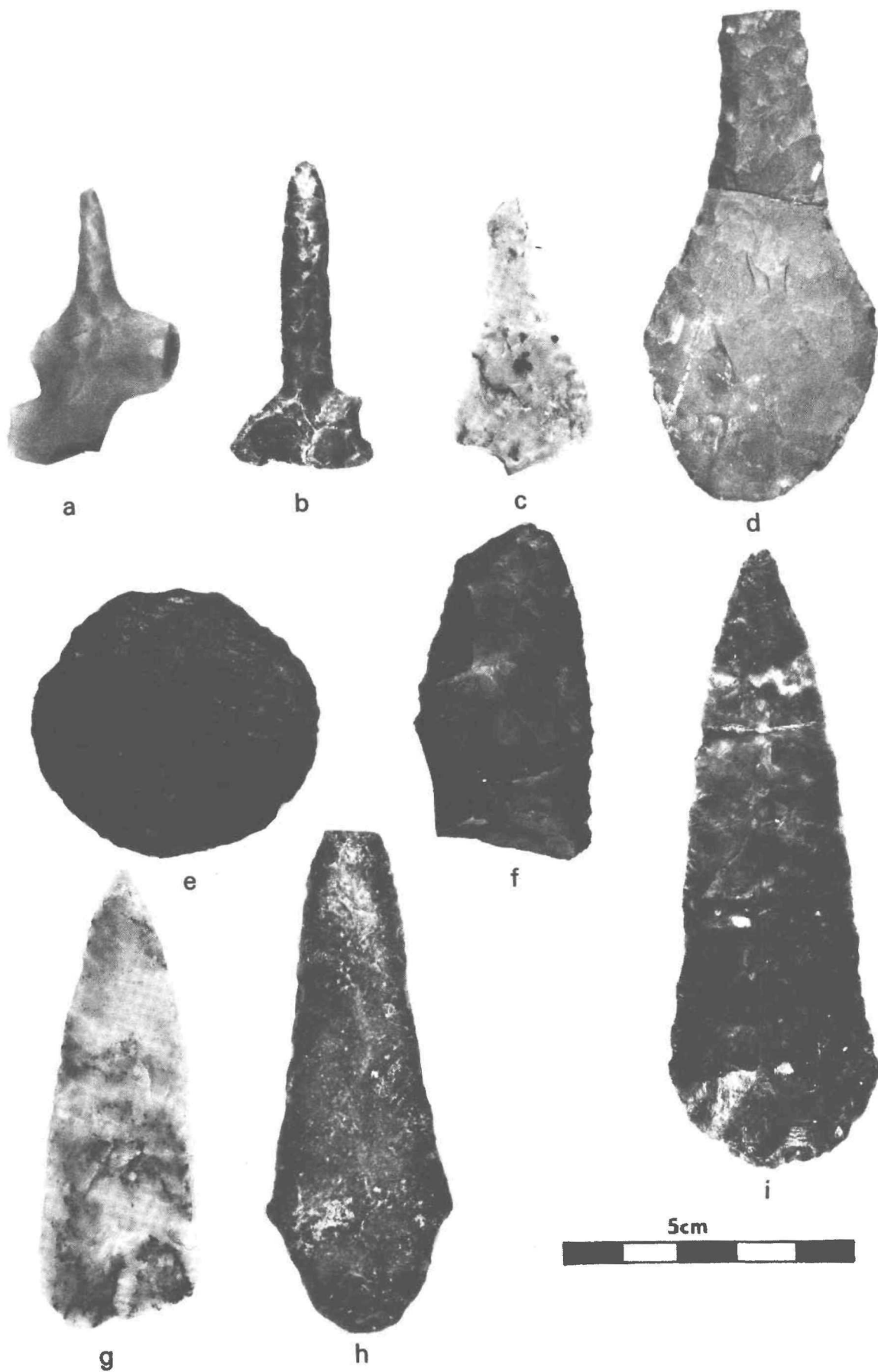


Fig. 11 Chipped Stone: Drills (a-d); Unifaces (e-f); Bifaces (g, h, i).

Measurements: Length, 3.7 to 5.6 cm.; width, 2.5 to 5.0 cm.; thickness, 0.6 to 1.6 cm.; weight, 11.7 to 31.2 gms.

Material: Chert

Provenience: 42Gr298 (3); 42Gr528 (1); 42Gr561 (1); 42Gr556 (Fig. 11 e; General surface collection Fig. 11 f); 42Gr575 (1)

Comparable Types: Hunt (1953), Fig. 44, 54

Similar specimens are usually referred to as "scrapers." The examples from the Arches National Park collection are of no cultural or temporal diagnostic utility.

BIFACES

Eleven specimens not included in the point category make up this class of artifacts.

Description: All examples are triangular in form. Bases vary from square to excurvate. Edges vary from straight to excurvate. Flaking technique ranges from percussion thinning to fine parallel pressure flaking. Cross sections are plano-convex, bi-convex and lenticular.

Measurements: Length, 3.0 to 10.5 cm.; width, 2.0 to 3.3 cm.; thickness 0.4 to 0.9 cm.; weight, 4.0 to 27.5 gms.

Material: Chert

Provenience: 42Gr298* (2) (Fig. 11 i); 42Gr300* (1); 42Gr301* (Fig. 11 h); 42Gr532* (1); 42Gr538* (1); 42Gr554 (1); General Surface Collection (4) (Fig. 11 g)

BIFACE FRAGMENTS

No. Specimens: Twenty-seven

Description: Broken portions of specimens similar to those described in the Biface artifact class.

Material: Chert

Provenience: 42Gr290* (5); 42Gr293* (2); 42Gr298* (6); 42Gr 299* (2); 42Gr532* (1); 42Gr551 (1); 42Gr552 (1); 42Gr556 (1); 42Gr560 (3); 42Gr566 (1); 42Gr570 (1); General Surface Collection (3)

Discussion of Bifaces

These specimens may represent "finished" artifacts used as cutting or skinning tools or, alternatively, they may be "unfinished" preforms. The prevailing view (Crabtree 1972) asserts that the tool/preform distinction can be made on the criterion of distinctive wear patterns on the former and the absence of these patterns on the latter. Such inferences might possibly be applicable to lithic complexes recovered in stratigraphic association. Even then, the distinction cannot be made unequivocally. For instance, a specimen originally "intended" as a preform may have been utilized as a tool and subsequently discarded without being reduced to its final form. Or a "finished" artifact may have been discarded without being used. It is also probable that some tools were used on soft materials that caused no wear patterns whatsoever (Brose 1975). In varying degrees, these problems can be statistically overcome when dealing with large collections

recovered from discrete site components. However, they become insurmountable in a survey context when the collection is small and the specimens cannot demonstrably be assigned to a complex of related artifacts.

Thus, wear pattern analysis of the small Arches National Park surface collection would have been a self-serving exercise and none was attempted.

CORES

Type I

No. Specimens: Nineteen

Description: Generally oval to triangular in form. All are bifacially flaked by percussion. Cross sections vary from bi-convex to plano-convex. Flake scars are broad and deep and show a marked bulb of force.

Measurements: Length, 7.5 to 11.0 cm.; width, 3.0 to 6.2 cm.; thickness, 1.3 to 3.5 cm.; weight, 45.5 to 205.5 gms.

Material: Chert

Provenience: 42Gr290* (1); 42Gr538* (5); 42Gr551 (1); 42Gr552 (1); 42Gr555 (1); Gr556 (2); 42Gr557 (1); 42Gr565 (2); 42Gr565 (2); 42Gr567 (1); 42Gr570 (1); 42Gr572 (1); General Surface Collection (2)

Comparable Types: Hunt (1953), Fig. 57, 58

Type II

No. Specimens: Twelve

Description: These specimens vary from Type I in that the bifacial percussion flaking is more regular and flake scars are smaller. They are smaller in size and considerably thinner.

Measurements: Length, 4.5 to 7.5 cm.; width, 4.0 to 6.5 cm.; thickness, 1.0 to 2.5 cm.; weight, 18.0 to 81.0 gms.

Material: Chert

Provenience: 42Gr290* (1); 42Gr298* (2); 42Gr538* (1); 42Gr552 (1); 42Gr561 (3); 42Gr566 (1); 42Gr570 (1); General Surface Collection (2)

Comparable Types: Hunt (1953), Fig. 59, 60

These specimens are probably "exhausted" cores from which flakes and/or blades were struck in the process of tool manufacture. They are not diagnostic of any particular culture or temporal period in southeastern Utah.

LARGE AMORPHOUS FLAKES

Description: These specimens are large flakes, some of which retain the cortex on one or more surfaces. A few show flake scars with large negative bulbs of percussion. Large amorphous flakes comprise the bulk of the lithic debris at the quarry sites. They conform in all details to what Binford and Quimby (1963) term "shatter;" lithic debris resultant from the initial stages of manufacture or "testing" to determine flaking characteristics.

Material: Chert

Provenience: (The provenience data given here does not represent the true distribution since the quarries were not intensively collected.) 42Gr298* (1); 42Gr552 (4); 42Gr555 (1); 42Gr556 (2); 42Gr561 (1)

RETOUCHED FLAKES

No. Specimens: Fifty-four

Description: These specimens show minimal retouch on one or both faces and presumably were utilized for scraping and/or cutting.

Material: Chert

Provenience: 42Gr290* (6); 42Gr298* (3); 42Gr299* (18); 42Gr528* (4); 42Gr532 (2); 42Gr536 (2); 42Gr538* (2); 42Gr550 (2); 42Gr552 (2); 42Gr555 (1); 42Gr556 (3); 42Gr561 (2); 42Gr566 (3); 42Gr567 (1); 42Gr570 (1); 42Gr576 (2)

UNMODIFIED FLAKES

No. Specimens: 313

Description: Flakes which show no evidence of retouch.

Material: Chert

Provenience: 42Gr290* (2); 42Gr293* (1); 42Gr299* (15); 42Gr528* (2); 42Gr532* (1); 42Gr536* (1); 42Gr538* (3); 42Gr549 (8); 42Gr550 (27); 42Gr551 (19); 42Gr552 (35); 42Gr554 (14); 42Gr555 (6); 42Gr556 (19); 42Gr557 (5); 42Gr558 (9); 42Gr560 (3); 42Gr561 (10); 42Gr565 (11); 42Gr566 (17); 42Gr567 (24); 42Gr569 (2); 42Gr570 (18); 42Gr571 (1); 42Gr572 (11); 42Gr575 (4); 42Gr576 (10); General Surface Collection (35)

HAMMERSTONES

No. Specimens: Three

Description: Two amorphous flakes and one sandstone cobble showing extensive battering marks on one end have been classified as hammerstones.

Measurements: Length, 4.5 to 6.5 cm.; width, 5.0 to 6.5 cm.; thickness, 3.4 to 4.1 cm.; weight, 74.2 to 204.2 gms.

Material: Chert (2); sandstone (1)

Provenience: 42Gr290* (1); 42Gr298* (1); 42Gr572 (1)

GROUND STONE

Only five ground stone specimens were collected during the survey. Four of these are manos. The other is a grinding implement of unknown function.

MANOS

No. Specimens: Four

Description: The two complete specimens are sub-rectangular in shape. The larger of the two (Fig. 12 b) is pecked on all surfaces, but is only ground on one side. The smaller shows no evidence of pecking, but is ground to a smooth surface on both faces. The two fragmentary specimens are river cobbles with one surface pecked and ground.

Measurements: Length, 8.7 to 15.1 cm.; width, 4.5 to 9.0 cm.; thickness, 2.9 to 5.5 cm.

Provenience: 42Gr559 (1); 42Gr560 (1) (Fig. 13 c); 42Gr569 (1); 42Gr570 (1)

PROBLEMATIC GROUND STONE IMPLEMENT

No. Specimens: One

Description: Roughly ovoid in form with three

symmetrically ground faces. Triangular in cross section. Surfaces that do not evidence grinding are pecked.

Measurements: Length, 6.1 cm.; width, 5.0 cm.; thickness, 6.2 cm.

Material: Sandstone

Provenience: 42Gr552 (1)

POTTERY

Of the sixty-one sherds reported herein, fifty-four were recovered during the conduct of a previous survey (Pierson n.d.) and seven were collected by the Antiquities Section. Hunt's (1953) collections from the southern portion of the Park have not been analyzed. Given the range of variation of pottery types, this small sample size precludes anything but gross distinctions. None of the specimens resemble known Fremont types, though Hunt (1953) reports two calcite tempered sherds from 42Gr204 which may be classified as Uinta Gray. The collection at our disposal clearly falls into two distinct wares: Anasazi and Paiute-Shoshoni. As in the case of chipped stone, the bulk of the collection is of questionable provenience and will be marked with an asterisk.

MESA VERDE ANASAZI

San Juan Whiteware: Eight slipped sherds appear to be from bowls. No rimsherds were recovered and the identification as bowl fragments is based on the degree of smoothing of the interior surfaces.

Provenience: 42Gr290 (4); 42Gr536 (2); 42Gr538* (2)

Three additional sherds of San Juan Whiteware are tempered with crushed sherds of an unidentified red-orange ware. Exterior surfaces are smoothed and no design elements are visible.

Provenience: 42Gr538* (3)

Mancos Corrugated: Twenty-nine sherds from six sites are tentatively identified as Mancos Corrugated. All have coarse crushed rock temper. Several sherds show evidence of both corrugation and unaltered coils. A partially restored vessel from 42Gr538* is a spherical, open-mouthed jar with a curved rim (Fig. 12 a).

Interior neck diameter is ca. 12.0 cm. Height could not be determined.

Provenience: 42Gr290* (4); 42Gr298* (2); 42Gr520* (2); 42Gr538* (4); 42Gr532* (4); 42Gr538* (13)

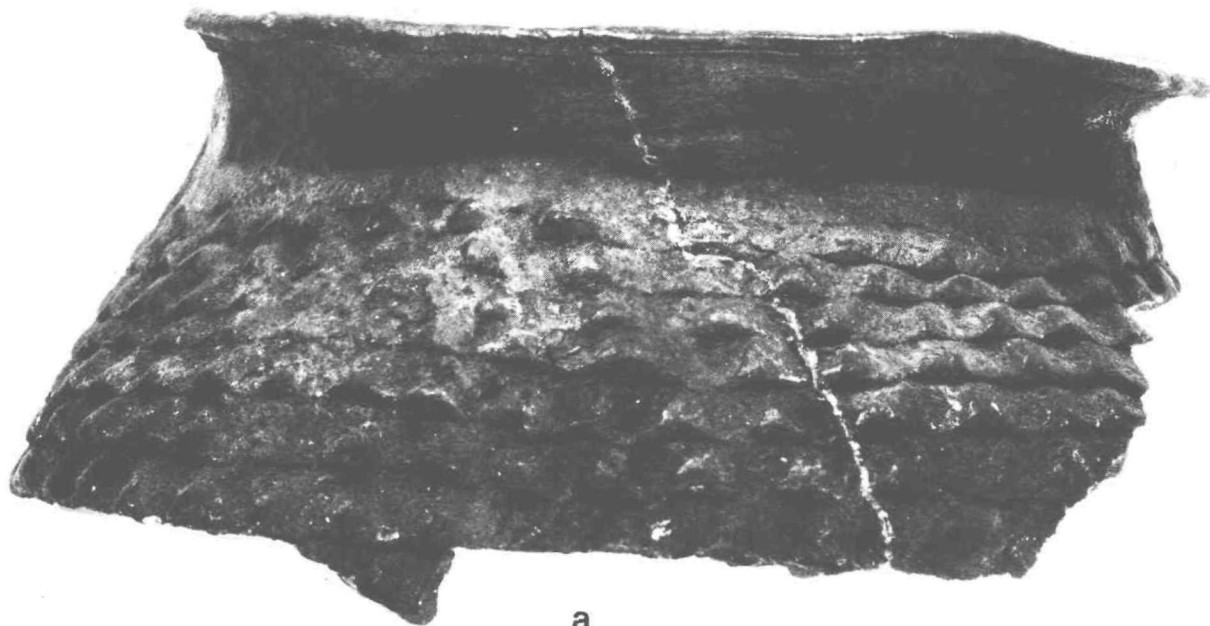
PAIUTE-SHOSHONI

Twenty-three sherds are assigned on the basis of ethnographic data to Numic-speaking groups (Madsen 1975). Temper consists of coarse crushed quartzite. Sherd exteriors are uniformly reddish-brown in color and exhibit fingernail indentations.

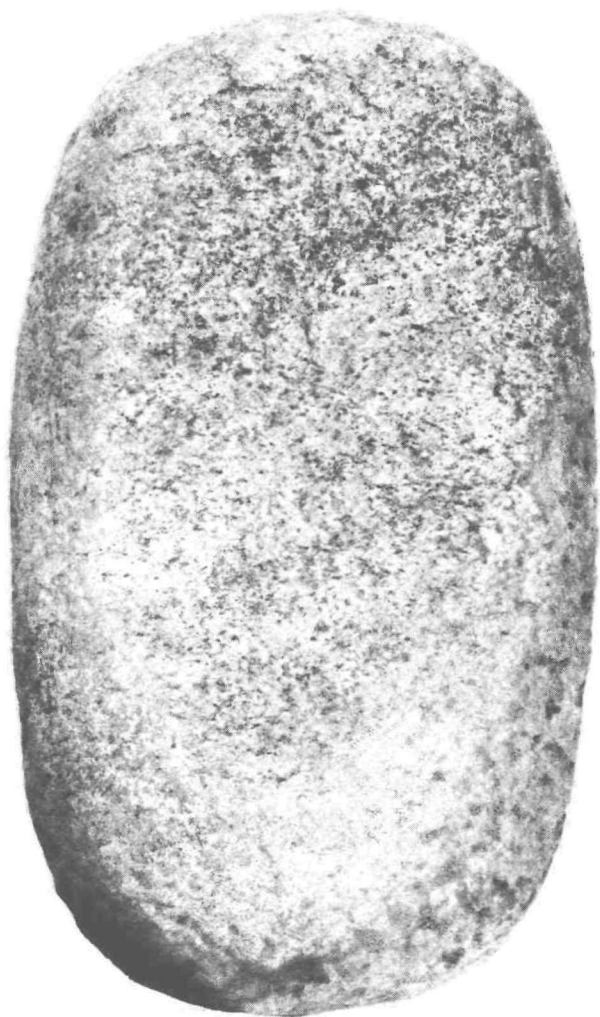
Provenience: 42Gr516* (12); 42Gr538* (4); 42Gr568 (2); 42Gr570 (5)

DISCUSSION OF POTTERY

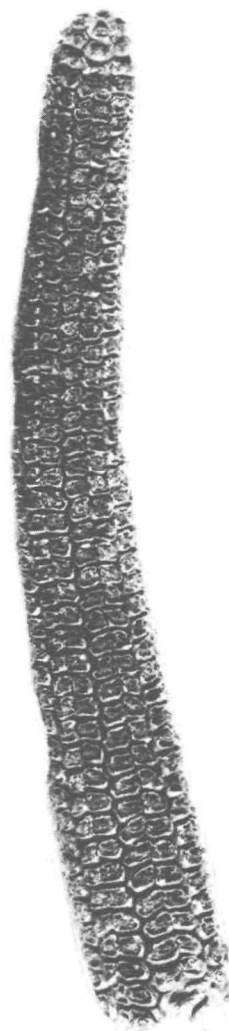
The Anasazi sherd collection is indicative of a Pueblo II occupation. A tentative temporal placement of ca. 900 to 700 B.P. is indicated by tree-ring dated associations in the Four Corners region (Breternitz



a



b



c

5cm

Fig. 12 Pottery, ground stone and corn cob from Arches National Park: (a) Mancos Corrugated vessel (b) mano, (c) eight-rowed corn cob.

TABLE I
Provenience Of Pottery And Lithic Types

Sites for which there are no collections have been deleted.

Sites for which there are no collections have been deleted.

Site Number	Quarries	42Gr552	42Gr555	42Gr556	42Gr557	42Gr560	42Gr565	42Gr572	Open Camps	42Gr290*	42Gr293*	42Gr299*	42Gr536*	42Gr539*	42Gr540*	42Gr549	42Gr550	42Gr554	42Gr558	42Gr561	42Gr566	42Gr567	42Gr571	42Gr575	42Gr576	42Gr577	Cave/Rockshelter	42Gr298*	42Gr300*	42Gr301*	42Gr516*	42Gr518*	42Gr520*	42Gr528*	42Gr532*	42Gr535*	42Gr538*	42Gr543*	42Gr551	42Gr568	42Gr569	42Gr570	
San Juan White Ware										4			2																								5						
Mancos Corrugated										4																		2					2	4	4		13						
Mancos Black-on-white																																					1						
Paiute-Shoshoni Ware																															12			4						2		5	
Type I Points												1												2														3					
Type II Points																										1		1	1														
Type III Points																																							1				
Type IV Points													1												1																		
Type V Points																																	1										
Type VI Points												2																								1'							
Type VII Points														1																						1							
Type VIII Points			1											1																													
Type IX Points																												1									1						
Type X Points																																					1						
Type XI Points															1																												
Type XII Points										1																																	
Type XIII Points																												1															
Type XIV Points												1																															
Drills										1		1																	1														
Unifaces				1																	1				1				3							1	1						
Biface/Preforms		1		1		3				5	2	2		1				1				1							8	1	1					1			1				1
Core Preforms Type I		1	1	2	1		2	1		1													1	1													5		1				
Core Preforms Type II		1								1											3	1							2								1						1
Large Flakes/Cores		4	1	2																		1							1														
Retouched Flakes		2	1	3						6		18	2				2				2	3	1			2			3						4	2		2					1
Unmodified Flakes		35	6	19	5	3	11	11		2	1	15	1			8	27	14	9	10	17	24	1	4	10									2	1		3		19		2	18	

*Denotes Previously Recorded Sites.

1966). However, time/space relationships of Anasazi ceramics outside the so-called "core" areas are poorly understood and this temporal assignation is only a rough approximation.

The temporal placement of the Paiute/Shoshoni pottery is even less secure. The initial appearance of Numic speakers in the area was probably sometime after 650 B.P. (Madsen 1975). Occupation may have occurred anytime between this date and the early historic period. Numic-speaking groups were inhabiting the Moab area at the time of White contact in 1854 (Tanner 1937).

FAUNAL REMAINS

Nine bone fragments were recovered from the sites, only four of which are identifiable.

Mule deer (*Odocoileus hemionus*). Provenience: 42Gr532* (2)

Modern Bovine (*Bovius* sp.). Provenience: 42Gr538* (2)

Unidentified. Provenience: 42Gr532* (3); 42Gr570 (2)

PERISHABLES

Three artifacts normally classified as perishables are found in the combined collection from Arches National Park.

Dart/Arrow Foreshaft: The broken proximal end of an atlatl or arrow foreshaft is reported from 42Gr538*. The fragment is 7.3 cm. long and 0.7 cm. in diameter. It is smoothed and tapered at the proximal end. Eight shallow, parallel lines are engraved longitudinally on its surface. The specimen is made of Mountain Mahogany (*Cercocarpus* sp.).

Arrow Mainshaft (?): A fragment of a possible arrow mainshaft of *Phragmites* sp. is reported from 42Gr516*. The specimen is 17.7 cm. long and 0.9 cm. in diameter. Fletching, nocks and other technological attributes are absent.

Corn Cob (Fig. 12 c): A single cob of eight-rowed corn was recovered from 42Gr551. It is 16.0 cm. long and 2.3 cm. in diameter. Both ends of the cob were pierced to a depth of ca. 2.5 cm. by "skewers" ca. 1.0 cm. in diameter. The "skewers" are not present in this specimen but the holes in the butt ends of this cob suggest similarities to the practice of inserting short sticks in cobs as evidenced at numerous sites in southern Utah and northern Arizona (Winter and Wylie 1974; Fowler 1963; Kidder and Guernsey 1919; Guernsey and Kidder 1921).

CULTURAL AFFILIATION AND CHRONOLOGY

Interpretation of the Arches National Park data must, at present, remain at a fairly low level. Unwarranted speculation would only add to the confusion so evident in the literature of southeastern Utah prehistory.

Consistent with this view, the inferences offered here are limited to what may be justifiably posited on the basis of a small scale survey in a large and poorly understood geographic area.

Pottery types are the firmest evidence of cultural affiliation and temporal span in the Arches collection. Seven of the ten pottery-bearing sites contained Mesa Verde Pueblo II varieties, suggesting that occupation occurred between 900 and 700 B.P. (Breternitz 1966). Unfortunately, all of the Mesa Verde ceramics were recovered by previous surveys and site associations cannot be determined with any degree of confidence. Paiute-Shoshoni ware was recovered from four sites, at least two of which (42Gr568, 42Gr570) are located in the Salt Wash-Winter Camp Wash confluence area. These sites may date anywhere from ca. 650 B.P. to the historic period. Hunt (1953) reports two sherds of calcite tempered pottery from site 42Gr204 at the southern end of the Park. These may be examples of the Fremont type, Uinta Gray, which probably dates from ca. 1350 to 1050 B.P. (Marwitt 1970). However, this classification is subject to change when and if Hunt's collection is reanalyzed in terms of currently accepted definitions of Fremont pottery types (R. Madsen n.d.). Whatever the outcome, two sherds of pottery do not demonstrate Fremont occupation.

Side-notched and corner-notched points within the size range usually associated with bow and arrow technology were found at both pottery and nonpottery-bearing sites. Corner-notched arrow points are associated with Pueblo I artifact assemblages in the Four Corners area (Brew 1946) and also with the aceramic Uncompahgre complex as defined by Wormington and Lister (1956) in the central Utah-Colorado border area. The presence of these points may relate to seasonal hunting activities of Pueblo I agriculturalists or occupation by Uncompahgre hunter-gatherer groups. The total absence of Pueblo I ceramics argues in favor of the latter although the small sample size militates against a strong case for either alternative. Side-notched arrow points were prevalent during the Pueblo II period (Brew 1946) and their occurrence in Arches National Park is compatible with the ceramic data.

Occupation by Basketmaker II and/or Archaic period cultures cannot be unequivocally demonstrated. Both culture periods predate the introduction of the bow and arrow and are thus characterized by the use of the atlatl. Judging from Hunt's (1953) La Sal Mountain collections, the dominant Archaic period dart points in the Arches vicinity were Pinto and Gypsum types. Since none of these have been recovered from the Park, it is reasonable to infer that any dart points in the collection are assignable to Basketmaker II. However, as discussed earlier, the designation of the large triangular specimens (Types VIII through XII) as projectile points is conjectural. The only supporting evidence for this functional designation is the apparent impact fracture on the tip of the large side-

notched point recovered from 42Gr535* (Fig. 10 v).

The "skewed" corn cob from 42Gr551 reflects a practice common in Basketmaker II and early Fremont contexts. The absence of Fremont pottery and the possible occurrence of atlatl technology suggests a Basketmaker II affiliation. This is, admittedly, less than incontrovertible evidence.

In sum, the meager data suggest an occupational sequence for Arches National Park consisting of Basketmaker II, Pueblo II and Numic-speaking populations. Possible utilization by Uncompahgre related groups must also be considered. There is no evidence of Archaic period, Pueblo I or Pueblo III cultures and the case for Fremont occupation is exceedingly weak. Mesa Verde Pueblo II pottery types are the most frequently occurring diagnostics. This affiliation is supported temporally by a radiocarbon date from 42Gr196 of 950 ± 150 B.P. (Hunt 1953).

Barring paleoclimatic conditions radically different than those witnessed in modern times, it is within the realm of reasonable inference to posit that the resources of Arches National Park were exploited only

on a seasonal or intermittent basis. The specific floral and faunal resources that may have been available can only be determined through excavation. Even when this is known, the adaptive implications will only be comprehensible if considered in relationship to subsistence activities at contemporaneous sites outside the Park. For example, the small Pueblo II open camps may indicate seasonal hunting and gathering activities by groups primarily dependent on agricultural yields in the adjacent Castle and Spanish Valleys to the south. Hunt (1953) reports numerous — presumably agricultural — village sites containing Pueblo II pottery types in these valleys. This posited relationship is, of course, only an educated guess. Inferences regarding the intricate details of seasonality and scheduling (Flannery 1968) require more subsistence related data than is currently available. The point is, that the Park was probably never the locus of year-round habitation, hence, any research design arbitrarily limited by Park boundaries will undoubtedly prove inadequate.

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