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PRECERAMIC AND CERAMIC CULTURAL PATTERNS
IN NORTHWEST VIRGINIA

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PREFACE

This report is dedicated to Clifford Evans, associate curator, division of archeology, United States National Museum, and to his wife, Betty J. Meggers, research associate, Smithsonian Institution. Not only did they teach me the essentials of archeological methodology and theory, but they also had a hand in the mundane task of digging some of the sites in the study. Further, they read several versions of the manuscript and advised numerous alterations and suggestions which have been incorporated. Dr. Evans classified all the pottery; Dr. Meggers prepared the drawings of the maps and seriation charts.

Thanks are also due Henry W. Setzer, Joseph P. E. Morrison, and Herbert W. Friedmann, of the divisions of mammals, mollusks, and birds, respectively, of the United States National Museum, for their identifications of shells and bones.

For companionship and aid in the field, appreciation is expressed to Roy Roby of Staunton, Va., and to my family—my wife Louise, and my children, Peter and Cary.

I am indebted to Mrs. Carol Colby for typing two versions of the manuscript.

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PRECERAMIC AND CERAMIC CULTURAL PATTERNS IN NORTHWEST VIRGINIA

By C. G. HOLLAND

INTRODUCTION

The survey of Augusta, Bath, Highland, Rockingham, and Rockbridge Counties, Va., began in November 1950 and continued through August 1952, although some sites had been visited in previous years. Staunton, centrally placed in Augusta County, was the base for fieldwork throughout the entire survey, which undoubtedly accounts for the disproportionately large number of sites reported from this county. Fifty-one sites were identified in Augusta, 14 in Rockingham, 9 in Highland, 7 in Rockbridge, and 1 in Bath, a total of 82. The accumulated material from all sites amounted to 2,425 potsherds, 3,325 projectile points and large blades, 257 other artifacts, and 8,715 chips. Perishable items, such as bone and shell, were encountered at only six sites.

All the collections represent surface materials, although excavations were attempted. Four rock shelters were excavated, but at none was the cultural debris found in sufficient depth to be usable in stratigraphic analysis. Two middens were test pitted, but the material was found to be homogeneous from top to bottom. Two sites on open fields were tested for depth, and at neither was the evidence of occupation greater than 8 inches, or about the depth of the plow zone. Four mounds were tested with incomplete results. At two, East Mound (AU-35-M) and Lewis Creek Mound (AU-20), burials were encountered, but an insufficient number of artifacts were recovered to be statistically usable in this study. The Clover Creek Mound (HD-9) was tested with two small pits without productive results. Since Fowke (1894, pp. 31-32) had dug this mound, an appeal to the United States National Museum was made for analysis of the pottery, and this was supplied. As Fowke's excavation leaves the data on provenience of the potsherds a matter of conjecture, they had to be treated as a unit as if they had come from the surface. Limited testing in the Hayes Creek Mound produced only fragments of human bones.

Interested individuals were most helpful throughout the study. Virginia farmers willingly offered permission to trespass and often helped to collect material. Howard MacCord, who had lived near Greenville in Augusta County for several years, offered his data freely. A considerable number of the sites discussed in the section "Site Descriptions" (pp. 12-43) had been originally located by MacCord. Some of these are published for the first time, and in several instances the data and material he collected comprise the only information about the site. Roy Roby located and collected much of the material from AU-45. He is also responsible for bringing to my attention two rock shelters, AU-27 and AU-28, and the artifacts on display at Natural Chimneys, a widely known tourist attraction. W. H. Plumb of Waynesboro had collected from AU-9 for many years but, regrettably, could positively identify only two objects from the site in his extensive collection.

The early archeological literature of northwestern Virginia, provided largely by Fowke and Valentine, might have been more helpful if the survey had continued over a longer period of time, i. e., 5 to 10 years. The Gala site (Fowke, 1894, pp. 17-23) is now under sod as the lawn of a power station. I was not able to relocate the Wallace Mounds in Highland County and did not visit the very productive Linville site in Rockingham County (*ibid.*, pp. 37-44). The Keyser Farm site (Manson, MacCord, and Griffin, 1944) has already been the subject of an excellent report, but MacCord states that a fair portion of the total site remains to be dug. The Koiner Mound in Augusta County (Valentine Museum, 1898, p. 58), represented by fragments of bone and a right-angle chlorite pipe at the Valentine Museum, Richmond, Va., appears to be lost forever for lack of data. Material from the Hayes Creek Mound in Rockbridge County (RB-2) is represented mainly by skeletal material, an obtuse-angle chlorite pipe, a similar one of clay, shell beads, and a few quartzite specimens. Sherds from this mound, reported by Valentine (Valentine Museum, 1903), could not be located at the Museum. The pottery at the Valentine Museum from the Battle or Bell Mound No. 1 (RB-7) in Rockbridge County was sufficiently documented to study and has been incorporated in this report.

As potsherds, projectile points, and miscellaneous artifacts were brought from the field they were washed, numbered with India ink, and then analyzed. The analysis was recorded on data sheets and the material stored by site in separate containers. The chips were sorted into rock types, recorded by type and site, and then discarded. At first, outline drawings of stone artifacts were made to accompany each site description; however, as soon as types were established, the drawing of each of these objects was discontinued. All sites

were plotted on United States Geological and Geodetic survey quadrangle maps, described in detail in a field notebook and mapped by sketching.

For final analysis most of the data were collected in the statistical tables (see Appendix, p. 90). Some sites were unproductive and the few data they provided, while enlarging the scope of the survey, are not usable in the quantitative comparisons but are recorded for future comparative use. The major portion of the materials of this study was presented to the division of archeology of the United States National Museum, Washington, D. C.

The report is divided into several distinct sections: Introduction, geographical description of northwest Virginia, site descriptions with an explanation of the grouping of the sites with related features and artifacts into distinct categories, the analysis of the projectile points and blades, a study of miscellaneous artifacts, the classification and analysis of the sherds, an analysis of the rock material, the habitation patterns with reference to the geographical situation and possible changes through time, and the relationship of the sequences of northwest Virginia to the surrounding area. All the supporting data for the classifications and seriation studies are in the Appendix arranged by site for easy reference in tables 6 and 7. Although all the stone artifacts were classified by the author, the sherds were classified by Clifford Evans following the types established in his ceramic study of the archeology of Virginia (1955).

Since the theory behind cultural change has been handled many times and the methods by which the archeologist can demonstrate this depend on the nature of the sites, the artifacts available, etc., and as the nature of this paper is not a theoretical one but rather an effort to add more archeological information to a portion of the East which to date has been sadly neglected by professional archeologists, these points of methodology and theory will not be explained here, except where it is essential to the understanding of a particular situation. For those students interested in these factors, reference is made to the recent study of Clifford Evans, "A Ceramic Study of Virginia Archeology," with an Appendix, "An Analysis of Projectile Points and Blades," by C. G. Holland (1955). Here a full explanation of classification and seriation is given, with bibliographic references.

GEOGRAPHICAL DESCRIPTION OF NORTHWEST VIRGINIA

Virginia, geographically a member of the Middle Atlantic States, is usually considered archeologically as the "Southeast," or that region roughly outlined by the Ohio River to the north and the

Mississippi River to the west. In common with the geography of States from Maryland through Georgia, there are three physiographic zones, which, from east to west, are the tidewater plain, the rolling Piedmont section, and the mountains. The tidewater section extends from the Atlantic coast to the fall lines of principal rivers, roughly defined by the northeast-southwest position of Washington on the Potomac, Fredericksburg on the Rappahannock, Richmond on the James, and Weldon, N. C., on the Roanoke River. The Piedmont, composed of low rounded hills, extends from this line to the mountains. In Virginia the eastern mountain range, the Blue Ridge Mountains, extends the entire length of the State in a northeast-southwest direction. West of this range are numerous ranges, peaks, and valleys of the Alleghenys which extend over West Virginia, Tennessee, and Kentucky.

The area of study is west of the Blue Ridge Mountains in the northwest portion of the State, and covers an area roughly 50 miles north and south and an equal distance east and west. In the northern part of the survey area, three rivers, the South, Middle, and North, unite at Port Republic in Rockingham County to form the South Fork of the Shenandoah River. This river joins the North Fork 50 miles to the northeast, whence the main stream continues northeastward to Harper's Ferry where it unites with the Potomac River. The South, Middle, and North Rivers drain the eastern and northern part of Augusta County. The southern and western part of Augusta County is drained southward by another South River and the Calfpasture River. These rivers flow through Rockbridge County into the James River.

It should be made clear that there are two South Rivers. They will be identified by placing after each, in parenthesis, whether they flow into the James River or into the South Fork of the Shenandoah River. However, a study of the occupational complexes on these two South Rivers, arising a few miles apart and flowing in opposite directions along the western foot of the Blue Ridge Mountains, has shown a well-defined homogeneous preceramic horizon related to both of them. For this reason the area through which these rivers flow is called the "South Rivers District."

West of Augusta County, between it and West Virginia, is Highland County, so called because it is completely permeated by the Allegheny Mountains. In the northern tip of this county are some sources of the Potomac River, but the major portion is drained into the James River by the Cowpasture, Bullpasture, and Jackson Rivers. South of Highland County on the West Virginia line is Bath County. East of Bath and south of Augusta County is Rockbridge County. The

major streams cross this county flowing generally southeastward to unite with the James River.

There are two general types of terrain encountered in the survey area. The central and northern portions are composed of broad valleys and rolling land at about 1,000 feet above sea level. The western and southern portions have narrow valleys and are considered mountainous, with peaks reaching 2,000 and 3,000 feet above sea level. Local traditions and historic events, such as massacres, indicate that no physical feature acted as a barrier to Indian parties traveling north and south and coming from the west. There are no records of migrations from east to west of the Blue Ridge Mountains, but there is some indication that in the early 1700's Indians crossed the Blue Ridge Mountains from the west.

The entire section west of the South Rivers district is underlain with limestone and shale which belong to various geologic ages. In this region, which begins abruptly west of the South Rivers district, are numerous caves, some of them as large as Grand Caverns at Grottoes in Rockingham County. Although several caves outside the survey area contained burials, there appears to have been very little use made of them in aboriginal times in the five counties under study.

A knowledge of the rock types available in northwest Virginia is of significance, for it has considerable bearing on the study of the chips from the various sites. In this area the rocks of main archeological importance are chert and quartzite. The former exists either as blue, blue-gray, or gray inclusions or as strata in the limestone. Along the eastern slope of Mill Mountain west of the Calfpasture, natural spallings of chert are profuse. Strata of purple Erwin quartzite were not seen, but numerous boulders were observed in the vicinity of Rockbridge Baths and Goshen in Rockbridge County. White quartz was observed infrequently in strata throughout the entire survey area. In the South Rivers district on the northwestern slope of the Blue Ridge Mountains there are tall cliffs of gray to yellow-gray Erwin-Antietam quartzite. Butts (1940, p. 39) states that this type occurs only along the northwestern flanks of the Blue Ridge. In the area under study the main mass appears to have been a thoroughly sorted, clean white beach sand. The grains are completely cemented with silica to form a compact quartzite. Higher on the slope of the Blue Ridge Mountains are strata of greenstone, the color ranging from bluish, through gray-green to a relatively bright green.

In summary, the most unobstructed avenues of travel geographically have a northeast-southwest course. This is generally the pres-

ent-day axis of western North Carolina and eastern Tennessee and Kentucky on the southwest and western Maryland and Pennsylvania on the northeast. Traditionally, the historic Indians frequently utilized paths in this direction as opposed to the much more rugged treks east and west over the mountains. Bottomlands, enclosed by the mountains, are fertile; water is plentiful and many streams are large enough to float canoes or dugouts satisfactorily. Certainly, the raw materials for the aboriginal manufactures are near at hand: clays for pottery; sand, limestone and other rocks for tempering materials; quartzite, chert, and quartz for blades and points; greenstone for axes and celts; and steatite is available immediately east of the Blue Ridge Mountains. One may expect from the geography of the region that the local settlements and their preference for certain local materials for artifacts were more easily influenced, either by migration or diffusion, from the northeast or southwest. However, this does not mean, as will be shown, that geography alone determined the spread of cultural influences within the area under study, although it is a factor which must be kept in mind throughout the entire report.

SITE DESCRIPTIONS

(Fig. 1)

INTRODUCTION

Sites were lettered and numbered serially after the custom of the River Basin Surveys. A list of Virginia county abbreviations had been prepared by Howard MacCord in conjunction with Carl Miller when the latter began his survey in the Buggs Island Reservoir. This system was published (MacCord, 1947) and is followed here: Augusta County is AU; Bath County, BA; Highland County, HD; Rockingham County, RM; and Rockbridge County, RB. As each site came under observation it was numbered sequentially, i. e., AU-1, AU-2, etc. Four exceptions were made to this standard procedure where it was necessary to separate cultural complexes through study of several adjacent areas. On the East farm, near Churchville, a mound, AU-35-M, and two village sites, AU-35-V-1 and AU-35-V-2, were finally identified as separate entities. At RM-4 a ceramic complex was initially observed. Later it was determined that a peripheral portion of the ceramic complex extended through an unplowed zone and intermingled with a preceramic horizon. The area having a mixture of cultures was designated RM-4A. Still later a circumscribed, isolated preceramic complex was located at a distance west of RM-4A and this was designated RM-4B. A circumscribed ceramic complex was isolated in a large preceramic site RM-1

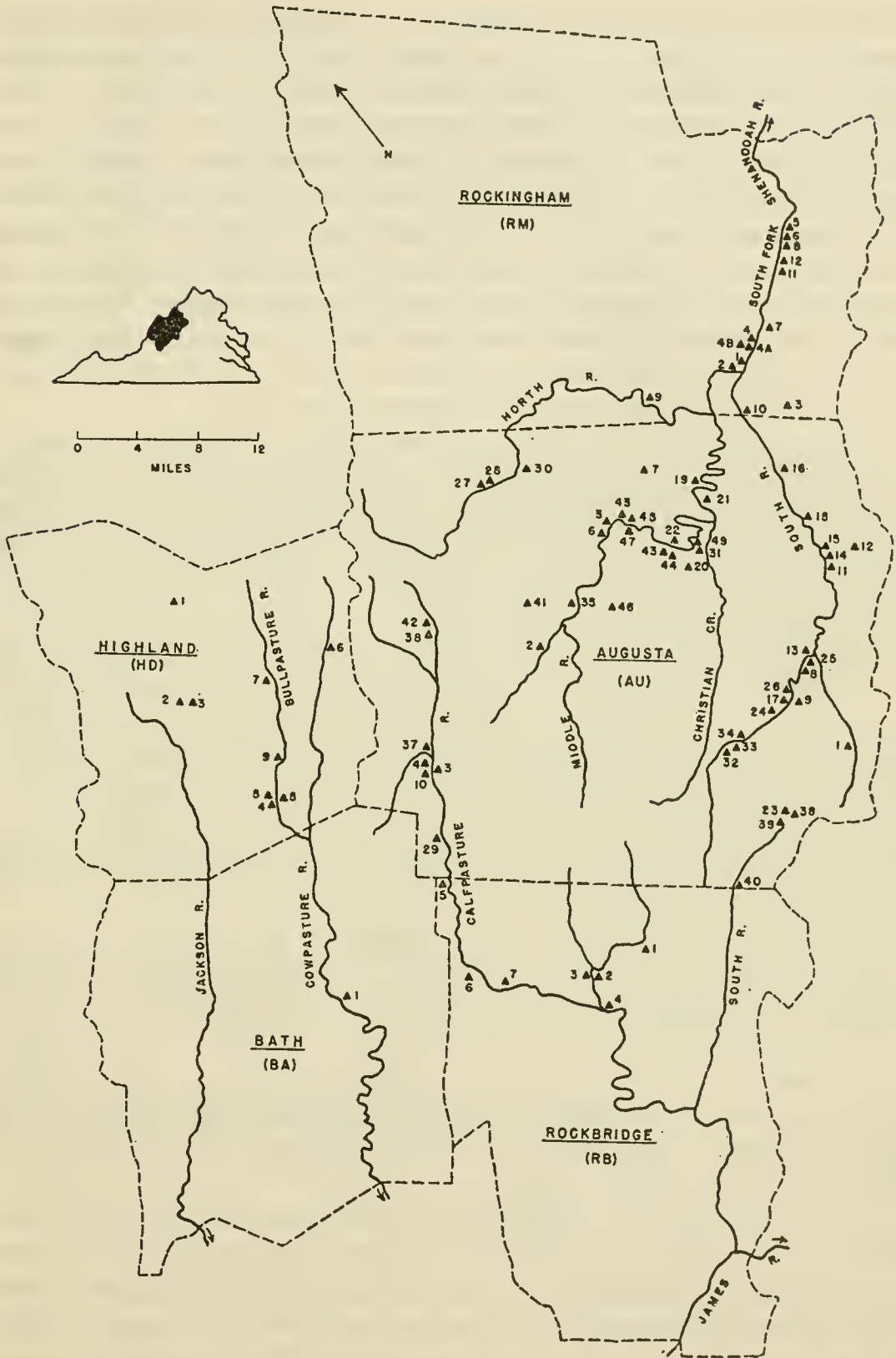


FIGURE 1.—Geographical location of all the sites in the survey.

and was designated RM-1A. Finally a rock mound and a preceramic site, AU-3, were found in close apposition; the mound was designated AU-3A.

It was impossible to give longitude and latitude with sufficient accuracy to be of use in relocating sites; therefore it was necessary to find suitable landmarks from which to measure distances and give directions. The nearest distances were measured on United States Geologic and Geodetic Survey Quadrangle maps from relatively permanent landmarks. Wherever distances were measured from towns the present-day nearest boundary line was the point of reference. Directions have been given according to points of the compass, not mere estimates of general direction. Wherever possible, local landmarks and State highways were used to fix the position of a site. The highway numbers have been taken from county maps prepared by the Virginia Department of Highways, Richmond.

Owing to the limitations placed upon archeological work in heavily cultivated areas, it is not possible to reconstruct exactly the original extent of any occupational area, and the dimensions given here are the best obtainable under such conditions. Local features such as roads, grasslands, forest, and underbrush often have obscured and foreshortened the limits of many sites.

The oldest preceramic sites are readily identified by the popularity of quartzite, and for this reason preceramic "quartzite-using" station has been used to designate sites in this cultural horizon. Sites of a second, but more recent preceramic horizon, associated with high percentages of chert, have been called preceramic "chert-using" stations. These should be interpreted as devices appropriate to this report only; they may or may not have meaning outside the northwestern section of Virginia.

From time to time in the site descriptions the terms "terrace" or "river terrace" will be used. This does not necessarily have the same meaning a geologist would give these terms. They are used to denote a level, elevated belt, or narrow plain, higher than the riverbank and removed from it. A sloping bank elevates the "terrace" from the lower land and usually parallels the present-day course of the river. In many instances the banks of these terraces may have been the banks of old stream beds.

A few sites have exceptionally small assemblages of artifacts. There are two reasons for this: (1) Failure to visit a site many times over a longer period than the 2 years of the study; and (2) the ground being unsuitable for surface collecting owing to heavy pasture, lack of cultivation, and similar circumstances. The same sites, under more agreeable conditions or seen over a longer period, may well provide adequate material. Other small sites may not have been occupied long enough for a greater amount of refuse to accumulate. These sites may take on importance in future studies, but even in this survey they lend scope to patterns set by more productive sites.

All sites in this research project, regardless of the size of the collection, are plotted on figure 1.

The artifacts from each site, classified into their various types and rock material, as well as the sherds classified into the pottery types for Virginia as established by Evans (1955), are listed in tabular form in the Appendix, tables 6 and 7. It was felt that such a method of tabulating the classified material in one section was more useful to the interested student than scattering such information throughout the report. Only those sites with *exceedingly* small collections are eliminated from the tables and are mentioned under the site descriptions only.

AUGUSTA COUNTY

AU-1 is located 8 miles south of Waynesboro on the left (west) bank of Back Creek, between the creek and State Highway 664. It is 200 yards north of a wrought-iron furnace of Civil War vintage. As a result some fragments of furnace slag resembling obsidian are intermingled accidentally with the aboriginal cultural debris. The site is situated on a 15-foot terrace midway between the road and Back Creek, which are 100 yards apart. The area over which the artifacts were found is 25 to 30 yards in diameter.

This site was discovered by Howard MacCord, and with him the author visited it in 1947. The land had been plowed at that time, and we were able to determine the nature of the occupation. Cores and large percussion-made chips of quartzite were much more abundant than smaller pressure-flaked chips. There was a minor quantity of quartz and chert chips. This study was not in progress at that time so no chip count was made. Since then the ground has been so overgrown with grass that it has been impossible to form a new collection, thus only 31 points and blades were available for study.

AU-1 is typical of the preceramic "quartzite-using" stations of the South Rivers district in which it is located.

AU-2, *Buffalo Gap* (see also Evans, 1955, p. 10), is a rock shelter, 200 yards inside the George Washington National Forest. It is located 8.5 miles west of Staunton, in Buffalo Gap, and 15 yards from the left (north) bank of Buffalo Branch, a tributary of Middle River. United States Highway 42 is between the stream and shelter. The shelter has been formed in a north-south quartzite stratum which protrudes from the side of Little North Mountain at an angle of 45 degrees. It is approximately 30 feet long, 8 feet deep, and 6 to 10 feet high along the entrance. The floor rises at a 15-degree angle from the road, is strewn with boulders and has a series of small, level, rain-washed, sandy areas. All material came from the surface in the

sandy areas or between the boulders; the sample consists of 52 chips, 47 potsherds, 10 projectile points, and a few unidentifiable fragments of shell and bone.

AU-3, as well as *AU-4* and *AU-10*, are all 1.5 miles southwest of Deerfield, a small village in western Augusta County. The site is on the left (east) bank of Calfpasture River, 75 yards downstream from Daddy Run which enters the river on the same side. *AU-3*, 20 by 30 yards in extent, lies on a 2- to 3-acre bottomland, 8 feet above normal water level. The area was in sod at all visits, but in eroded patches a few chips and two points were found. No pottery was seen, and the predominance of chert among the chips indicates the position of the site in time as the preceramic "chert-using" period.

AU-3A. Fifty yards from the bank an irregular ridge parallels the river and rises 20 to 25 feet above the bottomland. Previously a small rock mound was on this ridge, 100 yards southeast of *AU-3*. It had been dug into by owners of summer "camps" scattered along Calfpasture River. Dr. Richard Bell, Jr., of Staunton, who reported the mound, says he had dug there and recovered only a few chipped-stone artifacts.

In recent years the mound has been bulldozed from its original position toward the east onto that side of the ridge nearest Daddy Run. In eroded spaces where the mound had stood, 89 chips were collected but no evidence of other artifacts or pottery.

The high percentage of chert places *AU-3A* as a preceramic "chert-using" station in the area of the mound.

AU-4 is 0.3 mile west of *AU-3*, but on the right (west) side of Calfpasture River. It is also 0.3 mile from the river with its eastern extent bounded by an unnamed creek. This creek parallels Calfpasture River for a mile after leaving Shenandoah Mountain to the north, and enters Calfpasture River below Corbett Branch which enters the river from the opposite (east) side. The site covers 3 to 4 acres of wide bottomland but occupational debris is concentrated along the unnamed creek. The bottomland has a series of low terraces and *AU-4* is situated on the terrace farthest removed from the river. It is about 3 feet above the next terrace toward the river. Local collectors have observed that artifacts are not usually found near the riverbank but on these terraces, removed from the river.

This site is typical of the preceramic "chert-using" period. The majority of the rock material is blue chert, available in quantity on mountainsides nearby. Two collections were made 5 months apart from different portions of the site. They include 147 points or blades, 468 chips, 2 celts, and 2 drills. By coincidence, exactly the same number of chips, i. e., 234, were collected on each visit. No pottery

was found at any time, although conditions for surface collecting were ideal.

AU-5 is 4.5 miles north of Staunton. Two local points for closer reference are Shutterly's (or Frank's) Mill on the right (south) bank of Middle River, 100 yards west of *AU-5*, and the State Highway 732 bridge crossing the river at its western limit. Occupational debris is concentrated on the left (north) bank 75 yards downstream from the bridge. Floods have washed away 12 to 18 inches of yellow, sandy topsoil and exposed a reddish-brown subsoil 10 to 15 yards adjacent to the river. River rocks, trash, and artifacts had accumulated into small piles and the majority of the reported material was troweled from these piles. The materials collected include 113 points and blades, 309 chips, 86 sherds, 2 drills, 2 celts, 4 scrapers, 2 steatite fragments, a few cores and fireburnt stones. Undoubtedly much, if not most, of the site lies under the cultivated field too deep to be touched by plow and too far from the river for flood erosion. Relatively few artifacts have been found in the cultivated field.

AU-6 is a rock shelter 1 mile west of *AU-5* on the left (north) bank of Middle River. The floor of the shelter is 25 to 30 feet above the river. Only 1 potsherd was found; no other artifacts occurred.

AU-7. Quick's Mill, a very small community, is situated at the intersection of State Highways 626 and 612. One mile north of Quick's Mill on a small stream, known as Spring Run, is an abandoned marl quarry. The late Mr. Jordan, with his hired man, initially developed the quarry with shovel and sifter, saving the Indian "relics" caught by the sifter. Today, Mr. Jordan's daughter, a Mrs. Carroll, has them stored in her home, "Stone House," adjacent to the quarry. She made available for study the artifacts she could find at the time of my visit to the site. There were 12 sherds, 10 projectile points, 1 polished celt, 1 polished and grooved ax, and 1 atlatl weight. She assured me that only artifacts discovered in the quarry were present. If this be true it is the only site in the survey to produce a grooved, polished ax and an atlatl weight.

AU-8 is 3.5 miles southwest of Waynesboro on the left (south) bank of South River (into South Fork of the Shenandoah). The river is crossed by State Highway 632, a few yards north of the site. Although the area is an extensive plain, only 4 or 5 acres were under cultivation near the river. A crude greenstone celt, 1 point, and 49 chips were collected. No pottery was found. The predominance of quartzite chips assigns the site to the preceramic "quartzite-using" period.

AU-9. W. H. Plumb of Waynesboro kindly pointed out this site. It is 5.4 miles southwest of Waynesboro and 0.2 mile southeast of a

Norfolk and Western Railroad trainstop called Lipscomb. State Highway 635 has been built through the eastern limit of the site. Other local features of advantage in locating it are South River (into South Fork of the Shenandoah) 0.4 mile to the east at nearest approach and an unnamed creek 200 yards to the northeast. At all visits the land was under cultivation by the Waynesboro Nurseries.

The site is on the slope of a ridge rising from the unnamed creek. The collection was made in an area 50 by 100 yards fronting on State Highway 635 and included 51 points and blades and 178 chips. It is a typical preceramic "quartzite-using" station. A series of 18- to 24-inch-deep pits dug by the Nurseries for removal of fruit trees revealed large percussion-made chips, but in no instance did an examination of the walls of the pits indicate any artifacts below 8 to 10 inches from the surface.

Unfortunately, Mr. Plumb, who had collected surface material from this site for 15 years, could separate no more than two artifacts in his extensive collection as having been found here.

AU-10 is located on a wide bottomland extending from the right (west) bank of Calfpasture River along with sites *AU-3* and *AU-4* (p. 16). The site is 25 yards from the river and 50 yards downstream from the mouth of Staples Run which enters the river from the opposite bank.

Five projectile points and blades and 48 chips constituted the total collection. No pottery was found. The site belongs to the preceramic "chert-using" period.

AU-11, from one direction, is 1.25 miles north of Waynesboro. At this distance from Waynesboro a bend to the east in South River (into the South Fork of the Shenandoah) brings the river, Norfolk and Western Railroad, and United States Highway 12 in close proximity to one another. From another direction, *AU-11* is 0.5 mile south of Dooms.

The western limit is 10 yards from the right (east) bank of South River. These 10 yards, at about water level, have been heavily eroded by the river, leaving a 2- to 6-foot-high terrace on which artifacts are found. The Norfolk and Western Railroad, running parallel to the river, cuts through the entire length of the site, a distance of 100 yards. The southern limit is an unnamed creek flowing into South River from the east. The site is 30 yards wide.

Three chip collections were made. Inspection indicated a concentration of chert in the middle of the site. Since this concentration was localized, it was believed that the other two collections, agreeing closely when broken down into percentage distribution of rock material, were representative of the site. In view of its uncertain significance, this chert collection was not included in the seriation studies. Materials

collected include 216 points and blades, 274 chips, 45 sherds, 4 drills, 16 celt fragments, and several miscellaneous artifacts.

AU-12, located 3 miles east of Dooms in Jarmen's Gap, is within the limits of the Shenandoah National Park. All material collected, 15 points and blades, 221 chips, and 1 sherd, was turned over to Guy Edwards, Park Superintendent, for the National Park Service.

AU-13 is 2.75 miles southeast of Waynesboro, on the left (north) bank of South River (into South Fork of the Shenandoah). The western limit of the site is formed by State Highway 664. The general area is a fertile bottomland 200 yards wide. The 10 yards nearest the river have been flood eroded and no artifacts were found here. Floods have created a 1½- to 4-foot-high terrace which parallels the bank for 100 yards. On this terrace and for 40 yards north of the river, occupational material is scattered. Conditions for surface collecting were ideal because the land was in corn cultivation at each visit. There were no concentrations of cultural objects.

Jerry Brownlee, a lad of 10 who lives on part of the site, had collected from it and allowed me to make use of his finds. These are reported in the statistical tables as a part of the accumulated totals consisting of 161 points and blades, 281 chips, 34 sherds, 3 scrapers, 1 drill, 5 celts, 9 steatite fragments, and 4 miscellaneous artifacts.

AU-14 will be found at Dooms, a small hamlet north of Waynesboro. More exact location is the field in the U-shaped bend in South River (into South Fork of Shenandoah) south of State Highway 611. At the base of the river's U bend is a low dam. On the right (east) bank near the dam most of the artifacts were found. However, they were scattered over the entire field, 40 by 75 yards in size. The land had been in wheat and was not well prepared for surface collecting.

The occupational complex was thinly scattered and difficult to find, but the area is well known to local collectors who state that many artifacts have been discovered. Fourteen points and blades, 134 chips, 1 ax fragment, and 3 celts were found, but no pottery. The majority of stone artifacts are quartzite and the site belongs to the preceramic "quartzite-using" period.

AU-15 is 0.75 mile north of Dooms on the right (east) bank of South River (into South Fork of Shenandoah). This preceramic "quartzite-using" station is 20 by 30 yards, on a 10-foot bank overlooking the river. Undoubtedly, some of the occupational area was not observed, for the northern end was in grass; the part available to inspection was in corn cultivation.

The artifacts were thinly scattered and predominantly made of quartzite. Owing to circumstances, a chip collection could not be made. The artifact sample is quite small: 16 points and blades and

1 end scraper. However, the site does add further evidence to the profusion of preceramic "quartzite-using" stations along streams in the South Rivers district.

AU-16 is north of the hamlet of Harriston, which, in turn, is 9.5 miles north of Waynesboro. From Harriston northward State Highway 825 is parallel to the right (east) bank of South River (into South Fork of Shenandoah) and is placed 15 yards from the river. East of the highway is a wide bottomland extending to United States Highway 12. For 35 yards east of the State Highway and 0.1 mile downstream from Harriston scattered artifacts may be found, all belonging to a preceramic "quartzite-using" complex. At the northern limit of this 0.1 mile there is a concentration, 30 by 50 yards in extent, of artifacts belonging to this same complex. The land was excellently prepared for surface collecting, for it had been planted with corn and the sandy soil had been washed with rain. Large percussion-made chips were relatively abundant. Only one potsherd was found. Cores were not a prominent feature. The collection consists of 54 points and blades, 144 chips, and 1 scraper.

AU-17, another preceramic "quartzite-using" station, is on the property of the Waynesboro Nurseries at Lipscomb (see *AU-9*), on the left (west) bank of South River (into South Fork of Shenandoah) with the eastern extent formed by State Highway 635. The southern limit is 25 yards from South River, along a primitive road leading from Highway 635 to a group of houses on the Norfolk and Western Railroad. The site covers an area 50 by 75 yards.

A second site, *AU-26*, is east of Highway 635 and should not be confused with *AU-17*. *AU-26* has a well-defined ceramic complex which *AU-17* does not have. Careful search under ideal surface-collecting conditions during a number of visits to both sites indicated there was no overlapping or intermingling of the two different complexes.

Occupational material was thinly scattered and large percussion-made quartzite chips were prominent, with 62 points and blades, 245 chips, 1 drill, and 1 scraper obtained for study.

AU-18 is a site originally found by Howard MacCord who contributed his material to this study. It is located on the right (east) bank of South River (into South Fork of Shenandoah) 0.3 mile west of Crimora, a tiny hamlet on United States Highway 12. The northern limit of the site is set by State Highway 612 as it crosses South River. The land was in sod whenever I visited the area and the extent of occupation could not be determined with accuracy; however, it is probably not more than half an acre. The land, almost level with the river, has been subject to much erosion, and MacCord found much of his material following a flood. The cultural complex falls in the preceramic "quartzite-using" horizon. Thirty-seven

points and blades, 3 axes, 6 celts, and 2 miscellaneous artifacts were available for analysis. In the overall pattern of this complex the presence of a chlorite pipe and 2 polished and 4 crude celts is not consistent. This combination of objects is generally found during the ceramic horizon. Although MacCord is a careful observer, he did not find any pottery.

AU-19 is on the property of Mrs. Gilpin Willson of Staunton. The site lies on a high terrace above the left (south) bank of Middle River 3.5 miles east of Fort Defiance. Mrs. Willson's small garden, on the edge of a broad grassy plain 15 feet above water level, was carefully searched without results, but she has found a modified steatite monitor pipe, a grooved ax, a polished celt, and a "hoe." It is possible more material will come to light when a larger section of the plain is cultivated.

AU-20, known as the Lewis Creek Mound, was built on a wide bottomland 10 yards from the right (south) bank of Lewis Creek and is 10 yards east of State Highway 792. At the present time, remains of the mound are 12 to 18 inches high and 42 feet in diameter. It is covered with sod except for several eroded places in which fragments of human bones are profuse. Dr. Betty J. Meggers, Dr. Clifford Evans, and I carried out a limited excavation in the remaining portion. The soil was black and hard packed. The portion above ground had been entirely disturbed by previous digging and many fragments of disarticulated skeletons were in evidence. Below the disturbed level a child's articulated, flexed skeleton was discovered, partially covered with rock slabs. No artifacts accompanied the burial. Several potsherds belonging to the Albemarle Series were found in the mound fill.

Destruction of the mound occurred about 30 years ago. As pieced together from stories of several individuals, the mound at one time was 6 feet high and about the diameter of the remains now (42 feet). One owner of the land carted off the top as a fill for part of his farm. Boys from Staunton discovered it and began to dig, one of whom, W. R. Brown, now associate professor of geology, University of Kentucky, Lexington, Ky., writes (personal communication, 1952):

Several layers of bones, I'd guess 3 or 4, were uncovered. Between each layer there must have been 8 to 12 inches of dirt. I could only make a wild guess as to how many individuals were represented, maybe 5 to 15 in different layers, possibly totalling 30 to 40 individuals. Of course I was impressed with the number of bones at the time and the number may have been considerably less.

It seems to me that about a dozen pipes were found. These were mostly of average size (3 by 5 inches) and ornamented. A lot of shell beads were found. Several Indians had chest ornaments (whatever they are called) made of thin tubes of bone (?). A fair number of black flint arrowheads were also found. The pipes as I remember them were made of dark, grey-green, well polished

soapstone. This could have come from numerous localities in the Piedmont, possibly from the belt extending from Albemarle County (Schuyler vicinity) southwestwards to Henry County or the Blue Ridge Plateau. My memory of these things is distinctly hazy. . . .

The final destruction of the mound was accomplished later by two pot hunters who sold and scattered the material so widely it has been impossible to trace it.

A small string of marginella beads, a few beads (?) made from the columella of conch, and several skulls are in the hands of a Reverend Mr. Glovier who lives a mile west of Lewis Creek Mound on State Highway 792.

AU-21 is on the right (east) bank of Middle River, 400 yards northeast of Fort Defiance Mill (also known as Damtown). The cultural remains are littered over an area 15 yards wide and 100 yards parallel to the river. If material had occurred in a 10-yard zone adjacent to the river, it has now been destroyed by floods and road building.

Howard MacCord discovered this site December 29, 1947, and such material as he collected was turned over to me for study: 26 points and blades, 90 sherds, 153 chips, 1 ax, 1 scraper, and 2 celts. Several visits to the site while under corn cultivation indicated an extremely scattered occupation.

AU-22 was also discovered by Howard MacCord who located it on the "left bank of Middle River east of United States Route 11" (MacCord, personal communication, 1951). An attempt was made to relocate the site without success. The material MacCord collected belonged to a preceramic "quartzite-using" complex. An area, entirely unsuitable for accumulating a satisfactory surface collection, was found with material similar to MacCord's, but whether this was MacCord's site is not known. The specimens consist of 6 points and blades, 1 scraper, and 1 pendant.

This site extends the areal distribution of preceramic "quartzite-using" stations slightly west of the South Rivers district concentration.

AU-23 is 1.1 miles east of Lofton on the left (southwest) bank of Pine Creek. This creek flows between low rounded hills and the occupational area is on a hillside 20 to 30 yards from Pine Creek. It covers an area 25 yards in diameter but undoubtedly is more extensive than this because artifacts were only found in the garden cultivated by Frank Seller. The remaining land had been planted in grass.

Howard MacCord discovered this site. His material was added to my collection. The entire artifact complex is a typical preceramic "quartzite-using" station: 86 points and blades, 149 chips, 1 scraper, 1 celt, and 1 steatite fragment. Quartzite cores and large percussion-

made chips were abundant. A single potsherd was found but no other evidence of a ceramic complex.

AU-24, another site near Lipscomb, is 1 mile west of the village on the left (north) bank of South River (into the South Fork of Shenandoah). The small river forms a large U bend with the base to the south. The land in the U is level but interrupted by relatively broad, staggered terrace formations. A concentration of artifacts is at the western extreme of the U; the northern and western side of the concentration is formed by a curved, primitive farm road. It is 50 yards in diameter and 20 yards removed from the nearest approach of South River. Scattered artifacts of the same complex were found peripherally to the east.

The site was originally discovered by MacCord, and his material acted as a guide to later collections. Specimens collected include 149 points and blades, 100 chips, 7 axes, 3 celts, 2 drills, and 1 pendant. A total of 12 sherds indicated a limited resettlement by a small group with the pottery-making tradition. However, after careful study of the cultural complexes in the survey area it was felt this site belongs overwhelmingly to a preceramic "quartzite-using" tradition. Quartzite cores were frequent and large percussion-made chips predominate.

AU-25 was discovered by MacCord and reported in his survey for the Virginia Conservation Commission with the statement: "Quartzite and flint chips, rejects, etc.,—no pottery" (MacCord, 1947-48). AU-25 is 2.8 miles southwest of Waynesboro on a 40-foot bluff overlooking the right (south) bank of South River (into South Fork of Shenandoah). The occupational complex is concentrated 200 yards west of the entrance of Back Creek into the river. The top of the bluff is a plateau covered with grass but heavily eroded. In the eroded patches quartzite chips and artifacts have been uncovered; the collection for analysis included 50 points and blades, 121 chips, 1 sherd, 1 ax, 2 scrapers, and 1 graver.

Since chert (flint) occurs in percentages of 1.6 percent (for chips) and 6 percent (for artifacts) at the site, MacCord's reference to "flint chips" and "rejects" was investigated thoroughly. It was found that in the angle between South River and Back Creek, on a wide bottomland, there is a concentration of chert. This area is peripheral to AU-25 and is not represented in the collection.

The complex is typical of a preceramic "quartzite-using" station. The single sherd was found on the fringe of the site.

AU-26, *Lipscomb* (Evans, 1955, p. 19), was originally discovered by MacCord in his survey for the Virginia Conservation Commission (MacCord, 1947-48). Dr. Clifford Evans has described the site and material he collected in the course of his limited excavation. He found a small quantity of sherds and 1 Small Triangular Type A and

3 Triangular Type C projectile points. These have been included with my collection. Since the sherd collection was small, I revisited the site and extended his excavation to collect more material. A total of 149 sherds, 3 fragments of soapstone, 219 chips, and 16 projectile points was accumulated.

AU-26 is 50 yards east of *AU-17* (vide supra) at Lipscomb on the left (west) bank of South River (into South Fork of Shenandoah). Evans (1955, p. 20) describes the site as follows:

On the left bank of South River, opposite the community of Lipscomb, there is a high point of land rising 9 feet above the water level where Virginia Highway No. 635 crosses a small bridge over the river. The small habitation site was clearly visible as the highest spot along this part of the bank. Sherds were extremely sparse, but chips and points were scattered over an area 30 yards in diameter. Since the land was in permanent pasture, collecting was difficult; but sand pits permitted lateral troweling, which produced a fair quantity of archeological specimens. There is no question that the area was a site of only limited occupation. The artifacts were in a layer of light-gray soil extending from the surface downward for 6 inches. The bright-yellow sterile sand beneath yielded no cultural refuse.

AU-27, a rock shelter high above the left (north) bank of North River, is 0.1 mile northwest of Camp May Flather, a Girl Scout summer camp. The shelter is between a well-traveled, hard-surfaced road leading from Mount Solon to the Staunton Reservoir and an abandoned dirt road, both of which parallel the river.

The shelter, 8 feet wide, 6 feet deep, and 3 feet high, is formed in quartzite strata. Large and small natural spallings litter the level floor. On the surface a crude ax was found and excavation produced 1 point fragment, 81 chert chips, 1 chert core, 2 white quartz chips, 8 sherds, and 3 small unidentifiable fragments of animal bones.

AU-28 is a second shelter 15 yards southeast of *AU-27*. The roof is formed by a thick slab of quartzite on the upper surface of which is a circular depression. This depression is locally famous as the mortar in which Indians ground their corn. The shelter, 10 yards in length, 3 to 4 feet high, and 8 feet deep, has been partially blocked by a recent cave-in. The eastern half is clear and at the entrance 3 Stony Creek Series sherds and a few chert chips were found on the surface. Remains of a recent fire, probably made by deer hunters, littered the center of the floor.

Both shelters, *AU-27* and *AU-28*, were discovered by Roy Roby of Staunton.

AU-29. Collections from this site were made by Charles Ramsey and Dr. Charles Callar. They collected independently, and neither knew of the other's collection. It is of interest to note the similarity between the two collections (see table 1).

TABLE 1.—*Comparison of two separate collections from AU-29 to show consistency of artifact types in random samples*

Projectile-point type	Chert		Quartz		Quartzite		Total	
	Ramsey	Callar	Ramsey	Callar	Ramsey	Callar	Ramsey	Callar
Triangular Type C.....	0	1	0	0	0	0	0	1
Stubby Barbed Type H.....	0	2	0	0	0	0	0	2
Notched Stemmed Type I...	4	4	1	1	0	0	5	5
Ovoid Base Type J.....	1	1	0	1	0	1	1	3
Contracting Stemmed Type K.....	2	0	0	0	1	1	3	1
Parallel-sided Stemmed Type L.....	11	7	0	1	3	5	14	13
Side-notched Type M.....	6	0	0	0	2	0	8	0
Unclassified Type N.....	2	4	1	0	3	3	6	7
Eared Type O.....	0	1	0	0	0	0	0	1
Large Parallel-sided Stemmed Type Q.....	0	0	0	0	6	5	6	5
Large blades, unclassified Type V.....	0	0	0	0	0	2	0	2
Total.....							43	40

Greatest relative disagreement is in Side-notched Type M, which may be accounted for by the limited samples.

This site is on level land at the foot of Seidling Hill 150 yards from the right (north) bank of Calfpasture River. It is about equidistant (10 miles) from Deerfield and Goshen, on the opposite side of the river from a rugged valley known as Ramsey's Gap. On my visit I found the site completely covered by grass; hence it was impossible to determine the extent of the site, and a wide search was unrewarding except for a few chert chips.

AU-30. "Natural Chimneys," tall columns of limestone perforated at the bases by caves and tunnels, are located 1 mile north of Mount Solon, 150 to 200 yards east of the right bank of North River. In the process of excavating the tunnels to lay walks and steps, a series of artifacts were found and are on exhibit at the information office.

Among the preserved specimens are rodent-gnawed deer bones, a fragment of a "paint pot," a shell gorget 2½ inches in diameter with a center-drilled hole, an animal incisor tooth perforated for suspension, 1 fragmentary and 1 complete conch columella "bead," deer teeth, and several unclassified bones. In addition to the 22 points and blades analyzed, there are a polished celt and a crude ax; however this small sample tends to give an unreliable picture of the artifact complex.

The owner kindly allowed inspection of the tunnels and caves, but nothing was found but a small fragment of bone.

The cultural complex to which the stone artifacts belong is that designated as preceramic "chert-using."

AU-31 is located 1.25 miles southeast of Laurel Hill. It lies on the summit of an 80-foot cliff overlooking the broad, grassy plain of Middle River and Lewis Creek; the confluence of these streams is 0.2 mile to the west. Occupational refuse is concentrated from the very edge of the 25-yard bluff eastward to State Highway 612, a distance of 50 yards. At each visit the red-brown clay soil was in corn cultivation, and collecting conditions were ideal.

Occupational refuse was more localized and profuse at this site than any other encountered. There were areas 3 to 5 yards in diameter, in which village refuse was relatively concentrated. Here chips, artifacts of stone and clay, and fire-cracked rocks were observed. However, no charcoal stains were seen. An unusual feature is the prominence of polished celts. The collection included 96 point and blade fragments, 343 sherds, 117 chips, 5 drills, 1 scraper, 4 crude and 16 polished celts, and 1 stone pipe.

AU-32, located 1.1 miles southwest of Stuart's Draft, is 250 to 300 yards from the right (south) bank of South River (into South Fork of Shenandoah). A few yards west of the site flows a small stream known as John's Run. The general terrain is a broad bottomland, but 20 yards north of the site the land rises gradually until 4 or 5 feet above the river plain. Elevation of the land continues southward to form an irregular ridge. A low moundlike formation northwest of the site was excavated by MacCord who reported it to be a natural feature.

The light-tan, sandy soil was in wheat cultivation at each visit. Artifacts were extremely thinly scattered and no concentration was found. Only 10 points and blades, 1 sherd, 1 celt, and 98 chips were collected. However, the percentage breakdown of the chips indicates that the site belongs to a preceramic "quartzite-using" complex; the 1 potsherd and 1 polished celt are clues to possible resettlement by a group with pottery-making tradition.

AU-33 is 0.75 mile south of Stuart's Draft at the intersection of State Highways 610 and 608. The site lies on the northern slope of a 40-foot-high ridge, 150 yards from the right (south) bank of South River (into South Fork of Shenandoah). Occupational refuse is found on both sides of Highway 608, but more profusely to the west. The site undoubtedly extends south of Highway 610, but a house with a small lawn precludes surface hunting. The observable size is approximately 40 yards in diameter.

The sandy clay soil was in wheat but had been rain washed, and reasonably good surface-collecting conditions existed. Although three scattered potsherds were found, the stone refuse overwhelmingly

belongs to a preceramic "quartzite-using" complex. The collection consists of 48 points and blades, 218 chips, 5 scrapers, 1 drill, 1 ax, and 1 hammer-anvil stone.

AU-34 is 0.3 mile south of Stuart's Draft, partially on the slope and partially on the plateau of a terrace 150 yards from the left (north) bank of South River (into South Fork of Shenandoah). The position of the site is similar to *AU-33* on the opposite bank, south of *AU-34*. Large farms are under cultivation on the plateau of this terrace east and west of State Highway 608. Examination of a mile along the terrace indicated a scattered occupation by a preceramic "quartzite-using" culture. The only point of concentration of artifacts occurred 200 yards east of Highway 608. Here 3 points and blades and 2 scrapers were found. An insufficient quantity of chips precluded an analysis of these but they were predominantly quartzite.

AU-35 is a complex of three sites on the left (west) bank of Middle River 4.0 miles northwest of Staunton. The general area is a broad, grassy bottomland more than 2 miles in length. U. S. Highway 250 crosses Middle River 0.25 mile north of *AU-35-M*.

AU-35-M, a mound mentioned by Fowke (1894, p. 37) is known locally as the "East Mound," being on the property of John East, of Churchville. It lies 30 yards west of Middle River, and is one of the larger mounds still standing in Virginia, 55 feet wide, 45 feet long, and 2 feet high above the natural plain. The site was tested with three cuts (Holland, Evans, and Meggers, 1953). Burials were placed in a flexed position under an irregular layer of rocks. One burial was accompanied by a chlorite pipe and another by a pendant, a fragment of copper, and 3 Triangular Type C points (*ibid.*, figs. 7, 8). A total of 35 potsherds were troweled from the black fill; 25 were Albemarle Series and 10 Radford Series sherds. The mound had obviously been built on an older village site, represented by the occupational refuse of *AU-35-V-1*.

AU-35-V-1 extends from the mound 100 yards south, parallel to Middle River. Undoubtedly it extends north of the mound but this could not be confirmed owing to coverage with pasture. Most of the gray-tan, sandy soil south of the mound was cultivated, and artifacts were thinly scattered from the riverbank over the bottomland, 50 yards to the west. It required several visits to build up a sherd collection. The limestone-tempered (Radford Series) sherds were leached, leaving small angular holes. Artifacts for analysis included 129 sherds, 172 chips, 44 points and blades, 2 drills, and 1 celt.

AU-35-V-2 is located 400 yards south of *AU-35-V-1*. An area 25 yards in diameter, 10 yards from the river, on a low terrace, contained occupational debris. The character of the complex was very similar to *AU-35-V-1*, but it was felt that seriating the material from

the two sites separately might show time differences. (See figs. 5 and 8, and p. 61). Thirty-nine points and blades, 62 sherds, and 132 chips were collected for analysis.

AU-36 is 16.5 miles northwest of Staunton in the small community of Lebanon. For more precise local reference, it is in the northwest angle formed by the intersection of U. S. Highway 250 and State Highway 272. The western limit of the site is 10 to 15 yards from Broad Draft and the southern limit is 150 yards from the right (north) bank of Calfpasture River. The cultivated field containing occupational refuse is 1.0 to 1.5 feet higher than Broad Draft and 3 to 4 feet higher than the bottomland adjacent to Calfpasture River. The site is 10 to 15 yards wide in an east-west direction and 25 to 30 yards long in a north-south direction.

No pottery was found after careful search, but 110 points and blades, 168 chips, and 3 scrapers were collected, with the site representing a preceramic "chert-using" station.

AU-37 is a small site in Deerfield Valley, 200 yards north of the right bank of Calfpasture River and 10 yards west of Halloway Draft. Tisdale Branch is 50 yards west of the site. The land, which slopes gently and evenly to Calfpasture River, was under corn cultivation by the Polka-Dot Farms, owners of the land.

The occupational refuse consisted of 6 points and blades and 36 chips, mostly chert. This quantity of material represents a very limited occupation. Since no pottery was found, the site was occupied undoubtedly by a group with a preceramic "chert-using" complex.

AU-38, located 1.1 miles east of Lofton, lies on a ridge north of *AU-23*, 25 yards from the right (north) bank of Pine Creek. The site, covering 20 by 40 yards on the summit of the ridge, is 25 feet higher than Pine Creek. The yellow sandy loam was planted with corn and had been washed by rain, making conditions for surface collecting excellent. No trace of pottery was found. The material was thinly scattered and large percussion-made chips of quartzite were in the majority; the collection included 48 points and blades, 132 chips, and 1 drill. A family named Langhorne owns the land and has made a limited collection. Three artifacts, definitely known to have been found on the site, were incorporated in the analysis.

The cultural complex indicates a preceramic "quartzite-using" station. The material is similar in all respects to that found at *AU-23*.

AU-39. Howard MacCord informed me he had found large percussion-made quartzite chips and a few artifacts 1.75 miles south of Lofton in front of Mount Joy church. The land was not cultivated but overgrown with weeds and grass. A single brief visit located 2 unclassified quartzite blades and 43 quartzite chips, the majority of which were large and made by percussion. This meager evidence

points to a continuous geographical occupation in the South Rivers district by groups having a preceramic "quartzite-using" complex.

AU-40. The boundary between Augusta and Rockbridge Counties crosses this site 1 mile northeast of Vesuvius and 1.5 miles southeast of Steeles Tavern. It lies on a gentle slope from Groah's Ridge 0.2 mile from the left (southeast) bank of South River (into James). The western limit, a steep bank, is crowned by the Norfolk and Western Railroad and a primitive dirt road. It is 100 by 35 yards in size.

The slope is a tan, sandy-clay soil permeated with rounded river pebbles. The occupational refuse contained no pottery, but large angular cores of quartzite were frequent and large percussion-made chips were prominent. The collection includes 76 points and blades, 126 chips, 2 axes, 2 scrapers, 1 celt, and 1 graver. The cultural complex is typically preceramic "quartzite-using."

AU-41 is on the left (northeast) bank of McKittrick Creek, a tributary to Middle River through Jennings's Branch, 1.5 miles west of Lone Fountain. State Highway 720 crosses McKittrick Creek at the eastern edge of the site. A deeply rutted plain from overflow of the creek lies to the northeast. The soil is sandy and was planted with wheat during several visits. Artifacts, found on the low, level, cultivated land, were thinly scattered over an area 20 yards in diameter. Undoubtedly much of the site has been eroded away by floods. The material collected for analysis includes 51 points and blades, 99 chips, and 4 scrapers. This cultural complex belongs to that of a preceramic "chert-using" station. Four potsherds indicate a very limited resettlement by a small group with a ceramic complex.

AU-42, 0.5 mile northeast of the intersection of State Highway 272 and U. S. Highway 250 where *AU-36* is found, lies on a wide bottomland 50 yards from the right (west) bank of Calfpasture River. Northwest of the site are ridges from the Pinnacle of Bald Knob. The east-west length is 100 yards and the width does not exceed 10 yards.

The occupational material is so thinly scattered that very close observation of the plowed, sandy field was necessary to find it. The collection consists of 20 points and blades, 120 chips, and 4 sherds. The stone artifact complex falls predominantly into a preceramic "chert-using" period; the 4 potsherds suggest a possible resettlement by a group with a pottery tradition.

AU-43, 0.5 mile northeast of Verona, where U. S. Highway 11 crosses Middle River, is 100 yards west of the bridge and 20 yards from the right (south) bank of the river. It is 10 by 20 yards in extent and lies on a 4- to 5-foot terrace formed by erosion of a small unnamed creek and Middle River. The tan, sandy-clay soil was in corn cultivation. The collection consists of 63 points and blades, 211 chips, 6 sherds, and 2 miscellaneous items.

A preceramic "chert-using" complex is mainly represented by the refuse, but the 6 potsherds and 1 Small Triangular Type A point indicate a possible later resettlement, which was probably brief.

AU-44, on the same side of Middle River as *AU-43*, is 400 yards east of U. S. Highway 11 bridge and 0.5 mile northeast of Verona. The general area is an extensive bottomland of sandy soil, usually under wheat cultivation. Occupational refuse was littered for 50 yards along Middle River and 20 yards inland. It was discovered after a flood had eroded two channels, 3 to 4 feet deep and 30 yards inland. On the gray clay hardpan base of the channels and in the sandy soil of the channel banks a relatively large sample of pottery and chert chips was collected; stone artifacts, other than chips, were scarce.

It was evident that material in the base of the channels had been washed from a more superficial zone. To test this observation a pit 2 feet square and 2 feet deep was dug 25 yards west of the channels and 5 yards from the river. All dirt was sifted through a quarter-inch-mesh screen. Potsherds were encountered in the upper 8 inches but none below this level. The ceramic assemblage was better preserved and in larger fragments than from any other site. The total collection for study consisted of 15 points and blades, 111 chips, 1 pendant, 1 crude limestone ax, and 260 potsherds.

AU-45 was discovered by Roy Roby of Staunton, 4.75 miles north of Staunton on the left (west) bank of Middle River. A closer point of reference is Shutterly's (Frank's) Mill, 1 mile to the southwest (see *AU-5*). On the opposite side of Middle River is an ancient stone house served by a ford from State Highway 732.

The site is situated on an extensive sandy bottomland, 10 yards from the river and 6 to 8 feet above water level. The approximate middle of the site is marked by a low knoll containing cracked bricks and molten glass from a burned house. The width of the site is 10 to 20 yards and it is 100 yards long.

Occupational refuse, somewhat concentrated near the knoll, is thinly scattered, and close examination of the cultivated field was necessary. The pottery sample of 141 sherds is composed mainly of small, eroded fragments. One of the better assemblages of chipped-stone artifacts in the ceramic horizon came from this site, represented by 132 points and blades, 128 chips, 4 drills, 1 scraper, 2 celts, 2 hammer-anvil stones, and 1 pendant.

AU-46 is on a 35-foot bluff overlooking the left (northwest) bank of Middle River, 1 mile northeast of *AU-45* (vide supra); State Highway 732 is 50 yards northwest of the site. The bluff is the river end of an irregular ridge.

The hard reddish clay soil was mostly in grass, but a small segment on top of the bluff was in wheat cultivation. Occupational refuse

came from a 10 by 20-yard area, partly in the cultivated zone and partly in eroded spots along the bluff. Only 11 sherds and 22 chipped stone artifacts, 2 hammer-anvil stones, and 132 chips were recovered.

AU-47 occupies a narrow, cultivated bottomland opposite *AU-46*. Observation of the sandy flat shows it has been subject to much erosion by floods. One area, 10 by 15 yards in extent, at the base of a low ridge, is one foot higher than the surrounding zone. On this elevated spot, 2 points, 2 drills, 2 hammerstones and 32 chips, mostly chert, were recovered.

AU-48 is on the southwest slope of Bell's Creek Valley, 3.5 miles northwest of Staunton with U. S. Highway 250 forming the northeastern boundary. On a narrow terrace, 40 to 60 feet above and 0.1 mile southwest of Bell's Creek, occupied by houses and lawns, occupational debris was found. It was concentrated in an area 10 yards in diameter which was in the process of being planted with grass. The reddish-tan soil disturbed by plowing was, at no time, satisfactory for surface collecting. In spite of this, an assemblage of 17 chipped-stone artifacts and 210 chips was recovered. The distribution of chipped-stone artifacts and the presence of a high percentage of chert chips, in the absence of pottery, indicate the site was occupied by a group with a preceramic "chert-using" complex.

AU-49 was discovered in August 1952, the final survey month, with the result that the collection is very limited. It has the possibility of being a productive site. *AU-49* is 0.8 mile northwest of Laurel Hill on the right (south) bank of Middle River. Middle River forms a wide U with the base of the U to the west. The low, sandy bottomland had been newly plowed and collecting conditions were not satisfactory. The occupational area extends 25 yards along the bank and 75 yards to the south (inland). A few potsherds, 32 chert and 14 quartz chips, and 1 quartzite chip were the total finds at this first inspection.

BATH COUNTY

BA-1 is a small cave or rock shelter 1 mile northwest of Millboro Springs and a quarter of a mile northwest of Windy Cove Church, on the left (northeast) bank of Cowpasture River. The cave, fronting on U. S. Highway 39, has three sections, of which only the eastern was investigated. This section, 8 feet 3 inches wide, 5 to 6 feet high, and 18 feet long, slopes gradually upward to meet a larger cave higher in the cliff. Across the entrance a trench 5 feet long, 2 feet deep, and 1.5 feet wide had been dug before we arrived and the dirt sifted through a screen. It was decided to extend this excavation from wall to wall and increase the depth to hardpan. This was done and the posterior wall freshened to see if stratification existed. It was found that the upper 10 inches was yellow clay resting on a

charcoal layer 2 inches thick. Below this was 7 inches of dark-gray sandy soil. The lowest 21 inches was gray-black soil resting on the hardpan.

The cave was excavated in 8-inch levels, passing all the dirt through a quarter-inch-mesh screen. During the excavation an oval pit 28 inches deep, 3 feet wide, and 4 feet long was discovered. The material, analyzed by levels, was homogenous from top to bottom. All the pottery (57 sherds) was of the Radford Series. All rock material was natural spallings from chert inclusions in the cave, except two chipped-stone artifacts. A single kernel of charred corn and two walnut hulls came from the lowest level of the pit. There was also one antler projectile point.

The analysis of the animal and bird bones and shells by the United States National Museum follows:

Animals (identified by Henry W. Setzer):

Beaver (<i>Castor canadensis</i>)	Woodrat (<i>Neotoma</i> sp.)
2 teeth	1 humerus
1 atlas	1 tibio-fibula
Deer (<i>Odocoileus virginianus</i>)	Rabbit (<i>Sylvilagus floridanus</i>)
2 teeth	1 innominate
2 ulnae	1 scapula
1 toe bone	1 ulna
1 patella	1 vertebra
Marmot (<i>Marmota monax</i>)	Carnivora
1 mandible	2 canine teeth
1 tooth	310 unidentifiable fragments which would probably be referable to deer for the most part
Gray squirrel (<i>Sciurus californensis</i>)	
2 mandibles	
1 tibia	
1 innominate	
1 femur	
1 calcaneum	
1 vertebra	

Birds (identified by Herbert W. Friedmann):

Wild turkey (<i>Meleagris gallopavo</i>)
2 vertebrae
1 fragmentary carpometacarpal
1 fragment of a tibiotarsus
1 fragment of a tarsometatarsus
18 unidentifiable fragments, possibly pieces of turkey skull

Shells (identified by Joseph P. E. Morrison):

<i>Elliptio complanatus</i> (Slonader)
<i>Mudalia carinata</i> (Bruguiere)
<i>Triodopsis albolarbris</i> (Say)
<i>Triodopsis tridentata juxtidentis</i> (Pilsbry)
<i>Mesodon thyroidus</i> (Say)
<i>Anguispira alternata</i> (Say)
<i>Ventridens ligera</i> (Say)
<i>Haplotrema concavum</i> (Say)

HIGHLAND COUNTY

HD-1 is a small rock shelter in a limestone cliff on the right bank of Straight Creek, 6 miles northeast of Monterey. The level floor, composed of brownish leaf mold and dirt, is 7 feet above water level impounded behind a sediment-filled, mossy dam. Excavation revealed no cultural objects although numerous animal bones, principally rodent and deer, were taken from the upper 6 to 10 inches. Natural chert spallings were frequent; no positively identifiable man-made chips could be found.

It can be argued that the bones are the results of white man's activities; however, the profusion, types, preservation, and depth of the deposit are indications of aboriginal origin. It is unfortunate that no means of assigning this assemblage of bones to a time period was discovered.

HD-2 is 2 miles northeast of Mustoe and 6 miles south of Monterey, near the headwaters of Dry Branch, a tributary to Jackson River. It lies on a level, plateaulike ridge extending from Sounding Knob, 40 feet above and 40 yards from the right (west) bank of Dry Branch. Mrs. Ralph Trimble, Chapel Hill, N. C., owner of the land, had the entire section in sod for grazing purposes. It was visited through the courtesy of her brother, Frank Terry, Monterey, who stated that the site had been dug into many times and that pottery and deer antlers had been removed from it.

The site, 12 to 18 inches high and 18 feet in diameter, rests on the southeastern side of the plateau, and was covered with sod. Three test trenches demonstrated that the black soil, filled with hundreds of small shells, did not extend more than 6 to 10 inches below the sod, and owing to previous digging, had no undisturbed stratification. The black fill was permeated with fire-cracked stones, charcoal, pottery, shells, animal bones, chips, and projectile points, with the collection including 8 points, 86 chips, 5 miscellaneous objects, and 88 sherds. No human bones were in evidence. The character of the structure was that of a midden.

A list of mammal and bird bones and shells identified by the United States National Museum follows:

Animals (identified by Henry W. Setzer):

Deer (*Odocoileus virginianus*)

4 vertebra	1 exoccipital
2 humeri (distal ends)	4 toe bones
1 humerus (proximal end)	5 metapodials
1 scapula	1 ulna (proximal end)
1 innominate	1 patella
1 femur (distal end)	2 os petrosi
1 femur (proximal end)	1 tooth
2 calcanea	

Rabbit (<i>Sylvilagus</i> sp.)	80 unidentifiable fragments of
1 mandible	which the majority would
	probably be referable to deer
Marmot (<i>Marmota monax</i>)	
1 femur	
1 tibia	
Chipmunk (<i>Tamias striatus</i>)	
1 mandible	
1 humerus	
1 tibia	
Gray fox (<i>Urocyon cinereoargenteus</i>)	
1 mandible	
Birds (identified by Herbert W. Friedmann):	
<i>Melagris gallopavo</i> (wild turkey)	
1 fragment of a sternum	
Shells (identified by Joseph P. E. Morrison):	
<i>Elliptio complanatus</i> (Solander)	
<i>Mudalia carinata</i> (Brugiere)	
<i>Mesodon sayanus</i> (Pilsbry)	
<i>Triodopsis fraudulenta</i> (Pilsbry)	
<i>Mesomphix cupeus</i> (Rafinesque)	
<i>Triodopsis tridentata juxtidentis</i> (Pilsbry)	
<i>Heliodiscus parallelus</i> (Say)	

Mr. Terry stated there were three such structures on the plateau, but only one was located. Along the western embankment of the ridge, black soil, chert chips, several triangular points, and sherds of pottery were found on the surface. It could not be determined whether this had been thrown here in destruction of the midden or was part of a second midden.

HD-3 is on the right (west) bank of Dry Branch in the valley below HD-2. Along the base of the ridge, 10 yards from and parallel to Dry Branch, are an abandoned, primitive road and shallow gullies formed by erosive floods from Dry Branch. From these ground features came an artifact assemblage of an entirely different complex from that of Site HD-2 on the plateau. There were no potsherds, cracked stones, charcoal stains, or bones. Among the 16 chipped-stone artifacts, not one was triangular, the only type found on the plateau. For study, 105 chips were collected. It is believed that this site represents a preceramic horizon, belonging to the "chert-using" cultural complex.

HD-4, at the intersection of the Burnsville-Williamsville-McDowell roads, 10 miles southwest of McDowell, is on a 10-foot terrace 200 yards from the right (west) bank of Bullpasture River. At the base of the terrace bank runs the Williamsville-McDowell road, and 20 yards northwest of the area with occupational refuse are abandoned farm and outbuildings. An acre of the gray, sand-clay loam was in corn cultivation while the remainder was in sod.

The 101 chipped-stone artifacts and 186 chips, predominantly blue chert, have a trait complex similar to that found in Augusta County on preceramic "chert-using" stations. Only two potsherds indicate a possible very limited resettlement by a group with a ceramic complex. In addition, eight scrapers came from the site.

HD-5 is located on a plain south of the Burnsville Highway and 200 yards northwest of *HD-4*. An unnamed creek, close to and parallel with the Burnsville Highway, flows eastward into Bullpasture River. It lies 10 yards north of the site. Occupational refuse was found in a newly cultivated patch an acre in extent. The artifacts were thinly scattered and scarce: 4 points, 39 chert, and 2 quartzite chips. There was no evidence of pottery.

This small assemblage is believed to show a limited occupation by a preceramic "chert-using" group whose cultural complex is similar to *HD-4*.

HD-6 is in the very small community of Headwaters, 0.25 mile from the left (east) bank of Shaw's Fork, a tributary to Cowpasture River. A Protestant church and U. S. Highway 250 form the northern limit. The entire region slopes to Shaw's Fork from Shenandoah Mountain. At the western edge there is a sharp, 4-foot embankment parallel to Shaw's Fork.

Only 11 points, 1 scraper, and 116 chips were recovered. The heavily rock-strewn clay soil contained the remains of the previous year's corn-crop stubble and weeds and had been generously washed by rains, making collecting and observation conditions excellent. No pottery was encountered. The material belongs to a preceramic "chert-using" complex.

HD-7, within the town limits of McDowell, is on the right (west) bank of Bullpasture River. At the northern limit is the intersection of U. S. Highway 250 and State Highway 269. In close proximity, to the west, is a school and play yard. The eastern limit is a 2- to 3-foot sloping bank of the low terrace on which occupational debris is scattered 20 yards from the river. The area covered by refuse is 10 to 20 yards in diameter.

The rock-strewn, sandy soil was planted in corn. No pottery was discovered. The cultural traits, defined by the 34 chipped-stone artifacts and 126 chips, place the site among the preceramic "chert-using" stations.

HD-8 extends from the left (east) bank of Bullpasture River over a narrow belt of plain. The riverbank, 8 feet high, is strewn with chert chips and an occasional artifact. The home of Emery Lockridge, his lawn, and farm cover the occupational area which is situated directly east of the intersection of the Burnsville-Williamsville-McDowell roads.

Unfortunately, at the time of the survey no collections were made; however, it is potentially a productive site, worthy of future exploration.

HD-9, Clover Creek Mound, was excavated and described by Fowke (1894, pp. 31-32), but he was not the only one to dig here. C. H. Graham, aged 85, who lives within a mile of the mound, informed me he made an excavation in the mound and recovered "bushels of pottery and bones" for George Revercomb who owned the property at the time of Fowke's visit. The land is now owned by Mrs. Bessie Bradshaw.

The mound at present is 18 to 24 inches high, 35 and 50 feet in width and length, covered with grass. Two small test pits, dug to a depth of 18 inches, produced scraps of leached, limestone-tempered Radford Series pottery and fine fragments of charcoal.

In response to a request, Evans analyzed the pottery in the collections of the United States National Museum from Fowke's excavations, and reports (personal communication, 1952): "There are 156 sherds of Radford Cordmarked and 1 sherd of Radford Series Plain, representing, at most, 15 vessels."

ROCKINGHAM COUNTY

RM-1, located on the left (west) bank of the South Fork of the Shenandoah River, is 0.1 mile east of the mouth of South River. Other local points of reference are Port Republic and the State Highway 865 bridge 0.2 mile to the west. Here, a wide sandy plain, 10 to 15 feet above the river, extends to the northwest. Artifacts were recovered for 100 yards along the riverbank and 35 yards inland. The present owner, a Mr. Alexander, estimates 5,000 stone specimens have been found in the past, but this is undoubtedly an overestimate.

The land, under wheat and corn cultivation, presented good surface-collecting conditions. The entire stone assemblage of 72 points and blades, except for 1 Medium Triangular Type B chert point, was the result of occupation by a group with a preceramic "quartzite-using" complex. Three axes, 2 scrapers, 1 chloritic schist pipe, and 1 pendant also came from the site.

RM-1A is an area of *RM-1* where a different assemblage of artifacts was found. It is by the riverbank on an eroded slope covering an area 10 yards in diameter. This chip collection of 224 specimens has a predominance of chert as compared with the low percentage of this material on the preceramic site. Without any doubt this area represents another occupation of the region, quite independent of *RM-1*.

RM-2 is 0.5 mile west of *RM-1* on the north bank of combined North and Middle Rivers. A steep ridge with an abandoned stone quarry at its base separates the long grassy plain, along the bank of

which artifacts were found, from State Highway 865 bridge, which crosses the combined rivers 0.3 mile to the east. The occupational refuse was found 30 yards from the river, the intervening slope being deeply channeled by overflow from the river. The crest of the plain is fully 15 feet above present water level. The bank from which artifacts had been eroded is composed of red-brown clay, 20 to 30 yards in east-west length.

The scarce material, 10 chipped stone specimens and 120 chips, predominantly quartzite, reflects an occupation similar to RM-1, that is, a preceramic "quartzite-using" station.

RM-3, Madison Run Rock Shelter (Holland, 1953), is within the Shenandoah National Park boundaries 2.5 miles east of Grottoes. Ten feet wide, 5 feet deep, and 3.5 to 4 feet high, it is formed in strata of quartzite and faces on Madison Run. This shelter was excavated under the supervision of J. C. Harrington, archeologist for Region Number 1 of the National Park Service. The reader is referred to the published report for complete details, but the findings, in brief, were limited to the upper 6 inches of the relatively level floor and belonged to a preceramic horizon. The collection included 31 points and blades. One sherd of pottery was also found, apparently of a later occupation.

RM-4 is a complex of sites discovered 1.2 miles northeast of Port Republic on the left (northwest) bank of the South Fork of the Shenandoah River. The first area encountered was opposite the western end of a large unnamed island in the river. This area has been designated RM-4.

RM-4 extends 100 yards downstream from an abandoned house and farm road leading to the river. A narrow plain lies between an 8-foot bank at the river edge and a low ridge parallel to the river to the northwest. Refuse was confined to a 20-yard belt along the bank. There were places, 10 yards in diameter, in which fire-cracked stones and artifacts appeared to be concentrated. The collection of materials for analysis consisted of 99 points and blades, 140 chips, 12 celts, 1 drill, 2 miscellaneous objects, and 350 sherds.

RM-4A lies on a narrow plain 25 yards southwest of RM-4. The intervening land was obscured by high weeds and undergrowth. Careful examination of the two sites disclosed an extension of RM-4, having a ceramic complex, to RM-4A, a preceramic "quartzite-using" station. Some 20 sherds of pottery were found in the overlapping zone as well as a small sample of triangular projectile points. Use of chip collections to separate a ceramic complex from a preceramic complex is well illustrated on RM-4A. Three collections, one from the overlapping zone, one in the middle of RM-4A, and one at

the extreme southwestern end^m of the site were gathered. These have been shown in table 2 with the collection from RM-4 at the top.

TABLE 2.—*Rock type analysis of chip collections from the complex of sites around RM-4*

	Chert		Quartz		Quartzite		Greenstone		Total	
	Num- ber	Per- cent	Num- ber	Per- cent	Num- ber	Per- cent	Num- ber	Per- cent	Num- ber	Per- cent
RM-4.....	112	80	21	15	6	4.3	1	0.7	140	100
Overlapped zone....	73	50	13	8.8	59	40	2	1.2	147	100
Middle RM-4A....	54	35.8	15	9.9	80	53	2	1.3	151	100
Distant zone of RM-4A.....	18	14.5	21	17	85	68.5	0	0.0	124	100

There is a progressive loss of chert and a proportional gain in quartzite with increasing distance from RM-4. It is believed that the resettlement of the preceramic site by a group possessing a ceramic complex distorted the patterns of both to such a degree that the point and blade collection of RM-4A could not be used in the seriation and was, therefore, thrown out of this part of the study even though it had an assemblage of 240 points and blades and 17 other artifacts. Although originally it was thought that the point and blade collection of RM-4 had been unmixed and represented one cultural complex, efforts to seriate it in the various sequences proved otherwise. For this reason the collection of stone artifacts could not be used. However, the pottery sample does represent one group and is used even though it is impossible to separate the proper points and blades from the collections of RM-4 and RM-4A.

RM-4B presented an entirely different situation from RM-4 or RM-4A. This site lies on a 6- to 8-foot terrace northwest of RM-4A and is separated from it by a sterile, shallow, dry channel 15 yards wide and 35 yards from the river. The complex, recovered from 50 by 30 yards of sandy clay soil in corn cultivation, had only traits assignable to a preceramic "quartzite-using" station. This collection included 88 points and blades, and two chip collections totaling 286 specimens.

RM-5, *RM-6*, and *RM-8* are a series of sites in close proximity having a similar preceramic "quartzite-using" pattern. They are located 1.5 to 1.75 miles south of the highway bridge at Island Fork across the South Fork of the Shenandoah, on the right (east) bank. State Highway 642 has been built atop the 15- to 20-foot riverbank and acts as the western limit of the sites. To the east is a sandy clay plain over a mile wide.

RM-5 is on the property of a Mr. Harrison and is the most northern of the three sites. Cultural debris is very thinly scattered and only 13 points and blades, 78 chips, a crude ax, and 1 graver were found.

The cultural traits shown by these artifacts plus the chip collection place the site in the preceramic "quartzite-using" complex.

RM-6 is 0.25 mile south of *RM-5* on the property of a Mr. Sipe, who states that a rock mound stood within a few yards of his home but was carted away in the late 1800's. The only specimen preserved after the destruction of the mound is a right-angle chlorite pipe. Thirty-nine points and blades and one scraper were recovered. No special features were present. The site is 35 yards in diameter. Chips collected totaled 160.

RM-7 occurs at the small community of Lynnhaven, 200 yards from the right (east) bank of the South Fork of the Shenandoah River. The southern limit of the site is delineated by a spur of the Norfolk and Western Railroad and State Highway 659, the former serving a flour mill on the riverbank, the latter crossing the river north of the flour mill. The western limit abuts on a dry 5- to 6-foot channel which parallels the course of the river. The northern limit is the owner's home and lawn. The eastern extent is 20 yards from the dry channel.

The occupational refuse, thinly scattered over the whole area, was a little more abundant adjacent to the channel. Collecting conditions were excellent; the tan clayey soil had recently been plowed and washed by rain. Analysis of the 42 points and blades and 184 chips reveals another preceramic "quartzite-using" station. One unclassified sherd, apparently of later occupation, came from the site.

RM-8, 50 yards north of *RM-6* and between *RM-6* and *RM-5*, is separated from the latter by fields of weeds and grass. Collecting conditions on this site were excellent, as they were at the others, the field being planted in corn and recently washed by rain. It extends 125 yards along the road front and 25 yards to the east. Occupational refuse was scattered evenly and thinly over the entire area. The collection consisted of 149 points and blades and 201 chips.

RM-9 is 1.5 miles northwest of Weyer's Cave, a village on North River. It lies on the left (north) bank of North River between State Highway 690 and the river, and 0.75 mile west of the intersection of State Highways 690 and 276.

The site is now in a 6-foot deep gully eroded through sand to a reddish clay hardpan. Small piles of sand left by the river were troweled, producing 4 sherds of unidentified pottery, a crude ax, 2 points and blades, and 29 chips. Unfortunately, the position of this site in the cultural sequence cannot be determined by this limited collection.

RM-10, within the corporate limits of Grottoes, lies on the right (east) bank of South River which flows into South Fork of Shenandoah. The 10 by 20 yards of sandy soil containing thinly scattered refuse is

10 yards from the riverbank. Undoubtedly the site is more extensive than this. The collection consisted of 3 points and blades and 55 chips. No pottery was noted. This assemblage is evidence that the area was used by a preceramic "quartzite-using" group.

RM-11 is located on a 10- to 15-foot terrace between the South Fork of the Shenandoah River and U. S. Highway 12, 6.5 miles southwest of Elkton and 1.25 miles southwest of the bridge at Island Ford. The river flows 100 yards to the west, and the intervening land is a low, flat flood plain covered with sod. At the foot of the terrace embankment is a shallow channel filled with flood water. The eastern boundary is fixed by the Norfolk and Western Railroad laid in close proximity to U. S. Highway 12. The north-south length is 200 yards, without definable limits, owing to undergrowth and grassland.

Collecting conditions were favorable with the clayey, rocky soil plowed for corn cultivation and washed with rain, permitting the accumulation of 31 points and blades, 130 chips, 2 scrapers, 2 steatite fragments, and 1 sherd. The cultural material falls into the preceramic "quartzite-using" horizon.

RM-12 is on the right (east) bank of the South Fork of the Shenandoah River, 0.5 mile southwest of the bridge at Island Ford. The abrupt bank is 15 to 20 feet high, topped by State Highway 642. Occupational refuse was found 10 to 20 yards east of the road on a gentle slope of sandy soil in corn cultivation. It also extends 100 yards along the road.

Mr. Sellers, owner of the land, had a small collection which was analyzed and incorporated into the tabulated summary of artifacts, making a total of 82 points and blades, 193 chips, 1 ax, and 1 scraper. The artifacts, entirely stone, belong to a group having a preceramic "quartzite-using" complex.

ROCKBRIDGE COUNTY

RB-1. This site, contributed to the survey by Howard MacCord, is described (personal communication, 1951) as: "Field just east of Wade's Mill at Brownsburg, Virginia." It was not revisited. The few objects in his collection indicate a station with a preceramic "quartzite-using" complex.

RB-2, Hayes' Creek Mound, was excavated by Mr. Valentine for the Valentine Museum (Valentine Museum, 1903). It is located 2.2 miles northeast of Rockbridge Baths on a broad, sandy, grass-covered plain south of the confluence of Walker and Hayes' Creeks. It has been reduced to an almost unrecognizable feature, its outlines blurred, and at the southwestern side it is only about 18 inches high. Today, a telephone pole rises from it. In order to confirm the location a small

test pit was dug and fragments of a long bone and a skull were located. The soil below the sod was black.

The material removed from this mound by Valentine was largely skeletal but he also reports finding a few sherds of pottery. A visit to the Valentine Museum was unsuccessful in relocating these specimens.

RB-3 was discovered by inspecting the opposite (right or northwest) side of Hayes' Creek from the mound. Here the grassy plain is narrower and had been superficially eroded by floods, the eroded sections extending 25 yards from the creek and 100 yards along it.

Potsherds, chipped-stone artifacts, and chips were strewn between clumps of grass and as many as could be located in a limited time were collected: 19 points and blades, 140 chips, and 22 potsherds. The probabilities are that the Hayes' Creek Mound had been located near or on an older village site, similar to the situation at AU-35.

RB-4 lies within the limits of the small town of Rockbridge Baths immediately east of the intersection of U. S. Highway 39 and State Highway 602. The southern limit is U. S. Highway 39 which has been built on top of a 30-foot cliff formed by North River (into James). A broad sandy plain extends from the river northeastward: In a 10-by-25-yard area, 3 points and 30 chips were located. Of 25 quartzite chips, 22 were purple Erwin quartzite.

In the absence of pottery and the high percentage of quartzite this site probably is a preceramic "quartzite-using" station.

RB-5 is on the right (northwest) bank of Calfpasture River 1.5 miles southwest of the Augusta-Rockbridge County line. State Highway 600 has been built in close proximity to the riverbank and forms the southeastern limit of the small site. The first spring plowing had deeply cut the sandy farmland and exposed, over an area 10 by 30 yards, the following material: 4 points, and 35 chert, 3 quartz, and 3 quartzite chips. In the total absence of pottery this is probably another preceramic "chert-using" station.

RB-6 was discovered immediately southwest of the intersection of U. S. Highway 39 and State Highway 600 on a gradual slope to Mill Creek which is 35 yards to the southwest. Goshen is 2 miles to the southeast.

The sand-clay soil was partly in corn cultivation, and topsoil had been partly bulldozed off in preparation for construction. For 50 yards along the road and 10 yards southwest of it a small assemblage of chipped-stone artifacts was made: 23 points and blades and 146 chips. No potsherds were seen. In view of the prominence of chert and percentage distribution of the chipped-stone artifacts, the site is assigned to a preceramic "chert-using" horizon.

RB-7, Battle or Bell Mound No. 1 and Chief's or Bell Mound No. 2, have been described as follows (Valentine Museum, 1898, p. 58):

Battle or Bell Mound No. 1. Located on the farm of John M. Bell, on Calf Pasture River, about 4 miles from Goshen, Rockbridge County, Virginia. Explored in 1877 by Mann S. and Granville G. Valentine for the Valentine Collections. Contained about 50 skeletons buried in parallel chambers, 2 tiers deep, walled with boulders and covered with slabs of slate. A spear head, a few small shell beads and fragments of burnt-clay pottery accompanied the human remains. Chief's or Bell Mound No. 2. Located on the farm of John M. Bell, on the Calf Pasture River, distant 150 yards from the Battle Mound and about 4 miles from Goshen, Rockbridge County, Virginia. Explored in 1877 by Mann S. and Granville G. Valentine for the Valentine Collections. Contained burnt human bones, with which had been buried hematite paint, sheet mica 11 inches across the face, a polished hatchet, 2 pierced tablets of fine grain slate, a clear quartz crystal weighing about an ounce, and a flat piece of copper about $\frac{3}{16}$ of an inch thick by $2\frac{1}{2}$ inches long.

These mounds were difficult to relocate. Search and inquiry along Calfpasture River did not reveal any mound or anyone who had ever heard of them. There was no property known to have been owned by a Mr. Bell in the late 1800's. An informant in Goshen directed me to a Bell farm on Little Calfpasture River where it was known two mounds had been located. This area is a roughly oval plateau extending from the Knob 1.2 miles to the west and is 2.2 miles southeast of Goshen. The plateau extends to Little Calfpasture River and is 0.25 mile north of what is probably the Calfpasture River. Maps of the area list an upper part of the river as Calfpasture and a lower part as North River. It is difficult to decide where one begins and the other ends.

On the northern part of the plateau the remains of a mound, 6 inches high, 20 feet in diameter, and surrounded by a narrow, shallow ditch, were recognizable. The soil was not charcoal stained but sandy, tan, and hard packed. A few chips were recovered from the surface. One hundred and fifty yards to the west were the probable remains of a second mound.

At the Valentine Museum, in a showcase displaying objects from the Battle Mound, there are 12 Radford Series sherds labeled "Rockbridge County, Virginia," beads, a quartzite Large Triangular Blade Type T, and a polished greenstone celt. Through the courtesy of Mrs. Virginia Claiborne, director of the Museum, I was allowed to search the storage drawers for other sherds. In one, with many human bones, were 220 sherds labeled "Rockbridge County, Virginia." The sherds had the identical labeling as those in the showcase, and the character of the ceramic material of both was identical. It is believed that this material constitutes the "burnt-clay pottery" from the Battle or Bell Mound No. 1.

The pottery is thick, gray to gray-tan in color, has large angular holes from leached limestone temper and in some sherds large chunks of limestone are still present.

PROJECTILE POINTS AND LARGE BLADES

The groundwork of projectile point and large blade classification in Virginia had been made as a companion study to Evans' (1955) ceramic study where it appears as an appendix (Holland, 1955). After much classification and reclassification, these stone artifacts, assembled from many parts of the State, were sorted into 23 types. The classification was largely worked out on modification of basal portions although the blade was by no means neglected. After a satisfactory classification had been established the material was typed by site, the percentage occurrence of each type determined, and the resulting percentages fashioned into bar graphs. It was possible to bring sites from distant parts of Virginia into a single seriation, an aspect of the study which had not been possible with ceramic material.

When the ceramic and chipped-stone seriations, which had been independently developed by Evans and Holland, respectively, were compared, it was found that they mutually supported one another as relative time markers (cf. op. cit. pp. 140-141; figs. 17, 18, 19, 23). This was particularly marked in the Central and North Central Ceramic Area from which a relatively large number of sites with both ceramic and chipped-stone collections were represented. This conformity immediately suggested the possibility that, in a limited area, the chipped-stone material might be as sensitive to changes through time as ceramics. However, the fact that a larger area could be brought into a single seriated sequence argued against this impression. A test case was needed; the limited area of this survey would offer proof of this concept.

A thumbnail description and outline drawings (figs. 2 and 3) of the 23 types of projectile points and large blades of Virginia follow to help the reader understand the interpretations and conclusions of this report, but the reader is referred to Holland's (1955, pp. 165-181) original study for full details.

Small Triangular Type A (fig. 2; Holland, 1955, pl. 24, *a*) is from 1.0 to 2.0 cm. long and 1.0 to 1.6 cm. wide at the base. The outlines are either isosceles or equilateral. Some specimens have excurvate sides but the bases are predominantly straight.

Medium Triangular Type B (fig. 2; Holland, 1955, pl. 24, *b*) is 1.5 to 2.3 cm. long and 1.5 to 2.0 cm. across the base. Both isosceles and equilateral forms predominate.

Triangular Type C (fig. 2; Holland, 1955, pl. 25, *a*) is from 2.5 to 4.0 cm. long and the majority are between 2.0 and 3.5 cm. wide. The blade is generally

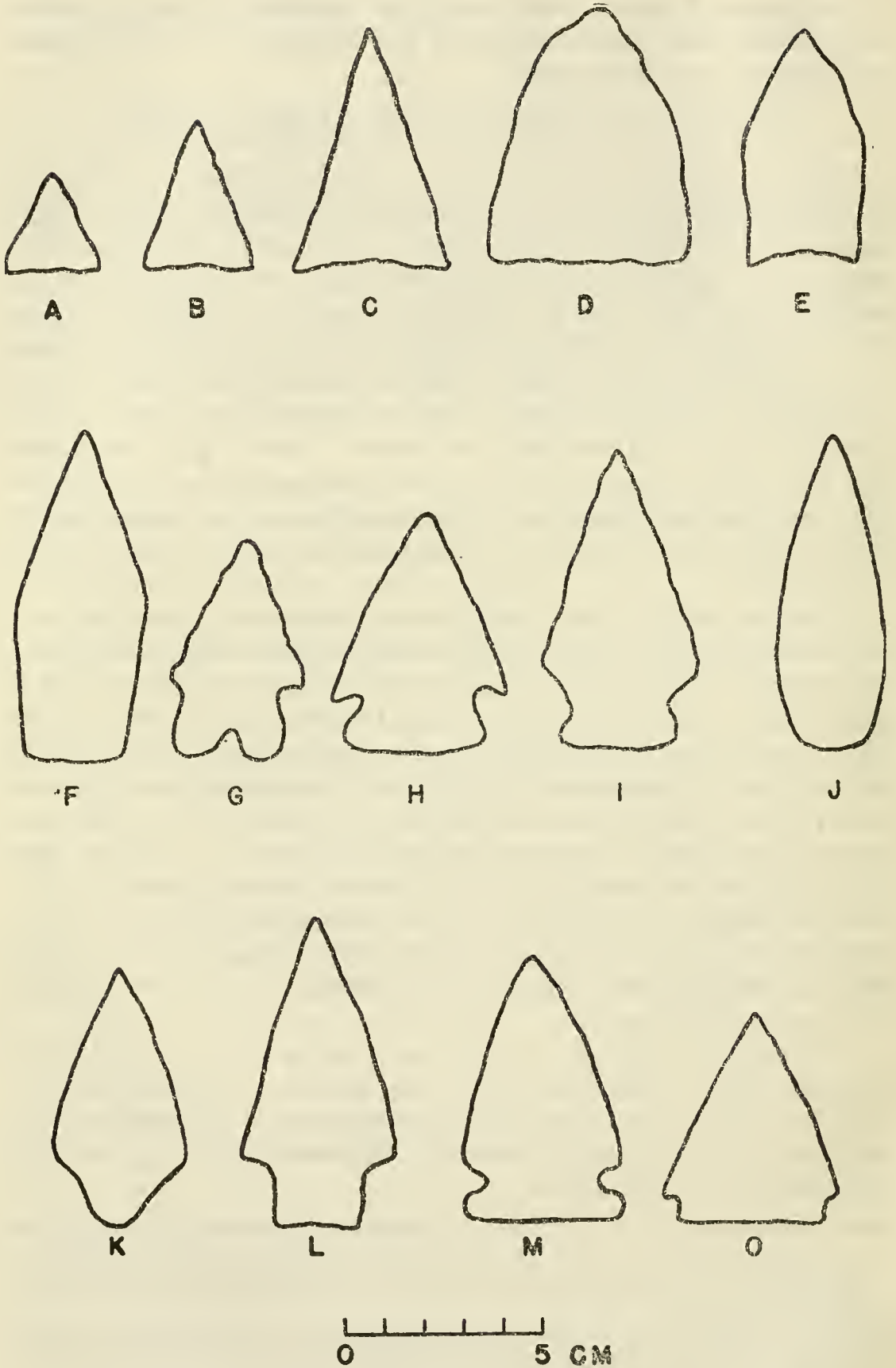


FIGURE 2.—Projectile-point types.

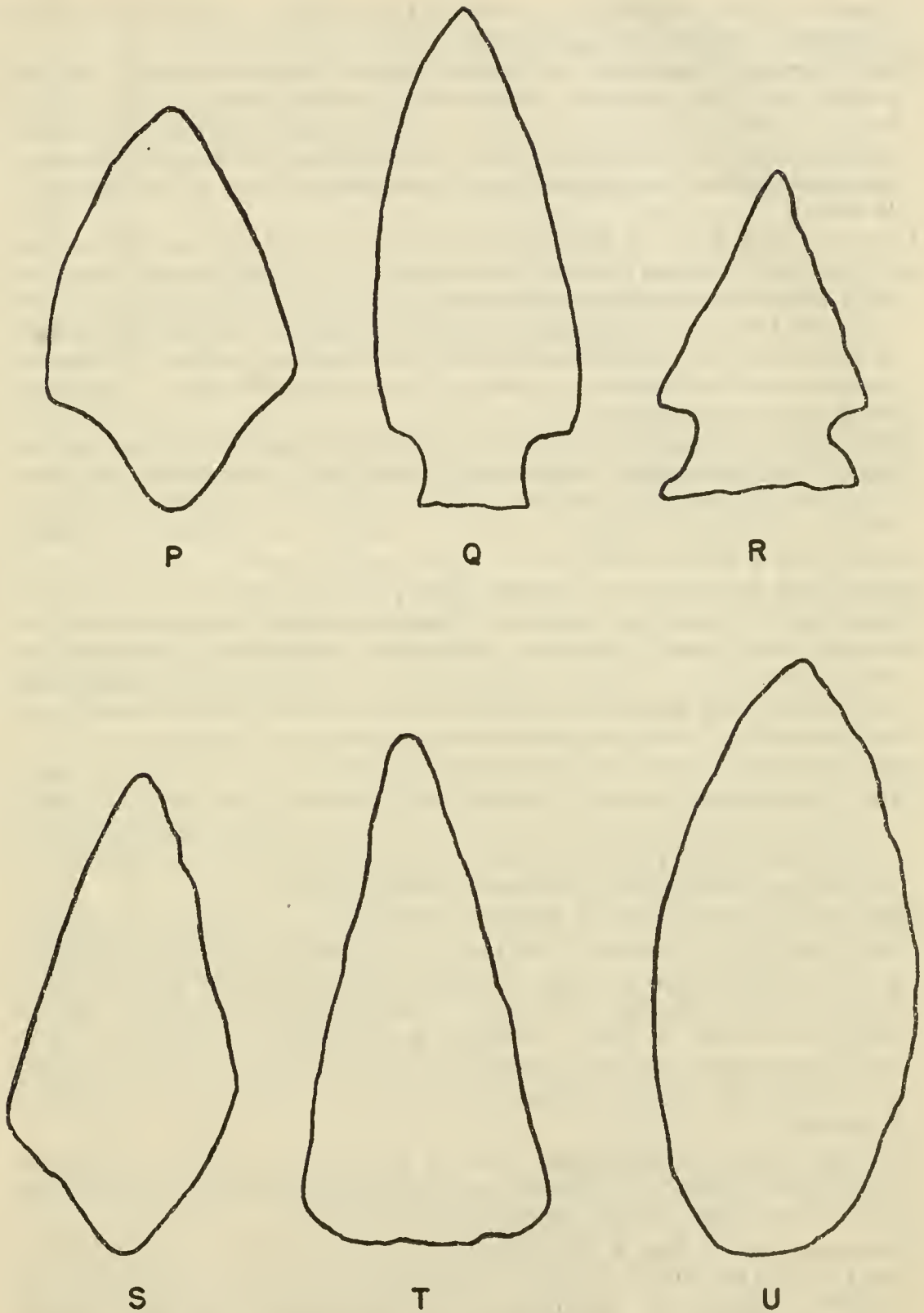


FIGURE 3.—Large blade types.

isosecles. There is more of an incurvate basal trend in this type than in the other two. All three triangular types are thin, 5 mm. or less.

Crude Triangular Type D (fig. 2; Holland, 1955, pl. 25, b) is 2.5 to 7.0 cm. long and 2.0 to 4.5 cm. in width, representing a motley group of crude artifacts having a generally triangular shape. They are consistently thick (to 15 mm.) and the edges are irregularly flaked. This group of artifacts is thought to represent abortive attempts to fashion triangular projectile points of types A, B, and C.

Pentagonal Type E (fig. 2; Holland, 1955, pl. 26, a) varies between 2.5 to 4.0 cm. in length and between 2.0 and 3.5 cm. in width. From the base toward the point the sides are parallel to one another $\frac{1}{3}$ to $\frac{2}{3}$ the length of the blade. The sides then form an obtuse angle and come together at the apex. This produces an artifact with 2 right angles at the base, 2 obtuse angles along the sides, and an acute angle at the apex. These angles are usually rounded. The blades are thin, less than 0.5 cm.

Lanceolate Type F (fig. 2; Holland, 1955, pl. 26, b) is from 2.7 to 8.0 cm. long and from 1.7 to 2.5 cm. wide. Beginning at the base the 2 sides parallel one another for $\frac{1}{3}$ to $\frac{2}{3}$ the length of the blade and then converge gracefully to the apex. There is no definite angulation along the edges of the blade. The blade is usually 0.5 to 1.0 cm. thick.

Notched Base Type G (fig. 2; Holland, 1955, pl. 27, a) is from 2.5 to 4.0 cm. in length and 2.0 to 2.5 cm. in width. The blade is usually separated from the base by small lateral projections or shoulders. The blade is triangular and frequently serrated. The base is indented by a narrow 2- to 4-mm.-deep notch. The lateral angles of the base are rounded and confluent with the curve of the central notch. The edges of the base are parallel below the blade.

Stubby Barbed Type H (fig. 2; Holland, 1955, pl. 27, b) is 2.0 to 4.0 cm. in length and 1.5 to 3.0 cm. in width. The blade is trianguloid with distinctly pointed shoulders which give a barbed effect. The blade is approximately as wide as it is long and since the overall length is relatively short the artifacts have a "stubby" appearance, hence the name "Stubby Barbed."

Notched Stemmed Type I (fig. 2; Holland, 1955, pl. 28, a) is 2.0 to 6.0 cm. in length and 2.0 to 3.0 cm. in width. The blade of the majority is long in comparison to the relatively narrow width. They are oval or diamond shaped in cross section and medium thick (4-7 mm.). The shoulders are rounded and are always wider than the base. The stem is produced by narrowing the blade with two shallow elongated notches. The stem and blade are not sharply demarcated one from the other. The base and notches are sometimes "smoothed."

Ovoid Base Type J (fig. 2; Holland, 1955, pl. 28, b) is 3.0 to 5.5 cm. in length and 1.3 to 3.0 cm. in width. The blade has a long isosecles form, is without shoulders and gradually fades into the rounded or oval base.

Contracting Stemmed Type K (fig. 2; Holland, 1955, pl. 29, a) is 3.0 to 6.0 cm. long and 1.4 to 3.0 cm. wide. The blade is long isosecles in form and diamond or oval shaped in cross section. Shoulders are rudimentary or definite and if definite are generally small. The base is triangular in shape with the base of the triangle toward the blade. The stem may be $\frac{1}{4}$ to $\frac{1}{2}$ of the entire artifact.

Parallel-sided Stemmed Type L (fig. 2; Holland, 1955, pl. 29, b) is 3.5 to 6.5 cm. long and 1.5 to 3.5 cm. wide. The blade is triangular with definite shoulders which may be rounded but are usually angular. The stem is characteristically 1.0 to 1.5 cm. long and symmetrically placed between the shoulders. The sides of the stem are parallel.

Side-notched Type M (fig. 2; Holland, 1955, pl. 30, a) is 3.2 to 5.0 cm. long and 1.6 to 3.3 cm. wide. The blade is triangular with either straight or excurvate sides. The shoulders are formed by notches on either side of the blade which interrupt the extension of the blade to the base. The base is always as wide as, if not wider than, the shoulders.

Unclassified Type N are fragments of projectile points from Type A to Type O which cannot be identified for more specific categorization. Also those projectile points that do not fit any type description are placed here.

Eared or Corner-notched Type O (fig. 2; Holland, 1955, pl. 30, b) is 3.0 to 4.0 cm. long and 2.0 to 3.0 cm. wide. The stem is very short and lacks 4 to 6 mm. of being as wide as the blade. The stem is also generally 3 to 6 mm. long and with straight sides. Occasionally there is a short tang.

Large Contracting Stemmed Type P (fig. 3) is 6.0 to 8.0 cm. long and 3.5 to 5.0 cm. wide. The blade is usually excurvate, 7 to 10 mm. thick. One shoulder is usually angular and the other rounded. These shoulders are usually 10 mm. wide regardless of shape. The stem is centrally placed at the base of the blade and contracts to a rounded angle. Occasionally the rounded angle is replaced by a straight or oblique section. Except for larger proportions this type is similar to Type K.

Large Parallel-sided Stemmed Type Q (fig. 3) is from 6.0 to 14.0 cm. long and 2.8 to 4.5 cm. wide. The blade is trianguloid with straight edges. The stem is centrally placed and joins the blade with angles of rounded contour. The sides of the stem are straight and parallel. Except for larger proportions this type is similar to Type L.

Large Side-notched Type R (fig. 3) is 6.0 to 7.0 cm. long and 2.5 to 4.0 cm. wide. The blade has straight or gracefully excurvate sides. The shoulders are symmetrical and the stem is usually produced by shallow elongated notches. When the notches are angular and oblique they produce an expanding stem with rounded tangs.

Large Pointed Base Type S (fig. 3) is 7.0 to 10.0 cm. long and from 3.5 to 4.2 cm. wide. The blades are consistently excurvate with the maximum width near the center of the blade. The stem tapers to the base, forming rudimentary shoulders which may be present on one side and not the other. This type, except for larger size, is similar to Type K.

Large Triangular Blade Type T (fig. 3) is from 6.0 to 8.5 cm. long and 2.0 and 4.5 cm. wide. The shape is isosceles and the base is straight. Except for large size it is similar to triangular Types A, B, and C.

Large Rounded Base Type U (fig. 3) is 6.3 to 11.0 cm. long and the width ranges from 2.6 to 5.5 cm. The blade is generally triangular or oval and the base is rounded or oval. It is similar to Type J except for larger size. In the survey area more latitude was allowed in this type than the narrow limits set by this description. Some blades were rounded on both ends and occasionally a blade would be rounded on one end and straight on the other.

Large unclassified blades Type V represent fragments of large blades which are so incomplete they cannot be identified as belonging to any other category.

After classification the points and blades were seriated according to accepted procedure (for details, see Evans, 1955, pp. 76-80), completely independent of the pottery. The number of artifacts in each type for each site was calculated, the totals determined, and the percentage breakdown for the individual types worked out on slide rule. These figures are listed as horizontal columns in table 6 of the Ap-

pendix with the projectile points lettered A through O and large blades lettered from P through V. The breakdown into types of rock material is found in vertical columns with totals and percentages at the bottom of each column. The percentage occurrences of projectile-point and large blade types from each site were fashioned into bar graphs on millimeter graph paper with 1 cm. of graph equal to 10 percent, for the experimental seriations.

It was necessary to form two seriation charts. From my previous experience with Virginia artifacts, as well as comparison with the results of others using the same techniques (Ford, 1949, pp. 35-37), a minimum of 50 artifacts is considered the smallest sample which will give reasonably accurate results. The primary seriation, figure 4, is based entirely on 50 or more artifacts per sample and percentages are shown, for easy reference, as solid bars. In the second seriation, figure 5, the relative position of sites with large samples (solid bars) has been maintained, and sites with small samples (20 to 48 artifacts) have been inserted as diagonally hatched bars.

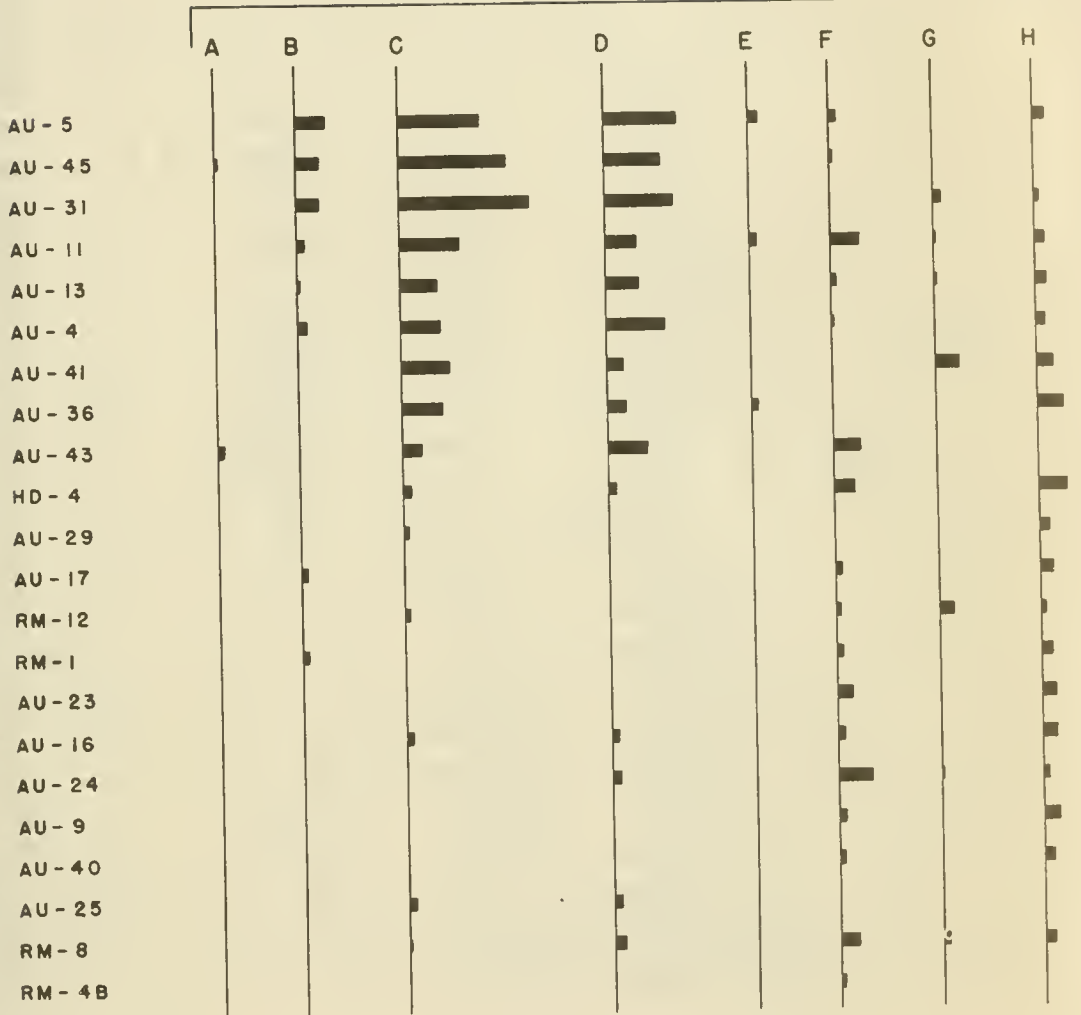
In the text it has been found expedient to divide the exposition into three groups of sites. The first group to be described, and at the top of both seriation charts, belongs to the ceramic horizon. The second and third groups belong to two separate, well-defined pre-ceramic horizons.

Seriation of projectile points and large blades was accomplished in the ceramic horizon first. (Although the stone-artifact collection from site RM-4 was large, this site had to be left out of the seriations because of a mixture of the artifacts with site RM-4A.) There are two reasons for this. It is conceded that ceramic sites are generally later in time than nonceramic sites, therefore the top or most recent period of the chart was established. This temporal hypothesis was not proved by stratigraphy in the survey area, and whether it is of value can only be determined by the results of the seriation. Secondly, from previous studies definite trends of the points and blades of the ceramic horizon of Virginia are known and could be anticipated to appear in this region.

The trends in the previous study (Holland, 1955, fig. 23) were developed by Small Triangular Type A, Medium Triangular Type B, Triangular Type C, Notched Stemmed Type I, Parallel-sided Stemmed Type L, and Large Parallel-sided Stemmed Type Q. Beginning in the preceramic horizon, the triangular forms have a low level of occurrence while Notched Stemmed Type I blossomed and faded. Parallel-sided Stemmed Type L blossomed during the early ceramic period and then faded, a trend followed by its large counterpart Type Q. When Type L had faded to 1 percent and 5 percent, Triangular Type C reached a peak of 30 percent to 56 percent. Type C decreases at

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FIGURE 4

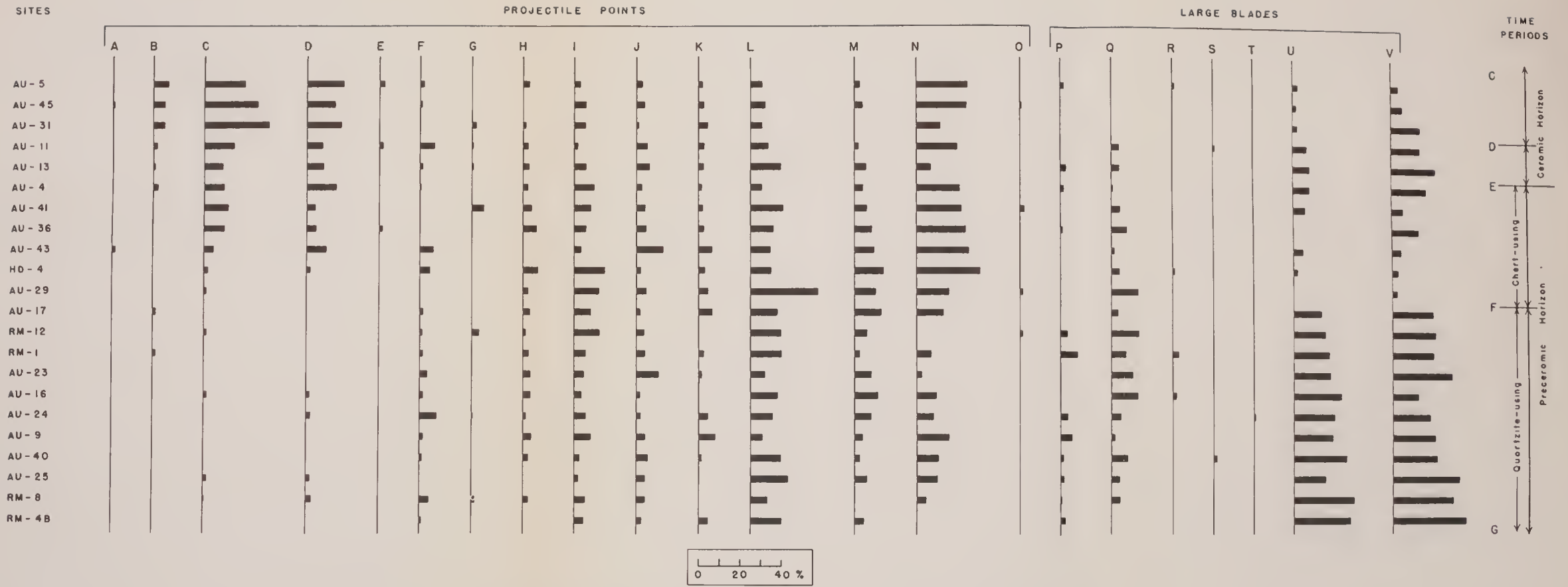


FIGURE 4—Primary seriation of projectile points and large blades from sites with 50 or more artifacts.

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the top of the ceramic period to 10 percent or less and Types B and A are then the most popular types.

With these trends as a guide, five^m ceramic-bearing sites (AU-13, AU-11, AU-45, AU-31, and AU-5) with large collections of points and blades were seriated with increasing percentages of Triangular Types B and C and decreasing percentages of Type L. It was gratifying to note a steady progressive increase in Type B from 0.6 percent to 7.1 percent and a similar though more irregular increase in Type C from 8.7 percent to 19.5 percent while the popularity of Type L declined progressively from 14.3 percent to 5.3 percent. Type I did not show any trends. These trends, when compared with the trends developed for Virginia as a whole (Holland, 1955, fig. 23), reveal that we are dealing with the earliest section of the total ceramic horizon. The later periods, represented by fading of Type C and blossoming of Types A and B, had not been reached by these particular sites.

In the other categories a steady increase is noted in Type D from 8.1 percent to 17.6 percent, a point to be expected if the seriation is correct, for this type represents trianguloid rejects related to the manufacture of Triangular Points, Types A, B, and C. A decreasing trend is noted in Type J from 6.2 percent to 2.7 percent, in Type U from 8.7 percent to 2.7 percent, and Type V from 22.5 percent to 3.5 percent. Trends in the other categories are not readily apparent in a study of this ceramic horizon alone.

If the hypothesis that nonceramic sites are older than ceramic sites is correct, the trends established during this early ceramic horizon are expected to be continuations of similar trends from the nonceramic horizon. Therefore, bar graphs of nonceramic sites were arranged to continue downward and backward in time and to develop the best increasing and declining popularity of types in the ceramic horizon. The first six nonceramic sites (AU-4, AU-41, AU-36, AU-43, HD-4, and AU-29) to continue the trends (figs. 4 and 5) constitute a unit and will be described first.

Type B, with a 2.1 percent occurrence, is present in the uppermost nonceramic site only (fig. 4, site AU-4). Types C and D decrease steadily down the sequence from 9.5 percent and 14.3 percent to 1.2 percent and 0 percent, respectively. Type L maintains the greatest popularity found in the lowest ceramic sites, though somewhat irregularly, at about a 12 percent level of occurrence. An excellent trend has developed in Type M which steadily increases down the chart from 4.1 percent to 10.2 percent. This is paralleled, though irregularly, by Type Q with an increase from 0.7 percent to 13.0 percent. Both trends, begun in the early ceramic horizon, bridge the two horizons. Type I, which shows an irregular occurrence in the ceramic sequence, increases somewhat abruptly in the nonceramic

sequence and appears to be forming an increasing trend as older sites are added to the chart. There is a small but noticeable increase in occurrence of Type K in the lower part of this nonceramic site sequence. Type J continues the same percentage level of the lowermost ceramic sites. Types V and U, instead of increasing, reverse their trends and decline through the sequence. Trends in the other categories are not distinctive.

These six nonceramic sites, selected, as has been said above, solely on the basis of continuing the popularity trends of points and blades of ceramic horizon sites, were later found to have characteristics which set them aside as a definite horizon. After the analysis of rock material (p. 65) had been completed, it was discovered that in these sites 60 percent or more of the rock material used to manufacture the projectile points and large blades had been chert. Therefore the term "chert-using" has been applied to the complex. The full meaning of this is discussed in detail in the section on relationship of sequences (see pp. 80-88).

Again a set of sites (AU-17, RM-12, AU-23, AU-24, AU-9, AU-40, RM-1, AU-25, RM-8, and RM-4B) (fig. 4) were selected and arranged to continue the best trends established by the upper 11 sites. It was immediately evident that trends in the trianguloid series of points, Types A, B, C, and D, had long ago terminated and the presence of any of these types now appeared to be sporadic. Type D occurring at site AU-16, AU-24, AU-25, and RM-8 in 1.8 percent, 2.0 percent, 2.0 percent, and 2.7 percent, respectively, is too low a percentage occurrence to be of any significance and it must be remembered that this type is an unclassified trianguloid anyway, a classification always open to discussion. The presence of Type B at RM-1 can possibly be the occurrence of materials related to the adjoining site, RM-1A, where a higher percentage of chert materials and a few sherds place this site in the ceramic horizon. Under these circumstances this low percentage occurrence of Type B points, one point at both sites AU-17 and RM-1 in a position in the sequence which appears out of order, should not be considered as a violation of the basic trends or meaning of the seriated sequence.

Types I, M, and Q, which had blossomed at the bottom of the first six nonceramic site sequences, maintain their popularity in the upper part of this 11-site sequence, but gradually fade at the bottom to 4.5 percent, 4.5 percent, and 0 percent respectively. Type L maintains its maximum popularity and Types F, H, and J, while showing no increasing or decreasing trends, are present on all sites in low percentages. The most striking changes are shown in the large blade categories, Types U and V. These suddenly blossom and, throughout

the 11-site sequence, hold a steady popularity unequaled in the sites above.

These lowest 11 sites, like the upper 6 nonceramic sites, have, on consideration of the type of rock material, another characteristic which establishes them as a separate preceramic complex. The details of this study follow in the section on relationship of sequences (see pp. 80-81), but it is pertinent to mention that for these sites quartzite was the most popular rock material used to manufacture the points and blades. No less than 74.6 percent of each site are made of this material; for this reason the complex has been named "quartzite-using."

Since we have viewed the seriation in three separate units, it will be well to view it as a whole to see if the three horizons have continuous trends (figs. 4 and 5). This appears to be true. Medium Triangular Type B appears in the "chert-using" horizon and increases steadily through time on into the ceramic horizon. Triangular Type C and Crude Triangular Type D begin at an earlier time level and steadily increase in popularity to the top of the chart. This parallelism between Type D and the other triangular types is so striking that it adds weight to the probability that Crude Triangular Type D is essentially nothing more than an abortive effort, a reject, in the manufacture of triangular-type points. Pentagonal Type E, Notched Base Type G, Large Side-notched Type R, Large Pointed Base Type S and Large Triangular Blade Type T occur sporadically and in small percentages throughout the sequence. Viewed from bottom to top, Lanceolate Type F has a small but steadier occurrence in the "quartzite-using" horizon, being less important in the ceramic horizon at the top of the sequence. Notched Stemmed Type I, Side-notched Type M, Parallel-sided Stemmed Type L, and Large Parallel-sided Stemmed Type Q have their maximum occurrence in the preceramic horizons at a point where the "quartzite-using" and "chert-using" complexes overlap.

As will be recalled Type N includes unclassified projectile-point fragments of Types A through O. A similar unclassified category, Type V, had been established for the blades. It was felt that these groupings were essential to the true understanding of the differences between frequency of blades and smaller projectile points, for so many fragments were large enough to group into one of these categories but too small to subdivide into one of the types based on total shape. Examination of the seriation, figures 4 and 5, shows that Type N is most abundant throughout the ceramic and the "chert-using" complexes (i. e., the upper part of the sequence) whereas Type V is most common in the "quartzite-using" complex. These two unclassified categories indicate how clearly the shift oc-

curs from a predominance of large blades in the lower part of the sequence to a greater popularity of smaller chipped tools in the upper or later part of the sequence.

Using the trends established by sites with a large sample, it was also possible to place all sites but one with small collections of 20 to 48 artifacts in the seriation and maintain the trends already established (fig. 5). The single exception, AU-30, at Natural Chimneys samples had not been collected by the writer but was material exhibited from tunnels and caves in the base of the Chimneys. Not only are the trends of the various types in the sequence maintained by using these sites with smaller collections, but the homogeneity of the characteristics of the various culture horizons are preserved. The inclusion of these sites expands the scope of the sequence, smooths out some of the trends of the various point and blade types, and also permits assessment of the position of more sites in the survey area from both the ceramic and preceramic horizons.

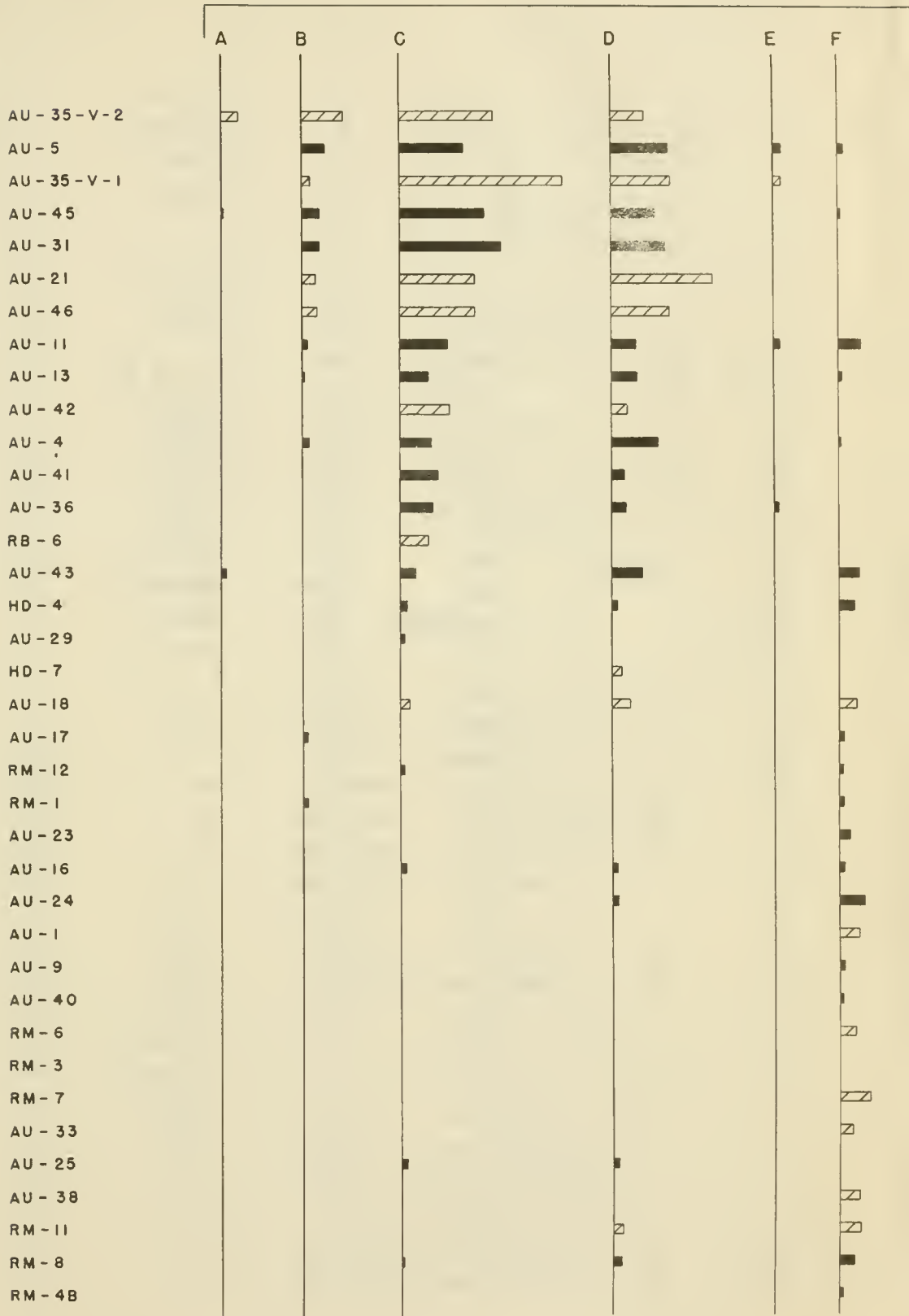
The justification for the use of these sites with small samples, sometimes causing the percentages to be slightly overloaded, can be demonstrated by picking out a few sites and showing how they can only fit into one particular part of the sequence even though some of the individual bars on the graph appear slightly askew.

The placing of site AU-35-V-1 near the upper part of the point and blade sequence (fig. 5) is justified for several reasons. Types B and C are more popular in the upper part of the chart. The limited percentage of any blades from this site definitely rules it out of the lower part of the seriation. Thus, even though the percentage of Type C, with 50 percent, appears highly exaggerated owing to the small sample, this overextended percentage bar does not interfere with the general position of the site or the trends which site AU-35-V-1 helps fill out for Types B, D, and M.

Similar situations are demonstrable with such sites as RM-6 with 39, RM-3 with 31, AU-38 with 45, and RB-6 with 23 specimens. Each fits roughly into the sequence according to noticeable absences of significant point and blade types and takes a specific position as a result of a continuation of the trends established by the sites with the larger samples.

To summarize briefly the results of the seriation of the points and blades from the sites without recourse to the analysis of the pottery or rock materials, the same general trends established for the entire State of Virginia (Holland, 1955, fig. 23) repeat themselves in the limited area of the survey. This seriated sequence of northwestern Virginia, however, smooths out some of the rough spots in the original study and tends to give a more gradual curve to each of the types as a result of having available more sites closely related in time from a limited

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FIGURE 5.—Secondary seriation of

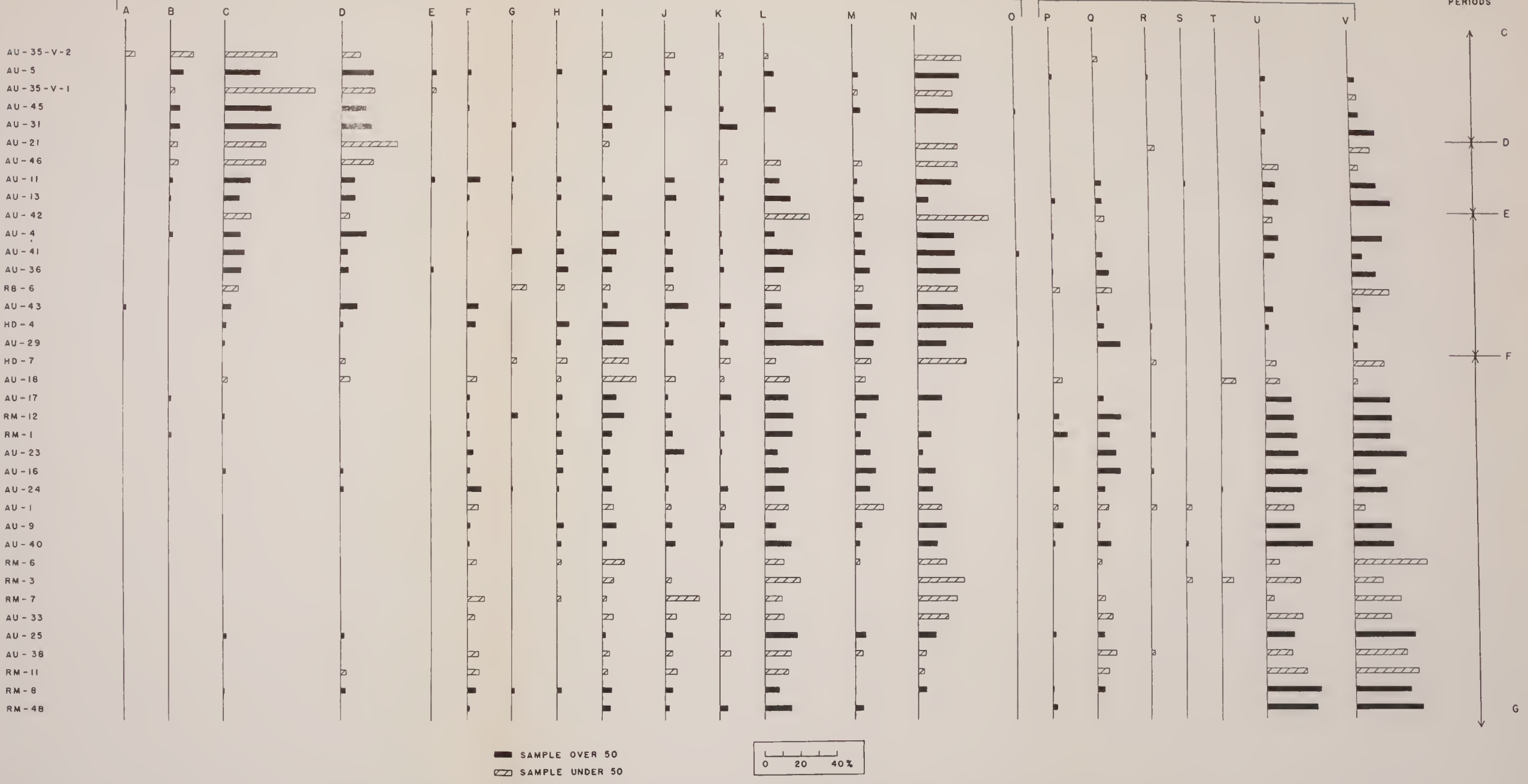
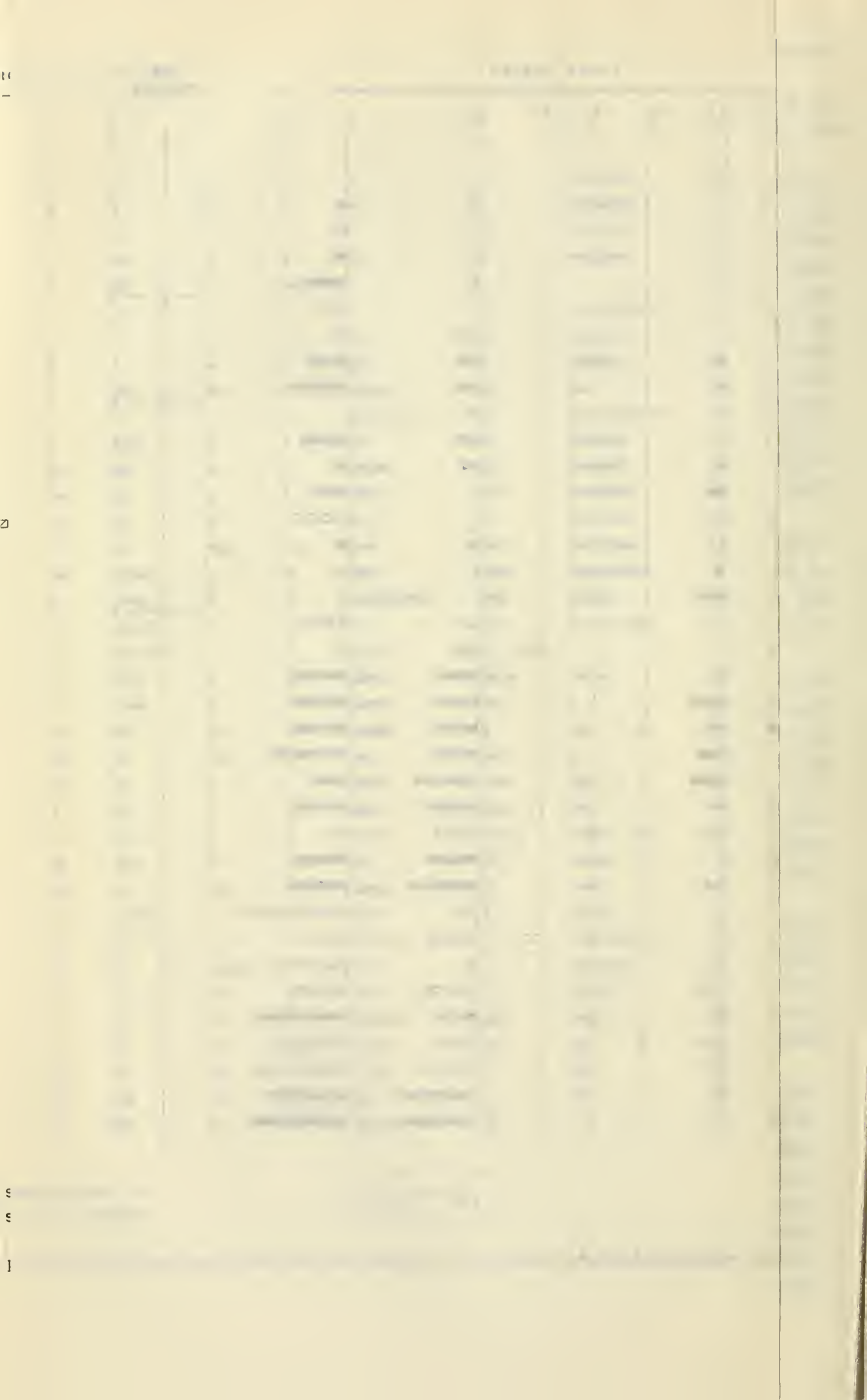


FIGURE 5.—Secondary seriation of projectile points and large blades from sites with 20 to 48 artifacts interdigitated into the primary sequence of figure 4.



geographical area. The strong emphasis on large blade types in the "quartzite-using" complex of the preceramic horizon, the lowest part of the sequence, with the absence of trianguloid forms is of definite importance in helping to define the cultural complex of this period and proves an important time marker in the sequence. Throughout time the popularity of blades declines in favor of the smaller projectile points of various shapes, each with minor fluctuations of its own. In the later part of the sequence, the increased popularity of triangular points, Types B and C, with their related category of probable rejects, Type D, is a point which is of some significance and can be further expanded after those sites with pottery have been seriated independently of this sequence. In short, it appears as if another demonstration has been made in Virginia (cf. Holland, 1955, pp. 174-175) that chipped-stone objects are sensitive to cultural change through time, and the seriation of these changes into a sequence can be useful in establishing a type of time scale where no other artifacts or techniques are available.

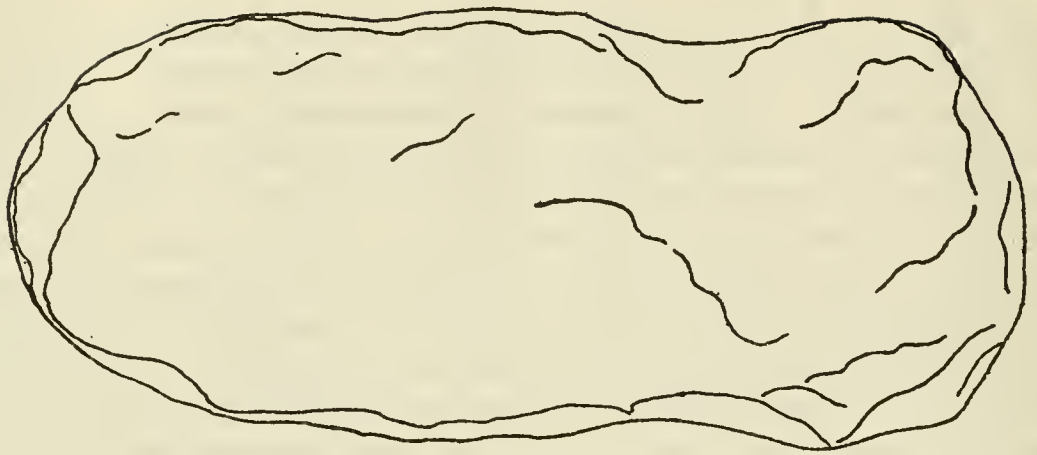
MISCELLANEOUS ARTIFACTS

Artifacts other than pottery, projectile points, and large blades and chips were found in small quantities and with irregular occurrence from site to site. The exact numbers and classification are listed in horizontal columns for each site in table 6 of the Appendix. The type of rock material of which they are made is given in vertical columns. Since there are so few no attempt has been made to reduce them to percentage occurrences by site. The various categories of artifacts are listed below:

Crude axes (fig. 6, a). These were generally cobbles of greenstone that had been shaped by percussion and notched on either edge. The scars of flaking were still present and only occasionally a pecked channel connected the notched edges. The notches were placed to one side of the center of the length. The bit was not modified by grinding. Occasionally a cobble was only notched on either edge and otherwise unmodified. They were generally 8 cm. wide, 10 to 16 cm. long, and 2 to 3 cm. thick.

Crude celts (fig. 6, b). Cobbles of greenstone had been flaked in such a fashion as to form a flat rectanguloid artifact 13 to 16 cm. long, 6 cm. wide across the bit, and 1.5 to 3.0 cm. thick. Scars of percussion flaking made the faces irregular. The bit expanded slightly and the poll was narrowed and either straight or oval. There was no evidence of grinding to smooth either the edges or faces.

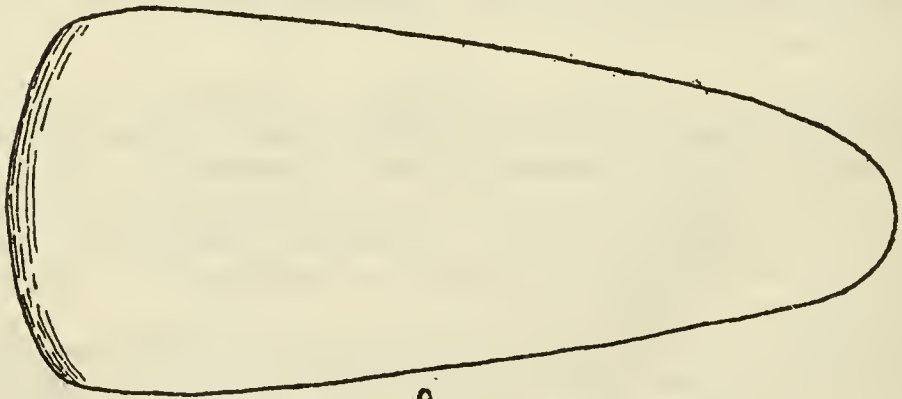
Pecked or polished celts (fig. 6, c). These were modified cobbles of greenstone that had been fashioned into a sharp cutting implement. The bit was straight and sharp and usually wider than the rest of the artifact. The poll was oval or pointed. The faces had been worked smooth and either exhibited the small pits of pecking or were slick from polishing. The majority were 11 to 13 cm. long, 4 to 6 cm. wide, and 2 to 3 cm. thick.



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b



c

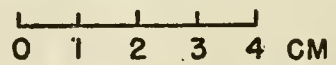


FIGURE 6.—Artifact types: *a*, Crude ax; *b*, crude celt; *c*, polished celt.

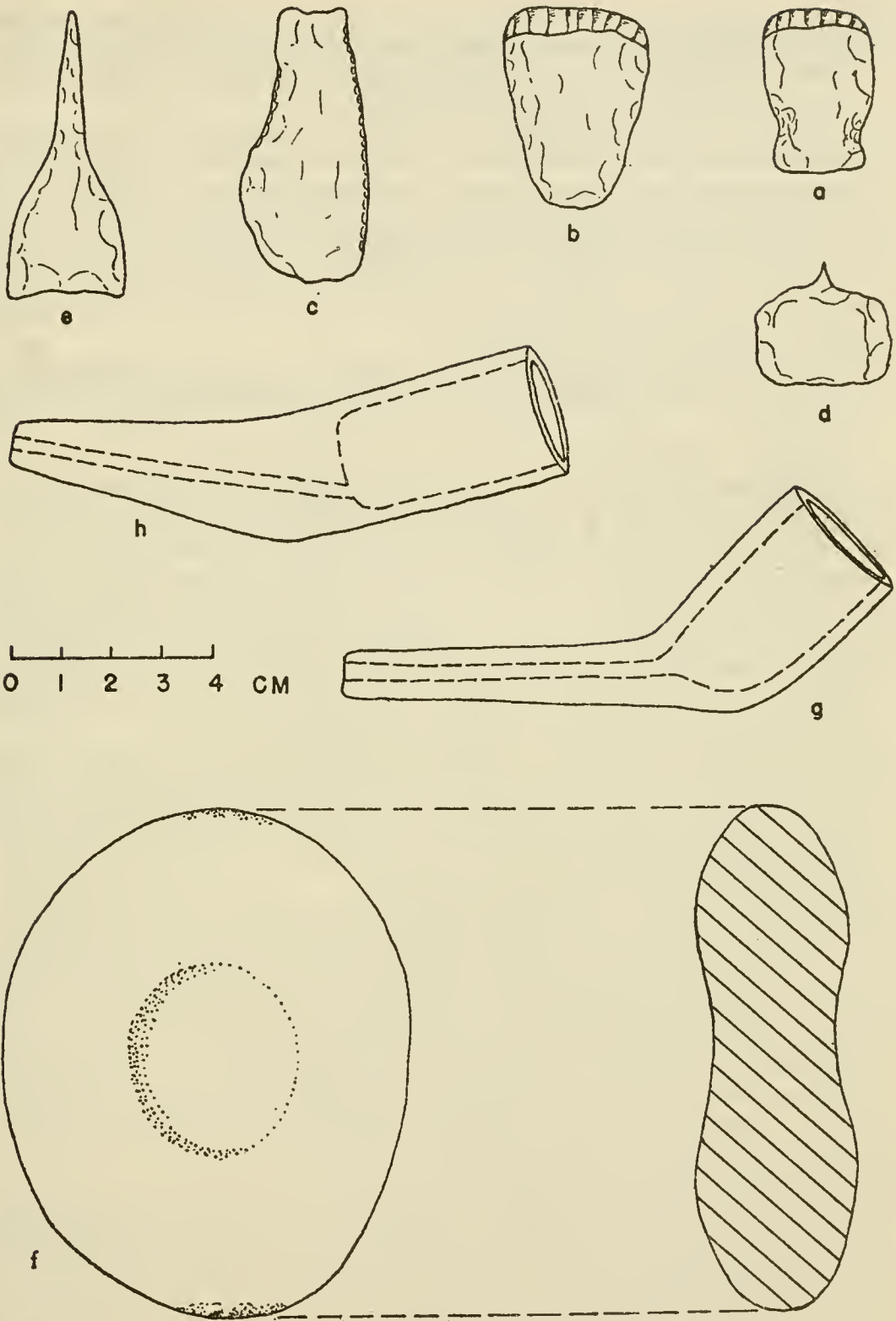


FIGURE 7.—Artifact types: *a*, Hafted scraper; *b*, end scraper; *c*, side scraper; *d*, graver; *e*, drill; *f*, hammer-anvil stone; *g*, chlorite pipe; *h*, clay pipe.

End scrapers, modified for hafting (fig. 7, a). These objects have rectangular blades and one straight or oval end and the other end has either been side notched or stemmed. They appear frequently to have been broken projectile points that have been reworked on the fractured end.

End scrapers (or snubnosed scrapers) (fig. 7, b). These are oval or rectanguloid fragments 3.0 to 3.5 cm. wide, 3.0 to 4.0 cm. long, and 1.0 cm. thick. One side of these artifacts has been modified by secondary flaking to produce a sloping edge. The longer edge is usually sharply angular while the other is rounded. This modified edge may be $\frac{1}{4}$ to $\frac{1}{2}$ the perimeter of the artifact.

Side scrapers (fig. 7, c). These are medium-sized elongated chips that have been modified by secondary flaking on one or both lengthwise edges. There were only three of these found in the entire survey.

Graver (fig. 7, d). These are small, flat, rectanguloid chipped-stone artifacts that have had one edge modified to form a short, sharp, triangular point. Only 4 were found.

Drills (fig. 7, e). This class was defined on the basis of an elongated narrow blade, usually diamond shaped or oval in cross section, with an expanding base, or, as occasionally seen, no modified base but a continuation of the narrow blade from one end to the other. The blade varied between 0.5 and 1.0 cm. wide and the overall length was 4.0 to 5.0 cm. The expanding base was roughly rectangular or triangular in outline. T- or Y-shaped specimens were not encountered.

Mano. Only one specimen, found on a preceramic "quartzite-using" station that had been resettled during the ceramic horizon (RM-4A). This roughly oval specimen had a flat surface for grinding and the opposite side was rounded, measuring 10 cm. long, 8 cm. wide, and 4 cm. thick.

Hammer-anvil stones (fig. 7, f). These were oval quartzite river cobbles, usually 10 cm. long, 8 cm. wide, and 4 cm. thick, that had been battered along one edge and were pitted on one or both faces. The pits varied from shallow, circular pecked areas in the center of a face to 1.5 cm. deep. The pits indicate that they may have been used also as anvil stones.

Pipes, chlorite (fig. 7, g). A number of pipes were observed during the survey in local collections and at the Valentine Museum. Those in local collections were not accompanied by provenience or else the data was so meager (AU-19) that the pipe could not be assigned to a horizon. At AU-11 a large fragment was from an obtuse angle pipe with a round bowl and flat stem. Fragments were discovered at two sites (AU-31 and AU-18) but reconstruction of the entire artifact was not possible. Pipes found in mounds (AU-35-M, and literature) either lack data of provenience or occur during the Late or Middle Woodland periods which are not well represented by the survey.

Pipes, clay (fig. 7, h). The only complete specimen seen during the survey was from the Hayes' Creek Mound (RB-2). This was an obtuse angle pipe in imitation of a similar chlorite specimen from the same mound and also similar to the chlorite pipe found in the excavation of AU-35-M. One fragment from AU-13 is a right-angle type made for insertion of a stem. The other fragment from the same site in the collection of Jerry Brownlee had a tapered stem. The fragments from HD-2 were so incomplete they could not be reconstructed.

Soapstone vessels. This category refers to fragments of soapstone vessels that have been broken. No complete vessel was found.

Quartz crystal. Both Fowke (1894) and the Valentine Museum (1903) mention the occurrence of quartz crystals during their excavations. The ones collected during the survey were small. None had been modified.

Pendants. Only one complete pendant was discovered with a burial at AU-35-M. The others were fragmentary and reconstruction was not possible. In general they appeared to be elongated, drilled from both faces to the center.

Table 3 was organized to bring these artifacts into proper time relationships. Sites were arranged in a vertical column with the most recent at the top of the table to the oldest at the bottom according to the adjusted seriated sequences of pottery, points, and blades. The number of specimens found on each site is listed under its appropriate category.

TABLE 3.—*Distribution of miscellaneous artifacts at various sites, arranged according to the temporal sequence based on ceramic and projectile-point and blade seriations*

Site	Ax: crude	Celt: crude	Celt: pecked/ polished	End scraper (hafted)	End scraper	Side scraper	Graver	Drill	Mano	Hammer-anvil stone	Pipe: chlorite	Pipe: clay	Soapstone ves- sel fragments	Quartz crystal	Pendant
Ceramic:															
HD-2												2		3	
AU-35-M										2	1				1
AU-44	1														1
AU-35-V-1			1					2							
AU-5			2		3	1		2					2		
AU-45		1	1			1		4							
AU-46										2					
AU-31		4	16		1			5			1				
AU-21	1	1	1		1										
RM-4		12						1		1				1	
AU-13		5			3		1	1				2	9	1	
AU-11	2	12	4					4			1		2	1	
AU-26													3		
Preceramic:															
AU-4		1	1					2							
AU-41				1	2	1									
AU-36					3										
AU-43													1	1	
HD-4				1	7										
HD-6					1										
AU-25	1			1	1		1								
AU-18	3	4	2								1				
AU-16				1											
RM-12	1				1										
RM-1	3		1	2											1
RM-6					1										
RM-11					2								2		
AU-33	1			1	4			1		1					
AU-17					1			1							
AU-38								1							
AU-24	7	3						2							1
AU-40	2	1		1	1		1								
AU-23		1			1								1		
RM-5	1						1								
AU-32			1												
AU-14	1	3													
AU-15					1										
AU-22					1										1
AU-32			1												
AU-8		1													
AU-34					1	1									

The number of artifacts for each category is too small to be useful for any other purpose than absence or presence in certain periods of the time sequence. Reliable trends are not observable for such small collections. Examination of table 3 presents some interesting groupings of artifacts as a result of plotting them in a temporally

ordered sequence. In the ceramic horizon, drills, polished and pecked celts, chloritic schist and clay pipes, fragments from soapstone vessels, and natural quartz crystals are most common. In the pre-ceramic sites, crude axes, end scrapers, and the hafted variety of end scrapers are found in greater numbers. What this means is that if these artifacts are found in sufficient numbers at a site they may be useful in establishing the general position of the site in the ceramic or preceramic time sequence for the area. From another point of view these artifacts of infrequent occurrence can serve as an excellent check on the other data from a site. For example, if a site seems to conform to one part of the time sequence but has a series of celts, pipes, drills, etc., which seem to fit more closely to the opposite part of the sequence, the data suggest that possibly the site had been occupied by two groups at widely different times and some method must be derived to separate the artifacts into two distinct groups. For this purpose of serving as a double check, the less abundant miscellaneous artifacts were always considered in this study.

ANALYSIS AND INTERPRETATION OF THE POTTERY

Since the aboriginal pottery from Virginia has been analyzed and interpreted in the survey made by Evans in 1950 and published under the title "A Ceramic Study of Virginia Archeology" (1955), it is essential here to classify the pottery from northwest Virginia into Evans' types and seriated sequences. In order to assure the comparability of pottery classification of the earlier study and the materials from the current survey, Evans classified all the pottery in this study. One major aboriginal ceramic area, the Allegheny (op. cit., pp. 103-108) of Virginia applies to the present survey. Evans has divided the Allegheny Ceramic Area into a Southern Division and a Northern Division with the whole region covering the area west of the Blue Ridge Mountains. Although the pottery types most typical of this area predominate in some sites, an interesting situation occurs in those sites bordering the boundary line of the Central and North Central Ceramic Area, which suggests direction of the aboriginal movement or diffusion into northwest Virginia.

A study of the sherd collections from the survey area reveals five of the eight major Virginia pottery series present in various degrees of popularity. They include the Albemarle, Marcey Creek, New River, Radford, and Stony Creek Pottery Series. A thumbnail summarized description of these follows, but the reader is referred to Evans' (1955) report for the complete descriptions, photographs, and line drawings of rims and vessel shapes.

Albemarle Pottery Series (Evans, 1955, pls. 4, 5, 6, fig. 3):

A group of pottery types on a ware typically light red to orange, sometimes gray-red, sandy textured with a crushed-quartz temper (rarely with crushed granite or greenstone) which are angular, medium to large particles. Manufactured by coiling. Decoration consists of punctures with a sharp stick or narrow slits on the rim. In the majority of cases the rim is fairly vertical or tapers slightly inward and only rarely slopes outward. The shapes are typically round-bodied pots with straight sides or with a slightly constricted collar and short vertical rim.

The above-mentioned ware has been classified into five pottery types based on surface treatment: Albemarle Plain, Albemarle Cord Marked, Albemarle Fabric Impressed, Albemarle Net Impressed, Albemarle Simple Stamped, and Rivanna Scraped. Albemarle Cord Marked surfaces had been beaten with a cord-wrapped paddle, the cord being, in most cases, a simple, double-twisted, two-strand cord ranging from medium to coarse in size. The surface was paddled when the clay was moderately soft. The fabric impressions had been made with a plain plaited fabric with close, fine weft and a medium coarse to wide, heavy warp. Albemarle Net Impressed variety had been marked with a wide open knotted net deeply impressed in wet clay.

Albemarle Simple Stamped had been beaten with a paddle wrapped either with smooth thongs or roots or a paddle with faint grooves. Rivanna Scraped variety was produced by an irregular tool when the clay was very wet.

Marcey Creek Pottery Series (Evans, 1955, pl. 12, fig. 6):

A group of pottery types characterized by a light-tan to red-brown to gray-red color, soft paste, soapy texture and feel, crushed-steatite temper, very irregular, uneven, lumpy surfaces. The majority of vessels were apparently hand modeled, patched, or kneaded, while a few sherds suggest coiling. The rims are fairly thin compared to the body wall and are either vertical or out-sloping. There is an occasional nicked rim by way of decoration. The sherd samples suggest direct copy of typical steatite vessels which are either oval or rectangular bowls with flat bases, irregular surfaces, curved to straight sides with an occasional handle at the ends.

Two types are recognized: Marcey Creek Plain and Selden Island Cord Marked. The plain type is smoothed by hand only, rough to the feel, very uneven and irregular with lumps of temper protruding through the paste. Selden Island Cord Marked, impressed with a cord-wrapped paddle, has a haphazard, overlapping, crisscrossing or diagonal pattern.

New River Pottery Series (Evans, 1955, pl. 13, fig. 7):

A group of pottery types on a ware characterized by a gray-tan surface, with crushed-shell temper, incompletely fired in an oxido-reducing atmosphere producing a gray-cored paste. The majority of the sherds suggest modeling or patching as the method of manufacture. Decorations, which are frequent on the rim sherds, are gashes, finger pinchings along the lip, lower edge of the folded-over rim or along the collar. There are rounded loop handles and generally the shapes are round jars with globular bodies, short to medium-sized necks, the orifice smaller than the greatest body diameter and with a recurved or vertical rim.

Four types have been defined. New River Knot Roughened and Net Impressed has been paddled or rubbed on the exteriors with a knotted net, leaving a coarse, rough surface with impressions of knots and a few of the mesh lines. Usually the mesh of the net is obliterated, suggesting roughening with a crumpled net. New River Cord marked type has been haphazardly beaten with a

cord-wrapped paddle forming parallel or crisscrossing patterns. Nonoverlapping, parallel impressions are most common. New River Fabric Impressed type was treated with a fabric of plain-plaited or twisted varieties. Often the fabric has been applied several times in one area as if wrapped on a paddle or around the hand. New River Plain has both interior and exterior surfaces smoothed over, but is still fairly uneven and irregular; sometimes the interior is scraped.

Radford Pottery Series (Evans, 1955, pls. 16, 17, fig. 9):

A group of pottery types on a ware characterized by gray to gray-tan color, a gray to black core resulting from incomplete firing in an oxido-reducing fire, crushed-limestone temper, and with distinctive rim and vessel shapes. The rims are either incurving, straight, or incurving with a thickened or folded-over lip, decorated with finger pinching, small gashes, lightly incised lines and, rarely, a raised rib. There are infrequent strap handles. They were generally made by hand modeling or patching, although some sherds show coiling. The vessels are rounded jars with globular bodies, the orifices of which are smaller than the bodies.

This series has four pottery types. The surfaces of Radford Knot Roughened and Net Impressed had been beaten with either a net-covered hand or paddle, creating a haphazard, overlapping, rough surface with knot and cord impressions. It was apparently treated when the clay was leather dry. Radford Cord Marked type had been beaten with a cord-wrapped paddle without too much overlapping or crisscrossing. Radford Fabric Impressed sherds are impressed with a plain-plaited or twined fabric. The majority suggest that this fabric was wrapped around a paddle or the hand and the exterior surface beaten or rubbed. Radford Plain Type is smooth but uneven.

Stony Creek Pottery Series (Evans, 1955, pls. 18, 19, 20, fig. 10):

A group of pottery types characterized by fine quartz sand temper, gritty and sandy texture, light tan to light orange or light red-tan surfaces, fired in an oxidizing atmosphere. Coiling as the method of manufacture is evident on the majority of the sherds. Typically, there is no decoration. A variety of shapes were reconstructed from the sherds. There were deep open bowls with subconoidal to conoidal bases; globular-bodied jars with conoidal bases and with insloping straight sides forming an orifice smaller than the body diameter, and tall pot forms with conoidal or subconoidal bases.

Seven types are recognized. Stony Creek Cord Marked has been treated with fine to medium-fine cords, typically in a crisscrossing, well-executed, overlapping pattern, usually diagonal to the rim. Stony Creek Fabric Impressed type is difficult to analyze because the sandy nature of the paste caused the sherd surfaces to erode easily. A characteristic of the type is the faintness of the fabric impressions even on uneroded surfaces, suggesting application when the clay was leather dry. Stony Creek Simple Stamped sherds have been beaten with a paddle wrapped with smooth thongs or thin, smooth roots or grass. The decorated type, Nottoway Incised, has the exterior treated as the fabric-impressed type, then the incisions were made with a flat, blunt stick, applied crudely and unevenly to the rim and body. Motifs are diagonal lines extending from the lip, haphazard crosshatching, double chevrons, paired lines, and triangles. Stony Creek Plain has smoothed, fairly even and regular interior and exterior surfaces. Rivanna Scraped is scraped or combed with a tool, leaving small irregular serrations.

The basic differences in temper, paste, firing, manufacture, and decoration of each pottery type are fairly easy to distinguish once one

has had a little experience with pottery typology and classification. The numerical and percentage breakdown by series for each sherd collection arranged by site is found in the Appendix, table 7. The percentages were plotted as bars on strips of graph paper with a scale of 1 cm. equal to 10 percent arranged in columns wide enough to accommodate the greatest percentage in any one series. A collection of 50 or more sherds was considered usable with a fair degree of accuracy (Ford and Willey, 1949, pp. 35-37); these were plotted as solid bars. The four collections with sherd samples between 22 and 47 were plotted with diagonal lines to suggest uncertainty of the results due to a small sample.

The bottom of the seriation (fig. 8) was fixed, in part, by reference to Evans' ceramic study (1955, fig. 18). He had noted pottery types characteristic of the Central and North Central Ceramic Area spilling over into the northern district of the Allegheny Ceramic Area (*ibid.*, pp. 103, 108). Therefore, reference to his seriation in the former area indicated that sites with a high percentage of Stony Creek Pottery Series, relatively smaller percentages of Albemarle Series, and the presence of Marcey Creek Series are in the lowest part of the sequence.

The bar graphs of two sites, AU-26 and AU-11, having the three requirements mentioned above were placed at the bottom of the seriation (fig. 8). According to Evans' study the Stony Creek Series would fade as the Albemarle Series blossomed (*ibid.*, p. 100, fig. 18); the next four sites (AU-13, RM-4, AU-31, and AU-21) were arranged accordingly. Good trends, though foreshortened by the limited number of sites, appeared. The Stony Creek Series decreased from 60 percent to 10 percent, while Albemarle increased from 32.2 percent to 89 percent.

Following on the six-site sequence developed above, six more sites (AU-45, RB-3, AU-5, AU-35-V-1, AU-44, and AU-35-V-2) with Albemarle and Stony Creek Series were seriated to continue and develop the best trends of the first six sites (fig. 8). It became immediately apparent that a new ceramic influence had reached the area. The Stony Creek Pottery Series, as expected, continued to decline to 3.2 percent and 2.7 percent, but the Albemarle Series, instead of continuing to increase as it had in the Central and North Central Ceramic Area, began to fade as the Radford Pottery Series blossomed. This new influence, although present in low percentages (up to 5.8 percent) at the bottom of the seriation increased to 40.3 percent at the top of the 12-site sequence.

The five remaining sites with ceramic samples presented a problem. Four had high percentages of Radford Pottery Series, only one had a trace of Albemarle, and only one had any Stony Creek Series. Were the samples (HD-9 and RB-7) found in the two museum collections so



FIGURE 8.—Striated sequence of sites based on pottery.

highly selected that they would not show any trends in a seriation study? Traces of the New River Series had been present in the 12-site sequence already developed and there was none in the four samples with a high percentage of Radford Series. The fifth site had a high percentage of the New River Pottery Series and a very low percentage of Radford Pottery Series.

To resolve these difficulties it was decided to seriate the four sites (HD-2, RB-7, BA-1, and HD-9) with the high percentages of the Radford Series as a group to continue the trends which had been developed by the sequence (fig. 8). HD-2, an excavated midden, had a trace (3.5 percent) of Albermarle Series and the lowest percentage of Radford Series (96.5 percent). This was placed on the bottom of this four-site sequence, and the others fell into place with increasing percentages of Radford Series and an absence of Albermarle. Obviously, then, a gap existed in the sequence. More sites would doubtlessly bridge the gap by showing a progressive loss of Albermarle and an increasing percentage of Radford. Stony Creek Series pottery, which had already declined to a trace, would either continue as a trace (as on RB-7) or would be absent entirely. The probabilities are that the New River Series would not appear in any large percentages and more than likely would be absent on most of the sites.

The question of selectivity of sherds in the museum samples (HD-9 and RB-7) is not answered positively. However, they seriate well with two excavated middens having 96.5 percent of Radford Series or more, which indicates that there was a blossoming of the Radford Series to such a degree that it represented practically the entire ceramic complex on certain sites in the survey area.

The question now arose as to whether the top of the seriated sequence was represented by the blossoming of the Radford Series (fig. 8). This did not seem possible for two reasons. In the northern district of the Allegheny Ceramic Area, the Keyser Farm site, proposed by Griffin as having been occupied in the post-Columbian era (Manson, MacCord, and Griffin, 1944, p. 413), had a ceramic complex with variants of the Radford and New River Pottery Series. With this temporal assignment and the trace of New River Series in sites so far discussed, it was expected that the top of the seriation had not been reached. In the southern district of the Allegheny Ceramic Area the excellent sequence developed by Evans (1955, fig. 19) showed that here Radford blossomed at the bottom of the sequence and faded with the expanding of the New River Series. With these two studies as guides, it was obvious that the top of the seriation sequence should be represented by relatively large percentages of the New River Series and either no Radford Series or moderate percentages of it. The only site to fit this distribution is AU-2, and, therefore, it has been placed

at the top of the seriation (fig. 8). Again the intervening sites with Radford Series pottery declining and New River Series pottery increasing have not been discovered as yet in the survey area. This lack is shown on the seriation chart by a gap.

In summary the following generalizations may be made: The earliest ceramic complexes of the Central and North Central Ceramic Area existed coevally in the northern district of the Allegheny Ceramic Area. Two distinctive ceramic complexes, limestone-tempered Radford Pottery Series and shell-tempered New River Pottery Series, moving in from the west or southwest, disrupt the ceramic patterns of this latter district but do not have any influence on patterns in the Central and North Central Ceramic Area. The earliest of these new ceramic influences, the Radford Series, appears in percentages of 96.5 to 100 percent at a relatively later period in the area of this survey than it does in the southern district of the Allegheny Ceramic Area. In the southern district it appears as a well-developed complex at the bottom of the seriation for that area. In the survey area there is a gradual transition from the Albemarle and Stony Creek tradition to the 100 percent Radford tradition. The late ceramic influence, the New River Series, is not well represented in the survey area but its occasional presence is of importance in marking the most recent time levels.

Let us compare the results of the point and blade seriation (fig. 5) and the seriated sequence based on pottery (fig. 8), which were derived independently of each other. It was impossible to collect uniformly large samples of both pottery and chipped-stone materials from ceramic-bearing sites. Therefore certain sites appearing on the ceramic seriation are not found on the projectile-point and large-blade study, and vice versa, although a tabulation of the artifact sample is shown in tables 6 and 7 of the Appendix. Although there is not 100 percent agreement in the order of those sites that appear in both sequences, a sufficient number are in the same relative positions to suggest that the two forms of evidence can be used independently with some degree of accuracy. To be specific, the relative positions of sites AU-11 and AU-13 are the same—at the bottom of the pottery-type sequence and at the beginning of the ceramic-bearing sites in the point and blade sequence. However, their sequential positions are reversed, a matter of not too serious concern at this stage of the comparison. Sites AU-21, AU-45, AU-35-V-1, and AU-35-V-2 maintain not only their relative positions but also their sequential positions. It will be recalled that although the stone artifact sample of RM-4 was so mixed with RM-4A that it was impossible to separate the various cultural complexes and use the sample successfully in the point and blade seriation studies, the pottery sample was clearly a unit in itself. Its

position near the bottom of the pottery sequence helps smooth out this part of the curve.

There is little doubt that about twice the number of sites with large enough pottery samples to use would have helped smooth out the seriation sequence based on pottery, for there are apparently three distinct gaps (fig. 8) not bridged at the moment by the available sample of this survey. Nevertheless, with the support of these standard ways of developing sequences by seriation of pottery, points, and blades, several unique approaches will now be proposed and can be checked against the results of the established sequences.

ROCK MATERIAL

It became apparent early in the survey that the type of rock from which the artifacts were made would be of considerable importance. This was not only determined by the present survey but had been observed, although not fully developed, in the earlier general Virginia survey (Holland, 1955, pp. 175-176). For example, in Albemarle County to the east, it was found that preceramic sites showed a preference for quartz with quartzite of secondary importance. In the Stony Creek district there was preference for quartzite in the early ceramic horizon. Late ceramic sites in southwest Virginia showed a rock material preference for chert. In other words there was diversity of popularity of rock material at various time levels and in various localities. No definite conclusion could be drawn at the time except that although some cultural preference probably existed, the convenience of local supplies appeared to be the greater determinant.

Directly north of the survey area, Fowke (1894) described differences in popularity of rock material at various sites. At the Kite Place in Page County (op. cit., p. 44), which adjoins Rockingham, he mentioned that a peck of well-finished quartzite arrowpoints or spearheads was found in the center of a mound. On the Phillip Long Farm (op. cit., p. 46) in the same county there were flint and crystal artifacts. At Ruffner Place (op. cit., p. 48) he noted the presence of both quartzite and flint in quantity. At Rileyville, on the Huffman Farm (op. cit., p. 55), he noted eight triangular, black flint knives and "Two feet from these, at a slightly lower level, was a double handful of quartzite chips and spalls." In other words, flint (actually chert and not true flint) and quartzite had been reported by others to be popular in the area covered by the survey. A distinction in time might exist, but it was not clearly discernible from Fowke's writings.

At the beginning of the survey I realized that certain sites would not have a sufficient number of chipped-stone artifacts to integrate them into a seriation study; however, on these same sites chips were abundant. I concluded that if time distinctions could be shown by

preferences of rock in the manufacture of chipped-stone artifacts, an advantage could be derived from a study of chips. Those sites with adequate collections of artifacts could serve as controls in the study of the chips.

A chip was defined as the more or less flat flake removed either by percussion or pressure during manufacture of stone artifacts. Large angular chunks, called cores, were not included since their occurrence was not common enough on each site to be of any practical use. It was believed that 100 or more chips would preclude any gross percentage error caused by accidental breakage. The chip size varied from minute fragments obviously removed by pressure flaking to large spalls, 4 by 8 centimeters, with pronounced striking platforms.

At first, chert was divided by color, jasper and chalcedony were kept separate, quartz was divided into clear (crystal or near crystal) and white (milky) types, and quartzite by color. In the "South Rivers District" quartzite is usually gray or tan and in the western portion of the survey area there is a preference for a purple Erwin quartzite. Greenstone did not appear divisible into smaller categories, although green and bluish phases were recognized. Preliminary study revealed these smaller divisions were purposeless, thus classification was reduced finally to chert (sometimes including a very small percentage of jasper and chalcedony), quartz, quartzite, and greenstone.

A special technique was devised for collecting the chips. Careful inspection was made of the entire site to note the surface distribution of the chips representing all types of rock materials and particularly to see if any concentrations were present. Sites under cultivation were ideal for this phase of observation. If no concentrations existed, it was part of the technique to pick up every chip until 100 or more had been accumulated. If a concentration did exist, a separate collection was made from it as well as other areas and the results compared. The technique was tested by collecting several samples months apart and from varying sections of a site. The results of this have been incorporated into the site descriptions, especially sites AU-4, AU-11, and RM-4B.

The numerical and percentage occurrence of types of rock material will be found in horizontal columns at the bottom of table 6 in the Appendix. If two collections have been made, they have been placed in the tables as collections A and B, each with separate percentage calculations.

A crucial test for use of chips in this study is the correlation between the percentage occurrence of the various rock materials of chips and projectile points and blades. A selection was made of those sites

with 99 or more points and blades, and the percentage occurrence of rock material for both artifacts and chips is shown in table 4.

TABLE 4.—Comparison of the percentage occurrence of the rock types based upon a study of the chips versus the points and blades from the same sites

Site	Chert			Quartz			Quartzite			Greenstone			Total	
	Arti- fact	Chips	Dif- fer- ence	Arti- fact	Chips	Dif- fer- ence	Arti- fact	Chips	Dif- fer- ence	Arti- fact	Chips	Dif- fer- ence	Arti- fact	Chips
	Per- cent	Per- cent	Per- cent	Per- cent	Per- cent	Per- cent	Per- cent	Per- cent	Per- cent	Per- cent	Per- cent	Per- cent	Per- cent	Per- cent
AU-4.....	79.6	90.0	10.4	1.3	1.2	0.1	19.1	6.4	12.7	0.0	2.4	2.4	100	100
AU-5.....	76.0	94.2	18.2	7.2	3.5	3.7	16.8	2.3	14.5	.0	.0	.0	100	100
AU-36.....	75.4	86.4	11.0	4.6	6.4	1.8	20.0	6.0	14.0	.0	1.2	1.2	100	100
AU-45.....	76.5	76.5	.0	.8	16.4	15.6	22.7	7.1	15.6	.0	.0	.0	100	100
RM-4.....	82.0	80.0	2.0	3.0	15.0	12.0	15.0	4.3	10.7	.0	.7	.7	100	100
HD-4.....	83.1	85.0	1.9	5.0	3.4	1.6	11.9	11.6	.3	.0	.0	.0	100	100
AU-11.....	20.0	21.0	1.0	20.0	20.4	.4	60.0	58.6	1.4	.0	.0	.0	100	100
AU-13.....	23.7	19.6	4.1	14.3	12.1	2.2	62.0	67.0	5.0	.0	1.3	1.3	100	100
AU-24.....	10.8	4.0	6.8	16.2	17.0	.8	70.5	78.0	7.5	2.5	1.0	1.5	100	100
RM-8.....	12.4	6.5	5.9	6.1	6.0	.1	81.5	87.5	6.0	.0	.0	.0	100	100

The third column shows the difference in percentage between the artifact and chip collections. At first glance it might suggest a lack of conformity, and it is true that the chip collections tend to exaggerate materials of high percentage occurrence and minimize popularity at low percentage levels. However, of the 35 paired samples of rock materials plotted in table 4, 18 show a difference of 2.4 percent or less between the two collections, and 25 show a difference of 7.5 percent or less. This means that in 50 percent of the collections the conformity is within 2.4 percent, suggesting that there is sufficient reliability in the chip collections to make them usable for the study of rock materials. The necessity of using such collections became evident when so many sites were examined which had a small assemblage of classifiable artifacts but which produced a fairly large collection of chips. Granted, the use of chips to determine the popularity of rock materials through time and space might not be as sensitive an indicator as stone artifacts or pottery, the fact that so many sites in northwestern Virginia produced so few artifacts made it necessary to exhaust every possible bit of evidence.

One slight discrepancy appears upon careful scrutiny of table 4. Greenstone appears to be present more often in chip collections than in point and blade collections. Since greenstone was used mainly to fashion axes and celts, the table does not correctly reflect the situation. If this factor is kept in mind and the tabulation of other artifacts from the various sites is consulted in table 6 of the Appendix, greenstone is found just as often in the artifacts as in the chip collections. However, it is clear from table 4 that chert and quartzite will

undoubtedly be the most useful rock materials in this study owing to their individual popularity at certain sites.

If popularity of rock materials has temporal and spatial significance, the problem can be approached by plotting sites on a map and by seriation. The latter problem will be attacked first. By seriation of sites on a basis of increasing or declining percentages of one or the other most popular rock materials (quartzite or chert) a smooth curve of transition develops, but it is impossible to tell the top and bottom of the chart without reference to the seriation sequences already described. Therefore the relative position of sites in the adjusted ceramic and projectile-point and large-blade seriations were listed in a column from the most recent at the top to the oldest at the bottom (fig. 9). The percentages of rock materials based on chip collections, plotted as bar graphs, were then inserted into columns opposite the sites where a chip collection existed or was large enough for percentage calculations. After this, sites with adequate collections of chips but so few artifacts that they had not been placed in the seriated chipped-stone sequence now were interdigitated as they best fitted.

Beginning at the bottom of figure 9 it will be noted that 21 sites, representing the oldest horizon, have no less than 63 percent quartzite and no more than 26 percent chert. All the sites above this lowest sequence, with the exception of AU-13, AU-11, and AU-26, reveal an abrupt reversal in popularity of the two types of rock. Here, in the upper part of the chart the lowest percentage occurrence of chert is 59.4 percent and the highest of quartzite 28.8 percent. For the moment, ignoring the three sites that appear out of place and are indicated on figure 9 with a bracket around them (AU-13, AU-11, and AU-26), sites with high percentage of chert represented in the upper part of the sequence can be divided into two distinct categories: preceramic and ceramic. Sites HD-5, RB-5, HD-3, AU-10, AU-48, HD-6, HD-7, AU-47, RB-6, AU-36, AU-37, and AU-4 have no pottery and the rock material is predominantly chert. Because of the decided shift in popularity of rock materials from quartzite to chert, the terms "quartzite-using" preceramic complex and "chert-using" preceramic complex had been used. This sudden shift from one material to another in figure 9 suggests that there is possibly some factor involving areal distribution rather than one solely representing a change of popularity of material throughout time. Further suspicion of this factor is raised as a result of the position of sites AU-13, AU-11, and AU-26 in this graph of rock materials. In their present position in this sequence, they are obviously out of place, for they produce a decided disconformity in the trends of the popularity of quartzite and chert. They are the only three sites in the entire se-

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quence that do not seem to fit the rock material trends. What is the reason?

Looking back to the final seriation of projectile points and blades (fig. 5) it will be noted that AU-11 and AU-13 (AU-26 had too small a sample of only 16 artifacts to plot) are the earliest sites in the sequence with pottery before the transition to preceramic sites. The fit at this place in the sequence is not bad, but if it had not been assumed that pottery sites were always later than preceramic sites, these two sites could have actually fit just as well a few steps further down the sequence. Looking at the sequence of sites with pottery (fig. 8) originally seriated independently from the point and blade seriation, the same three sites are at the bottom of the sequence. In fact, site AU-26 with a fairly reliable pottery sample stands out as if out of place in comparison to the popularity of other pottery types owing to 60 percent occurrence of Stony Creek Pottery Series. Although the site, along with AU-13 and AU-11, fits at the bottom of the pottery sequence owing to the high percentage of Stony Creek pottery, there is obviously some gap between these sites and the others. Either more sites with this type of pottery exist in the area and were not found in the survey or some other explanation must be sought. With this situation in mind, let us return to the rock-material chart (fig. 9).

The site order on this chart is that derived by the seriation of the pottery types and the points and blades. The only sites that appear to be badly out of position in the rock-material sequence are AU-13, AU-11, and AU-26. To produce a smooth trend, these would have to be moved to the upper limit of the quartzite-producing sites, adjacent to AU-17. However, this would put these three ceramic sites in the midst of a series of nonceramic sites, with the implication that these sites had a pottery-making culture while the rest of those in the area were nonceramic.

To evaluate further the position of AU-13, AU-11, and AU-26 in the rock-material sequence, the problem of areal distribution must be considered. To investigate this factor, sites used in the seriation of rock material in the "quartzite-using" preceramic horizon were plotted on a map (fig. 10) as crosses, the sites in the preceramic "chert-using" horizon were plotted as circles, the three sites with a high percentage of quartzite in the ceramic period (AU-13, AU-11, and AU-26) were plotted as triangles, and the other ceramic horizon sites were plotted as squares.

This arrangement demonstrated definitely that an areal factor is involved. All preceramic "quartzite-using" sites are located in the valleys of the two South Rivers and extend up the South Fork of the Shenandoah River. The ceramic sites with high percentages of

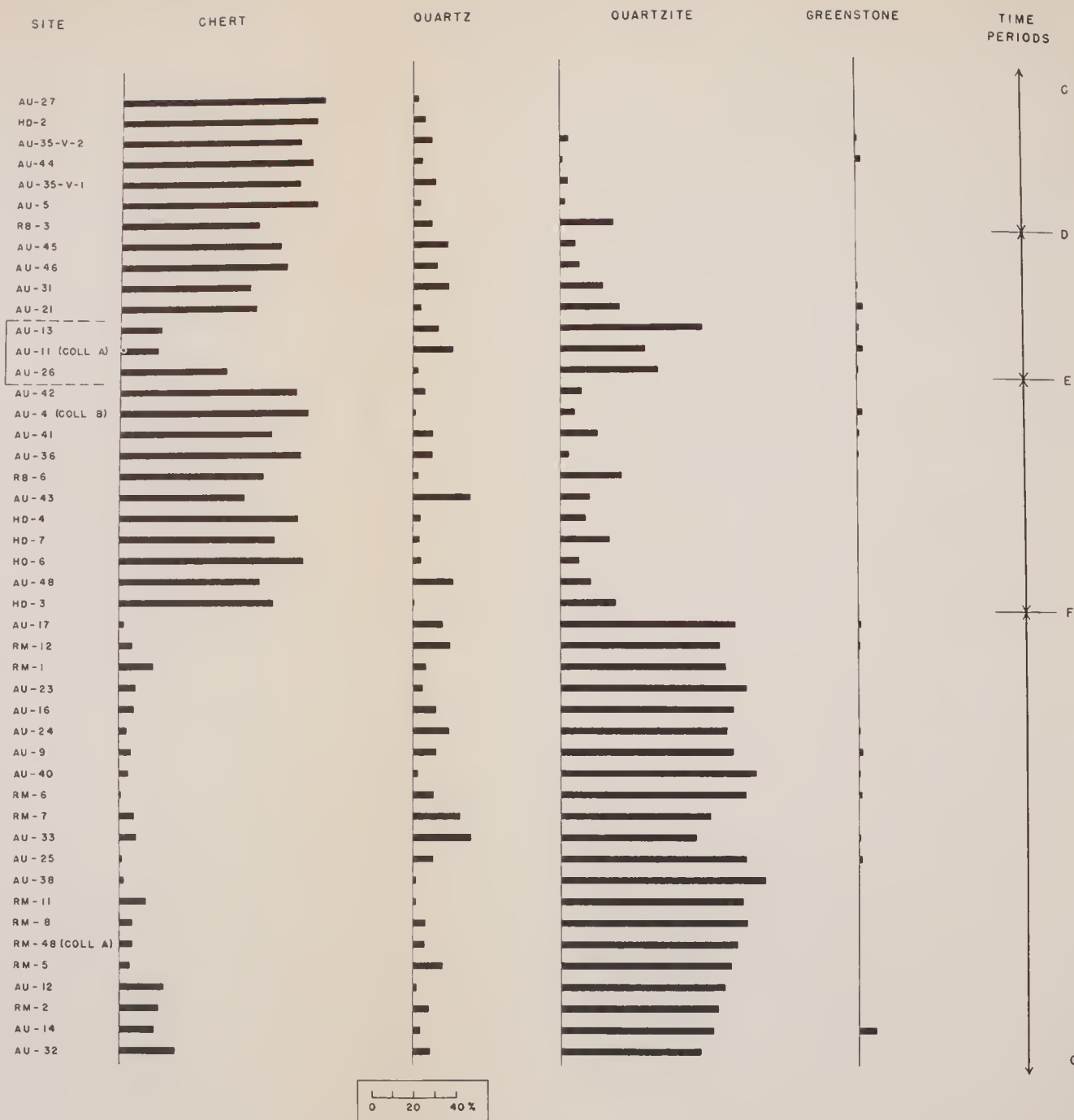


FIGURE 9.—A temporal sequence based on rock types.

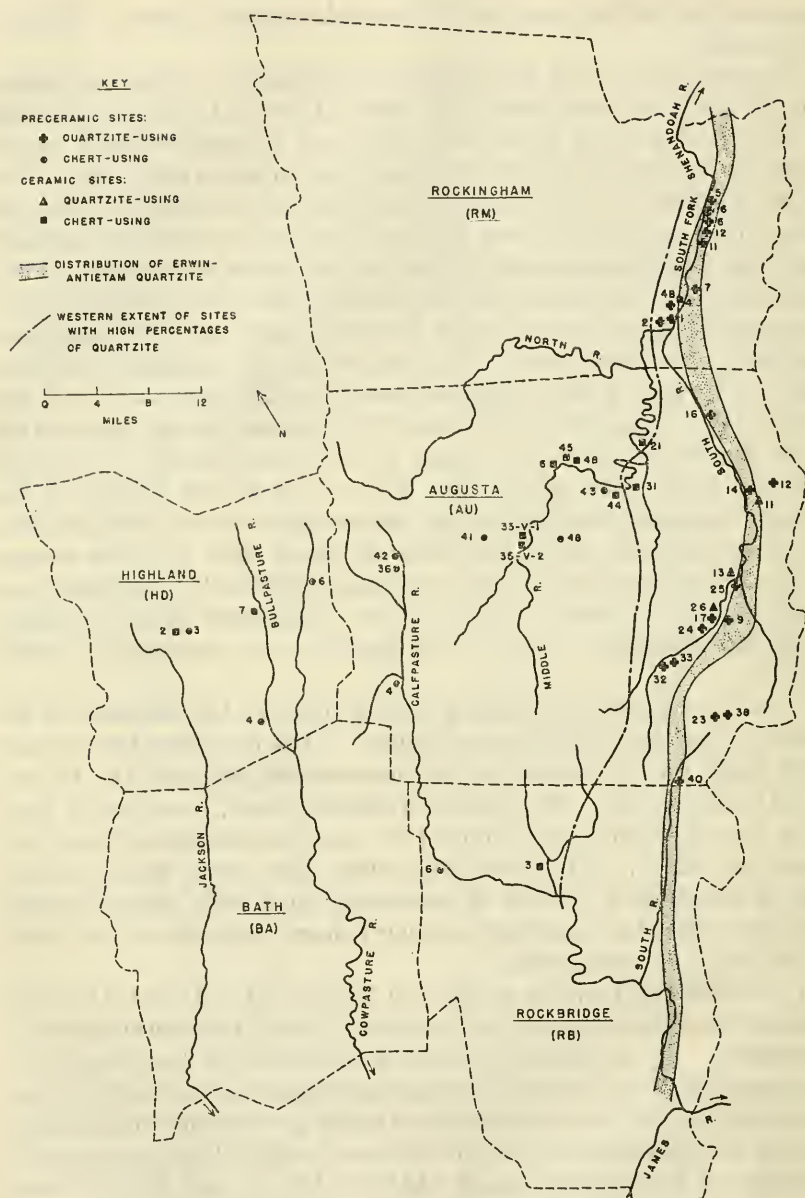


FIGURE 10.—Distribution of “quartzite-using” and “chert-using” sites of the pre-ceramic and ceramic horizon.

quartzite are found only along the South River (into South Fork of the Shenandoah). As has been stated in the description of the survey area, quartzite is readily available locally.¹ All the ceramic or pre-ceramic sites, except one, with a high percentage of chert are found west of this South Rivers District. In this western area chert is readily available as inclusions or strata in the limestone.

Further evidence of the influence exerted by availability of raw material is brought out by an examination of the distribution of the ceramic complexes. As shown by figures 11 and 12, pottery of the Stony Creek Series and of the Radford Series moved into this part of Virginia from opposite directions. The diffusion of ceramic types, however, was not accompanied by a diffusion of the rock preference associated with these pottery types in the place of immediate origin. This is most clearly shown in the case of the Stony Creek Series, which moved in from the east, a predominantly quartzite-using area. When this pottery diffused westward beyond the South Rivers District, the preference for quartzite for blades and projectile points did not move with it. Instead, the people in this western region continued to make their projectile points of chert.

The conclusion that availability of the raw material was the primary factor in explaining the geographical distribution of two preceramic cultures distinguished in this part of Virginia does not mean that no cultural distinction exists. The fact that there are two cultures rather than one is shown by the seriation. If there was a single culture, one would expect the seriated sequence in the two areas to be comparable, so that interdigitation would be possible. However, the lack of overlap makes it clear that two separate cultures are represented.

In concluding this discussion of the analysis of chip materials it is mainly pertinent to point out that certain conclusions, discrepancies, and interpretations (explained fully in the section on relationship of sequences of the report, pp. 80-88) are added or strengthened as a result of this approach. Chip studies permitted more sites to be utilized in the survey than would otherwise have been possible because many sites produced only a few artifacts but a large amount of chips, thus extending the area and accuracy of the study. As a result of the fact that choice of rock materials shows temporal, areal, and cultural differences, several discrepancies in the sequences derived from seriation of points and blades were revealed. As previously pointed out

¹ From the geologic map of the Appalachian Valley in Virginia (Butts, 1933) the outline of the natural occurrence of quartzite was transferred to the map (fig. 10) showing the sites according to their preferences for rock materials. This area is shown by stippling and extends along the South Fork of the Shenandoah River and the two South Rivers. For purposes of this report this area has always been referred to as the "South Rivers District." A heavy dot-and-dash line shows the western extent of all sites known to have high percentages of quartzite.

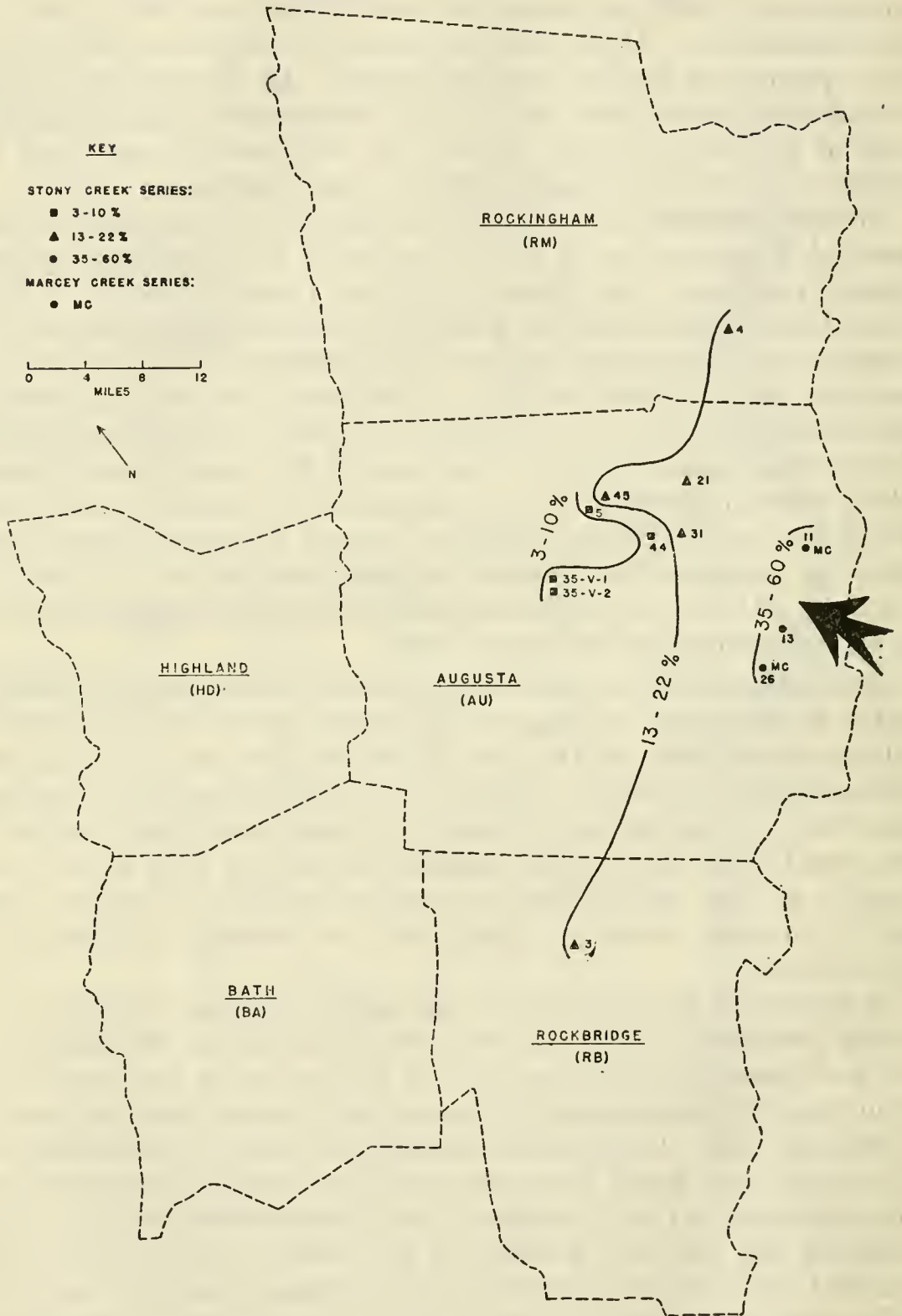


FIGURE 11.—Direction of movement of the Stony Creek Pottery Series from the Central and North Central Ceramic Area into northwest Virginia.



FIGURE 12.—Direction of movement of the Radford Pottery Series into northwest Virginia.

in detail, the interpretation of the position and cultural meaning of sites AU-11, AU-13, and AU-26 would never have been demonstrated without this study. However, it must be understood that rock materials alone are not sufficient; these collections must be accompanied by adequate observation of the site and consideration of all the data. But they are unusually valuable in assessing the preceramic horizon to which a site with an inadequate collection of artifacts may be assigned. In the survey area, two preceramic horizons, exclusive of a possible Folsomlike horizon, are definable, each characterized by a marked preference for rock materials, one quartzite and the other chert. The "quartzite-using" preceramic horizon is confined to a set of sites in a narrow band of land at the western foot of the Blue Ridge Mountains described in this study as the "South Rivers District." The other preceramic horizon shows a preference for chert and is distributed widely west of the South Rivers District in Augusta, Highland, Bath, and Rockbridge Counties. In addition, the two ceramic horizons, one with a preference for quartzite and a high percentage of Stony Creek Series pottery and the other preferring chert and having a majority of Radford Series pottery, have a similar distribution as the two preceramic cultures mentioned above.

These distinctions in rock preference, when combined with the pottery-type analysis, permit a reconstruction of cultural movements into this part of Virginia and their degree of penetration to be discussed in more detailed and more complete terms than would have been possible using pottery or arrowpoint types alone (pp. 43, 58). This makes it seem likely that if comparable information were available from the surrounding area, more specific statements about the movements and settlement of aboriginal groups in the entire region could be made. It is hoped that this attempt to demonstrate their usefulness will stimulate others to undertake the collecting and analysis of chips when they visit archeological sites.

HABITATION PATTERNS

The absolute time span represented by the total number of sites in this study is not known with any certainty. However, some of the changes in the courses of the swift streams near sites give a clue to a considerable lapse of years and should correlate with the habitation patterns of each cultural group. These changes will be immediately apparent to a trained geologist, and even to an untrained observer the formation of terraces between a site and the nearby present-day river bed has considerable suggestive value of change through time. When a site of the ceramic period, such as RM-4, is located on the bank of a river, and 35 yards inland and 8 to 10 feet higher there is a preceramic

"quartzite-using" station, RM-4B, with gross evidence of erosion between the two, the impression of change and age is unavoidable.

For years, local collectors have made several observations which, though impressionistic, are indicative of these geographical and cultural differences. In the valley of the Calfpasture River it had been noted that artifacts were not generally found on the banks of the river but on terraces at some distance from it. In the valley of the South River (into James) the general impression was that "flint" (chert) artifacts were found near the river and those of quartzite were found farther away. Indeed, during the survey, the pattern of site locations began to develop and it was of considerable interest to predict, with a certain amount of accuracy, the cultural horizon expected if given the geographical position of an occupational area. For example, while at AU-44, a site with a pottery tradition on Middle River, a local resident reported the presence of "arrowheads" on a hill south of the site. Conscious note was made of the prediction that it would probably be a site of the preceramic horizon. On investigation the area was in sod, but 23 quartzite, 5 quartz and 8 chert chips, 1 greenstone Unclassified Blade, and 1 quartzite Unclassified Point were discovered. There was no pottery. The material unquestionably belongs to a group who occupied the site during the preceramic "quartzite-using" horizon. At AU-21, an early ceramic site on Middle River, a 10-foot-high terrace parallels the river 50 yards from the riverbank where the site is confined. The bank and plateau of this terrace had been eroded. Before investigating the area it was predicted that, if any artifacts were found, they would belong to a preceramic horizon. In the eroded gullies quartzite chips, which are most common to one of the preceramic horizons, were found, but no artifacts.

These observations opened the problem of habitation patterns. Would it be possible to determine anything regarding cultural patterns, or age of sites, by the data which had been assembled? Undoubtedly many variable factors are present, and it is believed that no single site can be used as evidence for any particular hypothesis. However, it might be possible to use groups of sites and their temporal placement to minimize or accentuate these variables so they would form meaningful patterns.

For this discussion the sites will be used with the temporal designations that developed as a result of seriations. These six arbitrary divisions are briefly summarized: "A," the historic period; "B-C," the period in which the New River Pottery Series blossomed in popularity and the Radford Pottery Series declined; "C-D," the increase in popularity of the Radford Pottery Series; "D-E," the beginning of the

ceramic horizon in this part of Virginia with the occurrence of the Albemarle Pottery Series; "E-F," the "chert-using" horizon of the preceramic period; "F-G," the "quartzite-using" horizon of the preceramic period.

With these time divisions as a guide, 61 sites, for which the data were available on distance and height from a stream, and from which an artifact, pottery, or chip sample had been classified, were plotted in table 5 with two vectors: horizontal—distance from the banks of present-day streams; and vertical—height above water level. The temporal placement of each site has been given according to the alphabetical time periods mentioned above. The distances from the stream bank are given in blocks of 30 feet with all sites beyond 90 feet plotted without further breakdown. The height of each site above water level is given in 10-foot units with sites above 30 feet plotted without further breakdown. For easy reference the blocks of table 5 were lettered horizontally and numbered vertically. To illustrate, AU-1, between 60 and 90 feet from Back Creek and between 10 and 20 feet above it, will be found in block C-2. Reference to table 5 throughout the following discussion is essential.

From the plotting of the sites, it is immediately apparent that the once-thought *absolute* correlation of preceramic sites on higher land some distance from the present-day streams, with all the ceramic sites on the terraces and bottom lands adjoining the stream banks, does not exist. In other words, if this impression had proved a fact, all the preceramic sites (i. e., sites with E-F or F-G time periods) would have plotted in the blocks most distant from the stream and in the greatest height above the stream, with all the ceramic-period sites falling in nearest block (i. e., block A-1). Inspection of table 5 indicates that such is by no means the case. However, there are some generalizations from the table that may shed light on either the age or cultural traits of certain groups of sites.

Since in the Eastern United States generally it has been agreed that pottery-using cultures are correlated with the introduction of sedentary village life and the development of extensive agriculture, let us first examine the location of all sites falling into any of the ceramic horizons. These sites are designated by the time periods A-B, B-C, C-D, D-E. By inspection of table 5 it is noted that sites with the designations of B-C seem to be scattered from blocks A-1 to D-4, that is, from the area closest to the stream in both distance and height, to the areas most distant in both dimensions. But looking up the descriptions of these particular sites gives us a better clue than the first inspection of table 5 would indicate. Height and distance from the stream unfortunately were not available for all the sites, so the absence of many late sites on the chart is noticeable.

TABLE 5.—Schematic presentation of the geographical location and temporal position of sites with reference to river terraces

30	Time period F-G RB-4	Time period B-C AU-27 Time period D-E AU-31, AU-46 Time period F-G AU-25	Time period B-C Block B-4	Time period B-C HD-2 RB-7 Time period E-F HD-6 AU-48
20	Block A-4	Block B-3	Block C-4	Block D-4
10	Block A-3	Block B-2	Block C-3	Block D-3
0	Time period F-G RM-1, RM-5 RM-6, RM-8 RM-12	Time period E-F AU-43 HD-7 Time period F-G AU-24	Time period F-G AU-1	Time period E-F HD-4, RB-6 Time period F-G RM-2, RM-4B RM-7, RM-11
	Block A-2	Block B-1	Block C-2	Block D-2
	Time period A-B AU-2 Time period B-C BA-1 Time period C-D AU-5, AU-35-V-1 AU-35-V-2, AU-44 RM-4, RB-3	Time period E-F AU-43 HD-7 Time period F-G AU-24	Time period E-F AU-10 Time period F-G AU-14 AU-17 AU-23	Time period B-C HD-9 Time period E-F AU-4, AU-29 AU-36, AU-37 AU-42 Time period F-G AU-32
	Block A-1	Block B-1	Block C-1	Block D-1

90

60

30

Distance in feet from stream to site

Those with B-C time periods, plotting with great distances from the streams, fall into two major categories—rock shelters and burial mounds. The location of a rock shelter has nothing to do with streams but rather the availability of the shelter; and burial mounds have no direct correlation with the presence or absence of satisfactory conditions for the agricultural fields or the habitation sites. Thus the locations of sites BA-1, AU-27, RB-7, and HD-9 in table 5 cannot be of any significance to the problem at hand.

Turning to the sites of time period D-E, or those at the beginning of the ceramic sequence in this part of Virginia, they all appear in block A-1, or less than 30 feet from a stream and on a bank not over 10 feet above the stream bed with the exception of two sites, AU-31 and AU-46. With reference to the exceptions, AU-31 and AU-46 are on bluffs overlooking the river. Since these groupings are the sites with the earliest history of agriculture in this part of Virginia, it is not unusual to find them coming close to the river's edge and seeking out the good bottomlands and low terraces for their crops. In other words, the position of the sites definitely correlates with what one would expect of an agricultural group, and this type of plotting helps substantiate the general validity of the seriation and site groupings into ceramic and preceramic time periods based upon other data. The cultural pattern of agriculture caused these peoples to seek a geographic situation most commensurate with their needs. Therefore, one would expect the majority of the sites of this cultural horizon to fall into a specific geographical distribution most beneficial to successful aboriginal agriculture; i. e., in the low bottomlands where the soil is richer and where the land holds the moisture longer.

Turning to the "chert-using" preceramic sites or those found in time period E-F and the "quartzite-using" preceramic sites restricted to time period F-G, we note a more scattered arrangement over table 5. Either this means these peoples were not forced by their pattern of life to live in a specific geographic situation as were the agriculturists, or the terrain has changed so much since their occupation that one can postulate a considerable age for some of the sites by a study of terraces and stream erosion. Unfortunately such geomorphological studies have not been made in Virginia although recently certain members of the United States Geological Survey were examining the possibility of dating some Middle River terraces from archeological information.

Further examination of table 5 indicates that four sites (25.0 percent) in the "chert-using" preceramic horizon (time period E-F) are located in block A-1 as opposed to 12 (75.0 percent) sites of the same period located more remotely from the stream banks either in distance

or height. Similar circumstances occur in the "quartzite-using" preceramic horizon (time period F-G) with seven (25.7 percent) in block A-1 and 19 (74.3 percent) more removed, either in height above water level or at greater distances. Checking the site numbers of each one occurring outside block A-1 of table 5 and referring to the site descriptions and notes, it is extremely significant that in each case there is some comment about the extensive erosion, the fact that the stream has changed its course or cut more deeply into the terraces. However, erosion alone is by no means the explanation. If this were the case, then all the sites seriating in the bottom of the time sequence, i. e., in the lowest part of time period F-G, should be the farthest removed in distance and/or altitude from the present-day streams. This is not the case. In fact just as many "chert-using" sites as "quartzite-using" sites of the preceramic horizon are found on high terraces even though the seriated sequences suggest that the "quartzite-using" stations are the earliest in the sequence. The weight of evidence, therefore, suggests that, although erosion might be a factor which will some day prove significant in working out relative time of an occupation of certain aboriginal sites in Virginia, the geomorphology of the region must be more thoroughly analyzed by competent geologists than it has been up to the present time. Under these circumstances the location of various preceramic sites suggests that their type of subsistence pattern did not regulate the location of their habitations as strongly as when the Indians became agriculturists; hence the early habitation sites merely needed to be near a good hunting ground, or a point offering some satisfactory camping conditions and an available water supply.

The results of this experimental study on aboriginal habitation patterns in northwestern Virginia have not been overwhelmingly successful, yet they have not been so unfruitful as to suggest total abandonment of such an approach for future students of Virginia archeology. Perhaps if the data were always carefully observed for each site in the State, more fundamental conclusions could be drawn than is now possible with the limited data at hand.

In summary, sites of the agricultural period tend to be restricted to bottomlands and lowest terraces nearest present-day courses of streams. Preceramic sites tend to be farther away and higher from streams, suggesting a possible time factor, with their present positions resulting from erosion, but also apparently suggesting the lack of any controlling factor in their cultural pattern which would restrict their villages to any particular location, except from the standpoint of a good water supply, defense, hunting and fishing grounds, and water routes.

RELATIONSHIP OF THE SEQUENCES OF NORTHWEST VIRGINIA TO ARCHEOLOGY OF EASTERN UNITED STATES

In summarizing the total results of the individual and combined sequences obtained by this study, it is necessary to compare them with other scientific studies in Virginia and surrounding areas. Although the literature is quite extensive for eastern archeology as a whole, the number of reports dealing with archeological materials in Virginia or adjacent regions which seemed pertinent to this detailed study is actually very limited. It must be emphasized that conclusions drawn from the various approaches herein attempted are not necessarily applicable to other regions although it is felt that the methodology might offer fruitful approaches to research problems of similar situations in eastern North America. Indeed, it seems almost outside of the scope of this paper to do anything more than to show how this intense study of one small area fits into Virginia archeology. Certainly the particular position of one type of point, sherd, or rock material here does not argue for an identical position in any other part of the Eastern United States. Until further work along similar lines is carried out in Virginia and the surrounding States it will be impossible to check the validity of some of the conclusions.

In the preceding section and on various charts the sequences have been arbitrarily broken and marked with letters of the alphabet for convenience in designating time periods. Up to this section the various reasons for the particular points of demarcation have not been clearly delineated. This will be accomplished in subsequent paragraphs but it should be understood that when time periods D-E or B-C, or any other period set off by arbitrary time markers A through G is used, these markers are not to be considered the main point of the discussion. One should, instead, view these designations as mere tools to show various aspects in the development of aboriginal cultures in northwest Virginia.

The following discussion is arranged by the various divisions or markers of time periods, beginning with the earliest determined in the survey area and coming upward in time toward the historic.

Time Marker G (beginning of Early Archaic).—This marker has been ordered at the earliest occupation of the area by preceramic cultures as found by this study. It is definitely not to be construed as meaning that this is the point of earliest evidence of man in northwest Virginia. It is firmly believed that one more subdivision remains to be made and that will depend upon how much evidence of Paleo-Indian materials turns up in the future. To date, two eastern-type Folsom points have been reported from the vicinity of RM-1 (Mc-

Cary, 1949, points No. 156, 157). Other such points have been reported northward in the drainage of the South Fork of the Shenandoah River. Therefore, there is reasonable expectation that someday an eastern version of the Paleo-Indian horizon will be clearly defined for this area.

Time Marker F (Early Archaic).—This point on the time scale has been chosen to mark the transition between two clearly defined pre-ceramic horizons. The earlier, called "quartzite-using," extends over the period located between Time Markers G–F and was so designated because of the decided preference for quartzite (over 63 percent) as the rock material for chipped-stone artifacts. In northwest Virginia this horizon is uniquely limited to a narrow band of land at the western foot of the Blue Ridge Mountains along two South Rivers and the South Fork of the Shenandoah River.

Inspection of the projectile-point and blade-seriated sequence (figs. 4 and 5) indicates a preference for large blades in this period. There is a gradual decline in their popularity from the lowest part of this section of the sequence to Time Marker F, and, at the same time, a slight increase in popularity of projectile points occurs. Triangular points of any type are not typical of this horizon. Two projectile point forms, Notched Stemmed Type I and Side-notched Type M, show an increase in percentage occurrence from Time Markers G to F. At the same time these two forms increase (but never appear in large percentages, usually only 4 to 14 percent), large blade Type Q (Large Parallel-sided Stemmed) is increasing from 1 to 13 percent and blade Type U (Large Rounded Base) is decreasing from 28.7 to 5.9 percent.

From the study of the miscellaneous stone artifacts, the crude ax, the hafted end scraper, and the end scraper are more common in this part of the sequence than at later times.

Three-quarters of the sites of this time period were found either at remote distances or on high elevations from present courses of streams. This might be the result of their earlier age, with the stream changing its course or eroding more deeply, but the controlling factor could also be the lack of a need for settlement in the bottomlands since these people were not practicing agriculture.

A study of the literature suggests that sites that fall between Time Markers G–F in this study are manifestations of the Early Archaic as defined by Griffin (1952, pp. 354–355) even though it is realized that many of the cultural traits in Griffin's classification are not available for comparison.

Time Marker E (transition point between Late Archaic and Early Woodland).—It is traditional in the literature on North American archeology to designate the point between the preceramic and ceramic

horizons, thus Time Marker E has been so positioned. Throughout the study it has been noted, however, that the complete preceramic horizon has two distinct traditions. The seriation studies indicated that sites showing a high popularity of chert belonged in the more recent (upper) part of the preceramic zone. These sites fall between Time Markers E and F in the seriated sequences (fig. 9). In this period there are distinct changes in the projectile-point types and percentages of occurrence. Notched Stemmed Type I, Side-notched Type M, and Large Parallel-sided Stemmed Type Q decrease from 14.8 to 5.6 percent, 13.8 to 5.6 percent, and 13.0 to 3.7 percent, respectively. At the same time Triangular Type C increases in popularity from 2 to 11 percent (fig. 5).

The geographic distribution of sites falling between Time Markers F and E is west of the so-called "South Rivers District," and therefore west of the Early Archaic sites.

Since Triangular Point Type C appears for the first time in any consistent large percentages, the sites with this type of point were plotted on a map. The distribution is interesting for, in general, those sites with the lowest percentages are distributed more southwesterly than sites with higher percentages. Unfortunately for this type of plotting, the number of sites was not sufficiently large to make definite trends on the map, but it was suggestive that Triangular Type C first came from outside the survey area into northwestern Virginia from the southwest.

It is extremely difficult to relate this horizon to another in Virginia, or nearby regions for that matter, owing to the scant amount of data from areas immediately outside the limits of the survey area. In Albemarle County where a single preceramic horizon has been recognized (Holland, 1949), quartz is the preferred rock material, and triangular forms never have a greater popularity than 5 percent; also other forms, such as projectile-point Types J and K, are more popular than they are in this time period of the survey area. Little purpose is served by comparisons with the published accounts of preceramic horizons of the Savannah River Focus in North Carolina (Coe, 1952, p. 305), the Red Valley Component in New Jersey (Cross, 1941, p. 168), or the Poplar Island Component in Pennsylvania (Witthoft, 1947, pp. 123-124), since they are not described in the same manner as this study and, unfortunately, the data is not convertible for such comparison. However, it is the writer's impression after careful study of these reports that little direct relationship exists between the preceramic "chert-using" horizon of Time Period F-E and the preceramic horizon in the aforementioned reports.

Time Marker D (beginning of Middle Woodland).—Sites of the survey area within the pottery period start the pottery sequence at

Time Marker E. From this point upward in time to the place designated as Time Marker D the pottery is more typical of the ceramic traditions of the Central and North Central Ceramic Area of Virginia than those types which later typify the Allegheny Ceramic Area (cf. Evans, 1955, p. 103). These trends, in both the survey area and in the Central and North Central Ceramic Area, may be summarized as follows: The earliest sites have a high percentage of the Stony Creek Pottery Series, moderate percentages of the Albemarle Pottery Series, and traces of the Marcey Creek Pottery Series; throughout the passage of time (upward in the sequence) the Stony Creek Pottery Series declines in frequency while the Albemarle Pottery Series increases and there is an early loss of the Marcey Creek Pottery Series (fig. 8).

All the sites in the survey area with sherds of Stony Creek or Marcey Creek Pottery Series were plotted on a map (fig. 11) according to their percentage occurrence in four categories: Sites with 3-10 percent, 13-22 percent, and 35-60 percent pottery of the Stony Creek Series, and the presence or absence of sherds of the Marcey Creek Pottery Series, regardless of amount. The various points of breakdown in the percentage occurrences are purely arbitrary but represent the most distinct breaks, e. g., no sites existed with a percentage frequency of sherds of the Stony Creek Pottery Series from 22-35 percent, hence this point was considered as a breaking point of two categories. Although a very small number of sites are involved, the results are nevertheless significant. Sites with sherds of the Marcey Creek Pottery Series are found only along the western foot of the Blue Ridge Mountains, and in the same locale are sites with the highest percentages (35-50 percent) of sherds of the Stony Creek Pottery Series. As one moves westward, away from the Blue Ridge Mountains, Marcey Creek Pottery disappears entirely and the frequency of Stony Creek Pottery falls so that the most distant sites have only 3-10 percent (fig. 11). This distribution suggests that these pottery types, which are most typical of the Central and North Central Ceramic Area of Virginia, enter the survey area as far as the central part of the Middle River valley with direction of movement decidedly from the southeast and east. No influence can be demonstrated to have come from the north or west in Time Period E-D.

At the same time that the pottery has shown such distinct trends and directions of movement, the chipped-stone artifacts also show marked trends. With the passage of time triangular points become more popular while various stemmed varieties continue to decline in frequency, i. e., Medium Triangular Type B increases from 0.6 percent (AU-13) to 7.1 percent (AU-5) and Triangular Type C from 8.7 percent (AU-13) to 19.5 percent (AU-5). Of a total of five sites in

the entire study with Pentagonal Point Type E, four of them are above Time Marker E. The same relative position of Type E, as well as the trends of popularity of the various point and blade types for the survey area, also occurred in the study of sites in Virginia as a whole (see Holland, 1955, p. 175 and fig. 23).

With the introduction of pottery, other artifact types changed: Drills, celt forms, and pipes became more frequent; steatite bowls were popular on the earliest sites in the ceramic sequence; scrapers and crude axes declined in frequency.

The majority of the sites were near the streams in the bottomlands instead of more distant from the water, a point undoubtedly associated with the need for location of habitations in areas more favorable to agriculture.

Although it is suggested that sites AU-11, AU-13, and AU-26 have characteristics of the Early Woodland Period and are found at the earlier part of the Time Period E-D, the real problem is the point of demarcation between the Early Woodland and Middle Woodland Periods. Evans (1955, chart 1) delineates the Middle Woodland as the period in the Central and North Central Ceramic Area in which there is an increase in the Albemarle Pottery Series and a decline in the Stony Creek Pottery Series. Although this process is taking place at the three aforementioned sites, it seems more likely that Middle Woodland in the survey area begins with the steadily increasing popularity of the Radford Pottery Series, and either Evans' designation is too generalized a statement and slightly in error, or there is a local factor to be considered which would make the period designations slightly different for each area. It is felt that the ceramic sites in the sequence for the survey area nearest the Time Marker E would be Early Woodland and that Time Marker D is about the beginning of the Middle Woodland Period.

Time Marker C (Middle-Late Woodland).—The point in the seriated sequences of sites where the Radford Pottery Series reached its maximum popularity was arbitrarily designated as Time Marker C, and means that the Time Period D-C probably represents Middle-Late Woodland Period development. As the sites with pottery of the Stony Creek and Albemarle Pottery Series gave way to sites with the increasing popularity of the limestone-tempered Radford Pottery Series, it was obvious that this reflects a new cultural movement into northwestern Virginia. To see if it might be possible to discover the direction of influence carrying the Radford Pottery Series tradition of limestone-tempered wares, all those sites with such pottery were plotted on a map (fig. 12) and given a symbol according

to whether they had 1-10 percent, 27-40 percent, or 95-100 percent Radford Pottery Series as derived from the percentage calculations found in the Appendix, table 7. Inspection of figure 12 indicates clearly that the movement is from the southwest to the northeast with those sites having the lowest percentage in the most extreme northeast position, whereas those sites with the highest percentage are to the southwest. This immediately suggests that the cultural influence, whether by diffusion or from the actual movements of a group, came from this direction. These data rather interestingly confirm Evans' (1955, pp. 127-129) comments and propositions that the Radford Pottery Series in high percentage occurrences antedates the New River Series and the movement of both these pottery traditions into the Allegheny region of Virginia is probably from the southwest, in West Virginia or adjacent regions.

Only mounds RB-7 (Battle or Bell Mound No. 1) and HD-9 (Clover Creek Mound) can be related to this time horizon on the basis of pottery content. The burial pattern of a flexed position with the bodies covered by stones, the occurrence of similar grave goods, the presence of a mound built on a broad, level bottomland near a stream, are quite similar in the various mounds of AU-35-M, HD-9, RB-7, and RB-2, suggesting that they all must belong to the same cultural complex. The published data or museum collections do not permit accurate comparison, but all the mounds excavated by Fowke (1894) in Virginia do not fall necessarily into this time period of the mounds in northwest Virginia.

Time Marker B (Protohistoric).—This point marks the period in the sequence where the New River Pottery Series reaches its maximum popularity. Although this is not clearly defined by the sites in the area, Evans' study for the whole of Virginia defines the pottery development for the Allegheny Area in such a way there is little doubt that the change from Radford Pottery to the New River Pottery, with its subsequent increase in popularity, occurs at a time somewhere around the extreme Late Woodland or Protohistoric. The single site, AU-2, having 64 percent New River Series and 2 percent Radford Series with 34 percent unclassified sand-tempered pottery of a type definitely not of the Stony Creek Pottery Series, draws attention to the Southern Division of the Allegheny Ceramic Area where the transition through time from the limestone-tempered Radford Pottery Series to the shell-tempered New River Pottery Series has been fully worked out (Evans, 1955, pp. 103-108). The pottery of AU-2 may also be compared to the Keyser Farm material where, of the body sherds classified according to temper, 78 percent

of the sherds were shell tempered (Keyser Cord Marked; considered a subtype of the New River Pottery Series by Evans), 3.9 percent limestone tempered (Page Cord Marked; considered to be a subtype of the Radford Pottery Series by Evans) and 18.1 percent were "grit" tempered (Potomac Creek). A detailed discussion of this subject can be found in the original sources (Manson, MacCord, and Griffin, 1944, pp. 402-407; Evans, 1955, pp. 60, 67). The relative percentages of temper in the three wares from each site are sufficiently close to make it believable that AU-2 and the Keyser Farm Site are closely related in time. Further, Schmitt (1952, p. 62) relates the Keyser Farm Site with various foci, such as Gala, Potomac Creek, etc., to the Late Woodland Period. Griffin (op. cit., p. 413) dates the site between 1550 and 1650, and Evans (op. cit., p. 145) sees a high percentage of New River Series Pottery belonging to a Woodland-Fort Ancient mixture in the Late Woodland Period in Virginia. On the basis of these conclusions without contradictory evidence from the current study, it is felt that Time Marker B designates the Proto-historic horizon.

Time Marker A (Historic).—The historic era begins in Virginia with the English colonists in the tidewater area in 1607 even though some sources report a Spanish Mission was thought to have been established earlier on the Rappahannock River. To date, there has been no proof of this non-English settlement in Virginia. In the Shenandoah Valley the exact date of the introduction of European trade goods has not as yet been established archeologically. In nearby West Virginia, recently, MacCord (1952) has given convincing evidence of Susquehannock occupation between A. D. 1630 and 1677 at the Herriot Site on the south branch of the Potomac in Hampshire County, W. Va. The major pottery types from this site have been related to the Susquehannock during the Historic period by Witthoft (1947, pp. 249-253) and the minority pottery type resembles Keyser Cord Marked from the Keyser Farm Site (Manson, MacCord, and Griffin, 1944, pp. 402-405).

Unfortunately, no sites in the survey area had any sort of trade goods that could be dated historically, so the upper part of the sequence must be left partially suspended and without a specific date of any sort. Based upon the data of this study we must assume that either the Indians were not living in the area covered by this survey during historic times, or for some reason the survey techniques failed to uncover late sites. With reference to the general picture of aboriginal Virginia, the first postulate does not seem likely even though the region might have been so sparsely settled that no large

deposits were left. This part of the sequence is therefore left for future study to verify.

An examination of this chronological sequence in geographical terms reveals a peculiar situation: the "quartzite-using" and "chert-using" preceramic sites have nonoverlapping distributions both in time and in space. The number of sites representing each area is sufficiently large that sampling error does not seem a likely explanation, which leads to the implication that the area producing "quartzite-using" sites was uninhabited in "chert-using" times, and vice versa. Since there are no natural barriers or other geographical reasons for believing this to be true, it is reasonable to assume that both areas were occupied at the same time and that the two cultures are in large part contemporary in the area. If this is the case, it would seem to invalidate seriation as a method of determining relative age of sites and cultures. Seriation has been shown to give reliable results so often, however, that some particular situation existing in the area under study must be sought to reconcile these discrepancies.

One explanation that presents itself is that the archaic projectile-point forms that place the "quartzite-using" cultures early in the sequence may represent a cultural lag which allowed these types to be retained after they had been superseded in other parts of the Eastern United States. The evidence concerning the origin of the two preceramic cultures suggests that this is a reasonable interpretation. Since the "chert-using" ceramic culture can be shown to have moved in from the west, it is probable that the "chert-using" preceramic groups came from the same direction. Likewise, the fact that the "quartzite-using" ceramic culture has affiliations with the east suggests that the same may be true of the "quartzite-using" preceramic horizon. Evans (1955, pp. 128-129) has shown that whereas a number of relationships between the Allegheny Area of Virginia and West Virginia, Kentucky, Ohio, and Pennsylvania can be discerned, there were fewer influences on the part of the State lying east of the Alleghenies, and these were primarily from the north and south.

The relative isolation of eastern Virginia might have allowed the retention of older projectile-point forms while the Allegheny Area was being kept up to date by contacts with more active centers of cultural innovation to the west.

Further evidence in support of general contemporaneity of these two preceramic cultures comes from the analysis of geographical location. When the sites were tabulated according to distance from the river, it was found that about the same number of "chert-using" as "quartzite-using" preceramic sites were distant from the present water

channels and about the same number of both were close. This suggested that there was no appreciable difference in the antiquity of the two cultures (pp. 78-79).

If this is a correct analysis of the problem, it provides additional justification for the approach outlined in this paper. If the projectile-point seriation had not been combined with rock-material analysis and geographical distribution, the interesting suggestion that two typologically different groups were contemporaneous in this part of Virginia would have been overlooked. The possibility that this may be so provides leads for further research in the adjacent regions, in addition to showing with reasonable certainty an example of cultural lag on the archeological level.

This study of 82 sites in a restricted area of northwest Virginia shows a continuous typological sequence of the region from Early Archaic to Protohistoric times. If the analysis had been undertaken with only one group of artifact types, such as pottery or projectile points or blades, or axes, etc., the broad scope of interpretation achieved for northwest Virginia could not have been made. It was discovered in the early days of the survey that varying conditions for collecting limited the types and amounts of artifact materials that could be obtained from many of the sites. Therefore, the use of chip materials was attempted. This heretofore untried technique in Eastern archeology proved extremely profitable and not only made it possible to utilize many sites otherwise unusable because of a lack of sufficient specimens, but permitted the correlation of rock materials from chips with those of the projectile points and large blades. Certain interesting conclusions relating to both the materials available and the importance of culture as a determining factor in the choice of rock material resulted from this analysis. If future work in Virginia, as well as nearby areas, would incorporate a similar analysis of rock materials and chip collections, undoubtedly results of greater significance could be obtained than is now possible with only a single such study of this type.

Another experimental approach was the analysis of the physical position of the sites as related to local geographical features. This problem needs much further exploration in other areas in Virginia or nearby States before conclusions can be stated positively. The correlation of the sites of ceramic-using cultures with bottomlands and those of nonceramic-using cultures with terraces more distant from the stream may be explained by cultural determinants, or by a possible

factor of geological age and stream erosion. This approach emphasizes the need for cooperation between the geologist and archeologist in the study of aboriginal occupation of the Appalachian Valley of Virginia.

TABLE 6.—Occurrence, by sites, of projectile-point and blade types, rock material, chips, and other artifacts—Continued

Projectile-point and blade types, chips, other artifacts, and potsherd	AU-11					AU-12					AU-13					AU-14					AU-15															
	Chert	Quartz	Quartzite	Greenstone	Total	Percentage	Chert	Quartz	Quartzite	Greenstone	Total	Percentage	Chert	Quartz	Quartzite	Greenstone	Total	Percentage	Chert	Quartz	Quartzite	Greenstone	Total	Percentage	Chert	Quartz	Quartzite	Greenstone	Total	Percentage						
Projectile-point types:																																				
A	1	2	1	1	4	1.9	2				2	13.3	1					1	0.6																	
B	8	12	11		31	14.4							5	1	8			14	8.7																	
C	5	3	8		16	7.4	1					6.7	7	1	5			13	8.1					1												
D	2	2	4		8	3.7																														
E	2	3	10		15	7.0						6.7			2			2	1.2																	
F	1	1			2	0.9								1				1	0.6																	
G	3	1	1		5	2.3									3			4	2.5																	
H	4	3	4		11	5.1						6.7		2	5			9	5.6																	
I	4	4	1		9	4.1								4	4			10	6.2																	
J	4	4	1		9	4.1								3	1			4	2.5																	
K	3	2	13		18	8.3	1					6.7	5	3	15			23	14.3						1	1										
L	2	2			4	1.9								2	3			4	2.5																	
M	2	2			4	1.9								2	3			9	5.6																	
N	13	8	21		42	19.4	3					20.0	2	3	6			11	6.7						2	2										
O																																				
P																																				
Q																																				
R																																				
S																																				
T																																				
U	1	1	13		15	7.0						6.7			13			14	8.7																	
V	1	1	31		32	14.7						26.5	7	3	26			36	22.5																	
Total	44	43	129		216	100.0	7	2	6	15	100.0	36	23	102	23	102	161	100.0	1	2	11	2	11	14	100.0	2	3	11	3	11	16	100.0				
Percentage	20.0	20.0	60.0		100.0	100.0	46.0	13.4	40.0	13.4	100.0	23.7	14.3	62.0	14.3	62.0	100.0	100.0	7.3	14.4	79.3	7.3	14.4	79.3	100.0	12.3	18.7	69.0	12.3	18.7	69.0	100.0				
Chips:																																				
Collection A	38	39	55	4	136		47	4	170	221		55	34	189	3	281		22	5	96	11	134														
Percentage	28.0	29.0	40.0	3.0	100.0		21.2	1.8	77.0	100.0		19.6	12.1	67.0	1.3	100.0		16.5	3.7	71.6	8.2	100.0														
Collection B	29	28	81		138																															
Percentage	21.0	20.4	58.6		100.0																															

Large blade types:

Chips:

TABLE 6.—Occurrence, by sites, of projectile-point and blade types, rock material, chips, and other artifacts—Continued

Projectile-point and blade types, chips, other artifacts, and potsherds.	AU-16					AU-17					AU-18					AU-21					AU-22																	
	Chert	Quartz	Quartzite	Greenstone	Total	Percentage	Chert	Quartz	Quartzite	Greenstone	Total	Percentage	Chert	Quartz	Quartzite	Greenstone	Total	Percentage	Chert	Quartz	Quartzite	Greenstone	Total	Percentage	Chert	Quartz	Quartzite	Greenstone	Total	Percentage								
Projectile-point types:																																						
A.....					1	1.6																																
B.....					1	1.8																																
C.....					1	1.8																																
D.....					1	1.8																																
E.....					1	1.8																																
F.....					1	1.8																																
G.....					2	3.7																																
H.....					2	3.7																																
I.....					1	1.8																																
J.....					1	1.8																																
K.....					4	13.0																																
L.....					2	11.2																																
M.....					2	9.4																																
N.....					3	9.4																																
O.....																																						
Large blade types:																																						
P.....					7	13.0																																
Q.....					1	1.8																																
R.....																																						
S.....																																						
T.....					1	24.0																																
U.....					6	13.0																																
V.....					1	13.0																																
Total.....	9	6	38	1	54	100.0	5	17	39	1	62	100.0	10	4	23	4	37	100.0	16	6	4	6	26	100.0	1	5	1	5	26	100.0	1	1	1	1	6	100.0		
Percentage.....	16.7	11.2	70.3	1.8	100.0	100.0	8.0	27.4	63.0	1.6	100.0	27.0	10.8	62.2	100.0	61.8	23.0	15.2	100.0	61.8	23.0	15.2	100.0	61.8	23.0	15.2	100.0	61.8	23.0	15.2	100.0	61.8	23.0	15.2	100.0			
Chips:																																						
Collection A.....	11	16	117		144	100.0	6	35	201	3	245	100.0																										
Percentage.....	7.7	11.0	81.3		100.0	100.0	2.7	14.0	82.0	1.3	100.0																											
Collection B.....																																						
Percentage.....																																						

TABLE 6.—Occurrence, by sites, of projectile-point and blade types, rock material, chips, and other artifacts—Continued

Projectile-point and blade types, chips, other artifacts, and potsherds	RB-4					RB-5					RB-6					RB-7														
	Chert	Quartz	Quartzite	Greenstone	Total	Percentage	Chert	Quartz	Quartzite	Greenstone	Total	Percentage	Chert	Quartz	Quartzite	Greenstone	Total	Percentage	Chert	Quartz	Quartzite	Greenstone	Total	Percentage						
Projectile-point types:																														
A.....																														
B.....																														
C.....																														
D.....																														
E.....																														
F.....																														
G.....																														
H.....																														
I.....																														
J.....																														
K.....																														
L.....																														
M.....																														
N.....																														
O.....																														
Large blade types:																														
P.....																														
Q.....																														
R.....																														
S.....																														
T.....																														
U.....																														
V.....																														
Total.....																														
Percentage.....																														
Chips:																														
Collection A.....	4	1	25																											
Percentage.....	13.4	3.1	83.5																											
Collection B.....																														
Percentage.....																														

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