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**AN EVALUATION OF
PREHISTORIC CULTURAL RESOURCES
AT THE
CHAPEL FARM ESTATE PROPERTY
BRONX, NEW YORK**

RECEIVED
ENVIRONMENTAL REVIEW

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LANDMARKS PRESERVATION
COMMISSION

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MANAGEMENT SUMMARY

PREVIOUS CULTURAL RESOURCES SURVEY WORK AT CHAPEL FARM ESTATE

Chapel Farm Estates has been under archaeological investigation since 1990. A lithic workshop site was discovered in the 1B work and recommended for a Stage 2 investigation. This work was carried out. The workshop artifact assemblage demonstrated several puzzling aspects; virtually all of the lithic material recovered was quartz and the quartz debitage exhibited little cortex. The material was judged to be natural or historic shatter in which a few prehistoric tools were found. Additionally, the site was highly disturbed. No additional work was recommended at this site. This report was not accepted by the New York City Landmarks Commission. An alternative explanation of the workshop was proposed: the workshop was part of a prehistoric quartz quarry. Additional field work was carried out and a revised Stage 2 report supporting the quartz quarry hypothesis was submitted. This report was not accepted by the New York City Landmarks Commission for lack of evidence supporting the hypothesis.

CURRENT CULTURAL RESOURCE INVESTIGATION

Sheffield Archaeological Consultants conducted field reconnaissance and subsurface archaeological testing at Chapel Farm Estate in the Spring of 1994. The sites identified by previous research as quarry related sites were located and re-examined. The quartz quarry complex model presented by previous researchers was tested in the field. Lithic materials from the Stage 2 workshop excavation were re-analyzed by specialists familiar with quartz lithic technology.

Chapel Farm Estates contains a highly disturbed prehistoric quartz lithic reduction workshop site in which quarried quartz was shaped into preforms or blanks. While quartz outcrops are evident within the project area, and loose blocks of quartz are found in landscaped areas, the high degree of disturbance by nineteenth and twentieth century landscaping precludes identifying any

other components of a quartz quarry complex or demonstrating the validity of the quarry complex model presented in the previous research.

No diagnostic prehistoric artifacts were recovered at Chapel Farm Estate during any stage of archaeological investigation.

We find that the site lacks integrity due to extensive land disturbance and is, therefore, not eligible for inclusion in the National Register of Historic Places. We recommend no further work at this site.

I. SUMMARY OF PREVIOUS ARCHAEOLOGICAL SURVEY WORK AT CHAPEL FARM ESTATE

The CHAPEL FARM ESTATE is located in the Riverdale section of the Bronx on the Riverdale Ridge, the highest point in the Bronx. Beginning in 1990, cultural resource investigative work has been carried out on this privately owned fifteen acre land parcel. This 1994 Evaluation of Prehistoric Cultural Resources was required by the City of New York Landmarks Preservation Commission after review of the previous Stage I and Stage II reports. Those reports are reviewed and summarized here in some detail. The reports include:

REVISED CULTURAL RESOURCES REPORT FOR CHAPEL FARM II, RIVERDALE NEW YORK. June 1990. City/Scape: Cultural Interpretations, written by Gail Guillet.

ARCHAEOLOGICAL FIELD RECONNAISSANCE (sic), SEQR PARTS 1B & 3, CHAPEL FARM II, BRONX COUNTY, NEW YORK. October 1990. Hartgen Archaeological Associates, Inc., written by Karen S. Hartgen.

CHAPEL FARM II, BRONX, NEW YORK, CULTURAL RESOURCE INVESTIGATIONS, STAGE II. January 1991. Historical Perspectives, Inc., written by Cece Kirkorian and Betsy Kearns.

CHAPEL FARM ESTATE, RIVERDALE, BRONX, NEW YORK, SEQR #89PR111, CEQR #85-325-X, CULTURAL RESOURCE INVESTIGATION, STAGE 2 AND QUARRY INVESTIGATION SURVEY (QIS). March 1993. City/Scape: Cultural Resource Consultants and Historical Perspectives, Inc. written by Gail Guillet and Cece Kirkorian.

CHAPEL FARM ESTATE PROJECT MEMORANDUM. March 1993. Philip LaPorta, Consultant.

CHAPEL FARM ESTATE, RIVERDALE, BRONX COUNTY, NEW YORK, SEQR #89PR111, CEQR #85-325-X, FIELD INVESTIGATION AND GEOLOGICAL RECONNAISSANCE. December 1993. LaPorta Associates, written by Philip LaPorta.

These prior studies identified a lithic workshop site and a possible prehistoric quartz quarrying complex on the property. The primary tasks in

our investigation are to confirm or deny these identifications, to assess their value as cultural resources, to assess the impact of planned land use upon them and to recommend mitigation if needed. To these ends, it is necessary to review the prior research and assemble the background data necessary to our research in an organized and accessible manner.

SUMMARY REVIEW OF: STAGE IA

REVISED CULTURAL RESOURCES REPORT FOR CHAPEL FARM II, RIVERDALE, NEW YORK. June 1990. City/Scape: Cultural Interpretations, written by Gail Guillet.

ENVIRONMENTAL SETTING

The study area is located on Riverdale Ridge, the highest point in the Bronx — elevations of 260 to 280 feet above mean sea level. There is evidence in the paths, walls and plantings of intensive landscaping. The site is "characterized by rock outcroppings although there are areas where a considerable amount of soil has been deposited." (Unclear; is it naturally deposited, landfill or the work of gardeners?) The majority of the site consists of moderate to steep slopes with a few plateaus.

The site is on the Manhattan Prong which is made up of igneous and highly metamorphosed rock with intrusions of granite. Fordham Gneiss is the underlying rock.

There is no discussion of current or past flora or fauna.

PREHISTORIC SETTING

This section of this report draws heavily from Arthur Parker, *THE ARCHAEOLOGICAL HISTORY OF NEW YORK* (1923); William Ritchie, *THE ARCHAEOLOGY OF NEW YORK STATE* (1980 Revised); William Ritchie, *AN INTRODUCTION TO HUDSON VALLEY ARCHAEOLOGY* (1958); Bert Salwen, *POST-GLACIAL ENVIRONMENTS AND CULTURAL CHANGE IN THE HUDSON RIVER BASIN* (1974); and Robert Funk, *RECENT CONTRIBUTIONS TO HUDSON VALLEY PREHISTORY* (1980).

Using these sources, the text explores the Native American exploitation of the resources of the Hudson River valley. Charts from Funk and Ritchie are reproduced to show cultural time lines and expected artifacts.

Several sites near the study area are listed. Arthur Parker (1923) lists these reported by William Beauchamp:

1. A large site in Van Cortlandt Park.

This 14 acre site, west of Van Cortlandt Lake contained bowl shaped fireplaces, shells

and four skeletons. Another nine burials were nearby. Bone and stone tools were found and a shell heap was located on the topmost knoll southeast of the lake.

2. A shell heap east of Fieldston Road and north of 247th Street.

3. A shell heap located north of West 247th Street and west of Pascal Avenue. (Pascal Avenue no longer exists).

4. A shell heap located on the Hudson River north of the Riverdale Station.

5. Parker also mentions a village site at the mouth of Tibbet's Brook. No details are related.

6. Riverdale Park: "several" sites located by the Riverdale Archaeological Project in 1985. These were all shell middens which Guillet visited in 1989. She had no more information about them.

These sites are referenced in later reports with no elaboration of information as to artifacts recovered, dating, cultural affiliation, etc.

HISTORICAL BACKGROUND

A thorough review of regional history and site land use history finds that although the study area was included in colonial land transfers, it would appear that its function was purely agricultural until the late nineteenth century. This rough, rock strewn parcel did not lend itself to habitation or cultivation and probably served to harbor grazing animals.

In 1785 it became part of a farm owned by George Hadley. In 1853 map evidence indicates that it belonged to William Ackerman. An 1873 map shows the contiguous Riverdale Institute, a religious organization, in existence. On the same map, the project area is part of an estate owned by Frederick Goodridge. By this point in history Riverdale had shed its simple farming past and had become a neighborhood of elegant estates and villas. The Goodridge Manor House was on a different part of the estate — where the Riverdale Temple now stands. Two unidentified buildings appear within the project area; this is the first map evidence of any structures within the project area. Mr. Goodridge in 1886 is known to have had on his estate in addition to his manor house, gardens, a greenhouse, a barn, a chicken coop and a stable. The structures are not identified on the map — one is square and the other appears L-shaped.

In 1923, the Goodridge estate was sold to the Order of the Living Christ, an Episcopalian organization funded by a Mr. Griscom. Griscom died soon after, but his widow continued to live on the estate and run it as a retreat or

camp. Between 1924 and 1932 she had the following buildings erected on the site:

- a. wood building with stucco
- b. wood building with stucco
- c. wood building with stucco
- d. wood building (The Chapel)
- e. stone building (The Mansion)

All of the above buildings are outside of the project area, having been sold separately from Chapel Farm II.

- f. wood prefabricated cottage
- g. wood prefabricated cottage
- h. wood outbuilding
- i. wood outbuilding
- j. wood prefabricated cottage
- k. wood outbuilding
- l. wood prefabricated cottage
- m. wood outbuilding
- n. wood outbuilding

None of these nine buildings remain standing. Some ruins remain and at least one may incorporate one of the two nineteenth century buildings mentioned previously.

→ A newspaper article from 1969, the year the property was purchased by Manhattanville College, described the elaborate retreat. Clement Griscom and his wife, Genevieve, founded the retreat in 1917 (sic). He died in 1918, but she lived until 1958, maintaining Chapel Farm. Seven (7) gardeners groomed the "velvety moss lawns" and encouraged the spring flowers and dogwood. Flagstone paths connected the various buildings, one of which was a cottage for the return of Jesus Christ — it had a pot-bellied stove and pictures cut from magazines on the wall. The Mansion, where Mrs. Griscom lived year

round, was much more elaborately decorated. In 1969, six of the prefabricated cottages and outbuildings remained. Chapel Farm had ties with the Episcopal Church and the Theosophical Society and was the country retreat for a mission school Mrs. Griscom supported in the Chelsea area of Manhattan.

STAGE 1A CONCLUSIONS AND RECOMMENDATIONS

The project area was found to contain the possible remains of two nineteenth century buildings and a number of early twentieth century buildings. A recommendation was made to try to locate the remains of the nineteenth century buildings.

The project area, because of its proximity to several known prehistoric sites, was found to have average potential for the presence of prehistoric artifacts. A walkover by Gail Guillet and Karen Hartgen identified several potential sites and a Stage 1B investigation was recommended. Speculation, based on Ritchie's description of a preference during the Transitional Period for burial at the summit of the highest hill, suggested a potential prehistoric cemetery.

COMMENTS FROM SHEFFIELD ARCHAEOLOGICAL CONSULTANTS

We find no problem with the historical research on this property, but must question the prehistoric background material. Save for the inclusion of the work done by the Riverdale Archaeological Project, 1985 to 1989, no references more recent than 1980 are used. Much has been published on prehistoric archaeology of the Hudson and coastal areas. In the late 1980s, the Landmarks Commission itself conducted an archaeological assessment of fifteen city-owned cultural institutions including Wave Hill; a report was published in 1991 (Baugher, Lenik and Pagano 1991). Brooklyn College conducted archaeological field schools in 1990 and 1991 at Van Cortlandt Park (Bankoff and Winter 1991). In 1991, Edward J. Lenik published an article surveying and summarizing ten years' of cultural resource surveys conducted within the city (Lenik 1991). These projects were either ongoing or accessible through Landmarks while the Chapel Farm Estate investigations were in progress. The use of the term "Lenni-Lenape" suggests that all available current research was not utilized by prior investigators.

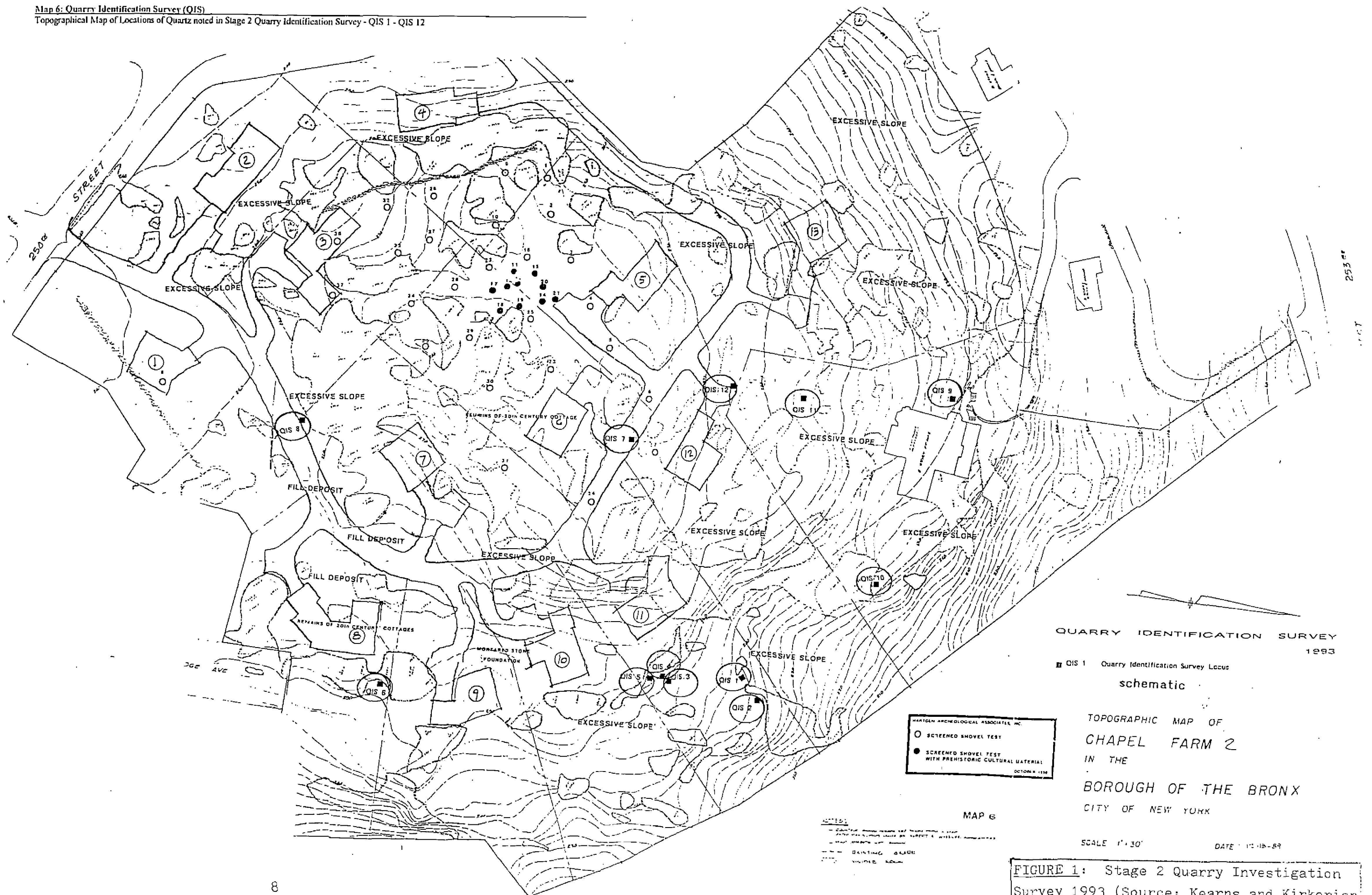


FIGURE 1: Stage 2 Quarry Investigation Survey 1993 (Source: Kearns and Kirkorian 1993).

STAGE 1B RECOMMENDATIONS

Because the Chapel Farm subdivision would directly impact the prehistoric site through soil removal and redistribution, a Stage 2 investigation was recommended for this area. The purpose of this Stage 2 investigation would be to identify the activities which took place at this lithic site, to determine the limits of the site, to expose any features, and retrieve any datable charcoal samples and culturally diagnostic artifacts so that the eligibility of the site for National Register of Historic Places listing could be determined.

The nineteenth century foundations and the twentieth century surface remains were judged not eligible for listing on the National Register of Historic Places, so no further work was recommended for these sites.

COMMENTS FROM SHEFFIELD ARCHAEOLOGICAL CONSULTANTS

We find this report to be adequate and the work performed to be appropriate as far as it went. It is not clear to us whether or not the investigators were provided with a footprint of the proposed project at this time. The Stage 2 map of the site with the Stage 1B tests indicated has crude buildings drawn in. At first we thought these were the twentieth century structures from The Order of the Living Christ, later we decided they were an early version of the footprint. No comments are made as to the impact of the footprint on the plan of testing. Some parts of the footprint appear to include slopes in excess of 15%; indeed, some of the later identified QIS sites are in these excessive slope areas and within the project footprint. We feel these areas should have been examined in the Stage 1B, not because of the quarry theory, but because the footprint threatened them. Had this been done, some items — the hammerstones, for example — might have been identified earlier. We also believe that quartz resources should have been searched for elsewhere on the property. Greater diligence in this phase of work might have prevented the ensuing confusion and delays.

SUMMARY REVIEW OF THE ORIGINAL STAGE 2 REPORT

CHAPEL FARM II, BRONX, NEW YORK, CULTURAL RESOURCE INVESTIGATIONS, STAGE II. January 1991. Historical Perspectives, Inc., written by Cece Kirkorian and Betsy Kearns.

In December 1990, Historical Perspectives, Inc. was hired to carry out the Stage 2 investigations of the lithic site identified in Stage 1B. The Principal Investigators were Betsy Kearns and CeCe Kirkorian. Faline Schneiderman-Fox was the Project Director. Field personnel included Mary Dieter, Michael Silva, and Gail Guillet and Karen Hartgen, who had conducted the Stage 1A & 1B investigations.

The Executive Summary for this report states that "the age, cultural affiliation, type and duration of occupation at this site was not determined during Stage 1 or 2 investigations and will not be determined through additional work due to extensive disturbance." The site was found disturbed to such a degree that it did not appear to meet register criteria. Historic landscaping activities appeared to have destroyed all integrity and there was a possibility that the soil containing the lithic material had been brought in ~~fill~~. Because the site was so disturbed as to have little research value, "an expansive Stage 2 report was not necessitated."

Investigative work in this Stage 2 was limited to the lithic site identified in Stage 1B. No work of any kind was carried out outside of this area.

"Fifteen 1x1 meter test units were shovel shaved by quads in ten centimeter levels noting stratigraphic sequences and changes. All soil was screened through 1/4 inch hardware cloth, and all cultural material found in the screen or in situ were collected and labeled." No features were encountered. No soil samples were taken. Three additional 50cm. x 50cm. tests were excavated to determine the outer boundaries of the site. The site map is reproduced here (Figure 2).

The lithic material removed was analyzed for bulbs of percussion, flake scars, and striking platforms. Tool edges were observed for obvious signs of retouch and use. "The prehistoric site consisted of nothing other than lithic material, predominantly quartz." A total of 264 pounds of quartz and 2 1/2 pounds of quartzite was recovered.

Analysis found that the majority of the quartz fragments were blocks and

chunks appearing to be of historic or natural origins. Some tools and prehistoric debitage were identified, but they were found to be a very small component of the collection. Ernest Wiegand, archaeologist at Norwalk Community College in Norwalk, CT, identified some of the tools. We have included the Stage 2 Site map and the Stage 2 Plan of excavation here. (Figures 2,3).

STAGE 2 SIGNIFICANCE

The following comments were made in a discussion of the significance of the site in the 1B report.

- * Valerie DeCarlo of the Riverdale Archaeological Project at Wave Hill reported to Cece Kirkorian that similar terraces in the Bronx have yielded quartz cobbles and chert tools, neither of which were present here.

- * Dennis Weiss, Chairman of the Department of Planetary Sciences at City College in New York, stated that quartz blocks and flakes from this site could be local and unworked, resulting from a natural shatter sequence.

- * No natural outcrops of quartz were observed on the property.

- * The site was heavily landscaped during the twentieth century and fill may have been brought in to create level plateaus such as the one on which the site is located. There is precedent for the decorative use of quartz in gardens. The Justin Morrill Homestead in Vermont is cited as an example of this use.

- * The presence of a few prehistoric tools indicates that a small portion of the quartz is of prehistoric origin, but no diagnostic materials were recovered. A possible date of Late Archaic is advanced because sites of this era yield more quartz than other sites. (Ritchie appears to be the source of this observation about quartz).

It was concluded that the site does not meet register criteria due to extensive disturbance. Historic material was recovered in every soil layer.

No additional work was recommended.

COMMENTS FROM SHEFFIELD ARCHAEOLOGICAL CONSULTANTS

The decision to forego a full scale Stage 2 report was unfortunate, as greater detail would be welcome. In depth discussion of suggestions such as a few prehistoric quartz tools just tossed by chance into a historic or natural

STAGE II - MAP 3

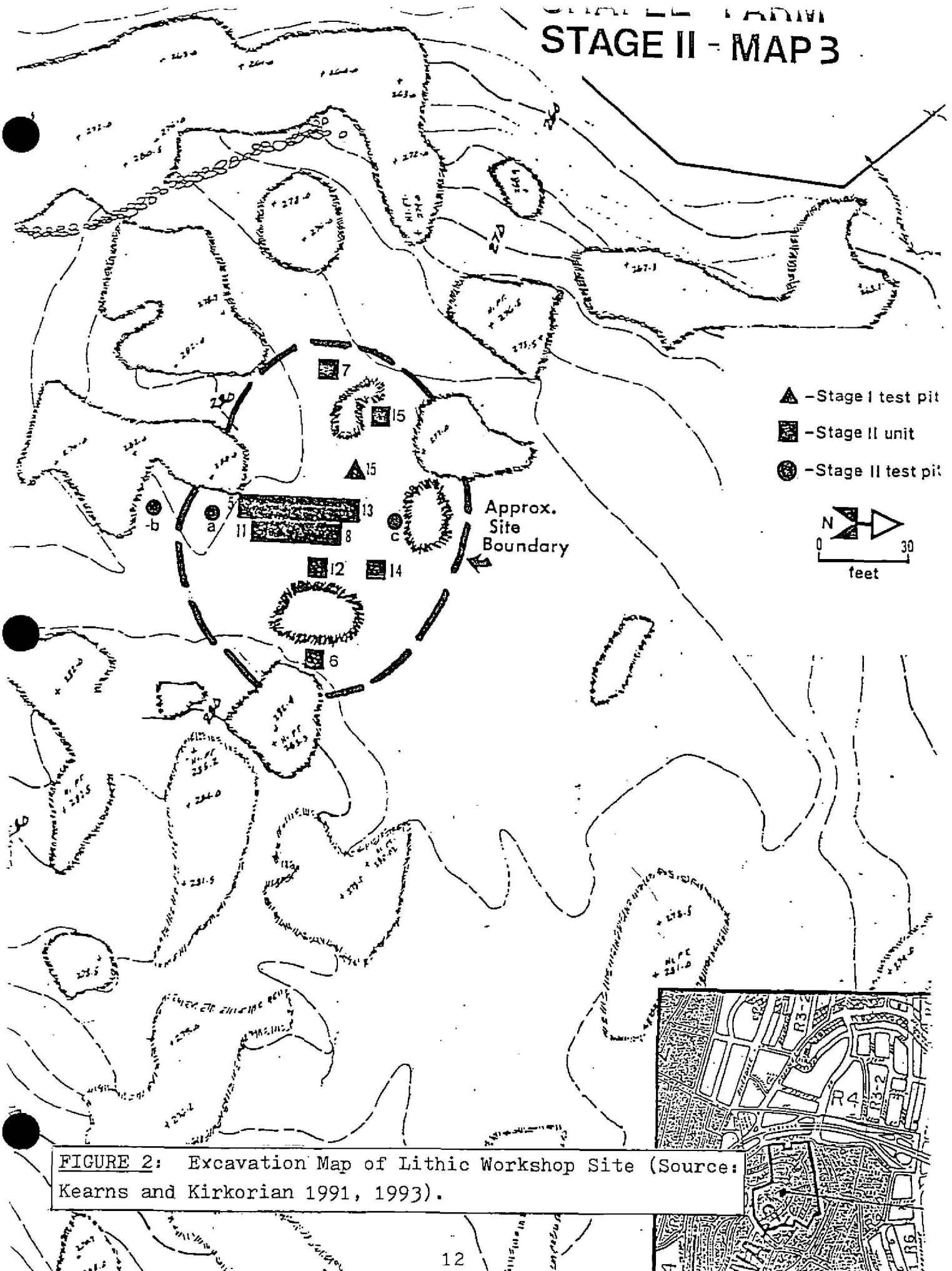


FIGURE 2: Excavation Map of Lithic Workshop Site (Source: Kearns and Kirkorian 1991, 1993).

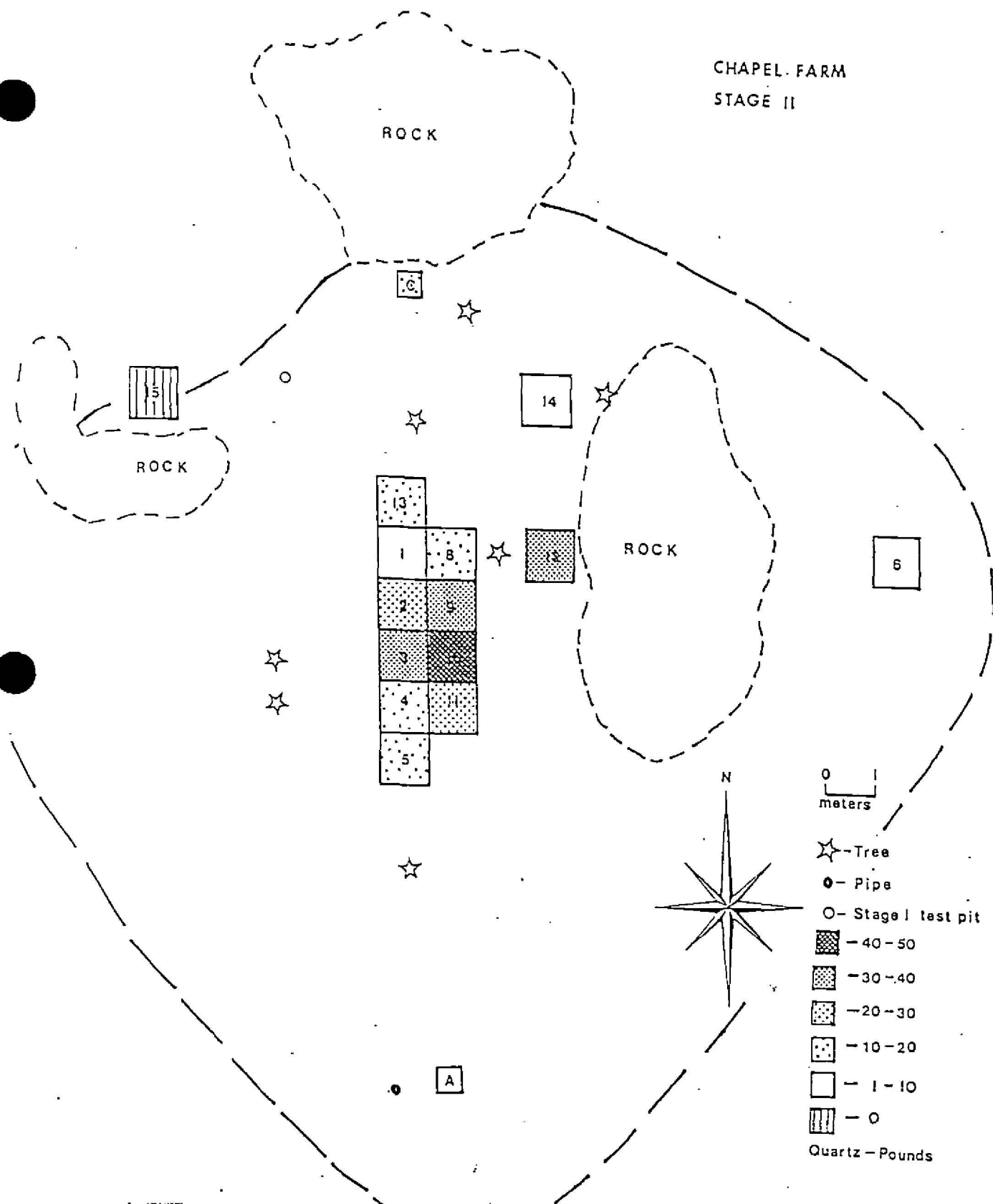


FIGURE 3: Map of Test Locations (Source: Kearns and Kirkorian 1991, 1993).

MAP 4

Test Locations with
Artifact Densities

quartz shatter event might have forced the investigators to recognize that this idea was not well founded. At a minimum, the investigators should have recognized the recovered quartz for the prehistoric artifact assemblage that it was. The investigators did not take note of the subtle signs of worked quartz. Quartz is a material with a crystalline structure; it fractures the same way, whatever the source of applied force. However, it can be worked with thought, skill and deliberation. One quartz flake or blank may be hard to defend as human made, but 264 pounds of quartz in which the same shapes occur over and over is unmistakably the result of a planned, skilled manipulation of materials. There should have been no question that this material was artifacts, not naturefacts and the Stage 2 analysis should have been as clear about this as it is was about the disturbed nature of the site. Time spent in the lab at this point could have prevented much grief.

STAGE 2 CONSEQUENCES

In the normal sequence of events, the cultural resource investigation of this property would have ended here with the presentation of the Stage 2 report recommending no further work. However, certain aspects of the recovered material puzzled many observers. Daniel Pagano of the Landmarks Preservation Commission visited the site during the Stage 2 excavations. He suggested that the material was builder's shatter. Karen Hartgen and her associates disagreed. The ambivalence is clear in the Stage 2 report. The only thing on which all agree, is that the site is disturbed and, therefore not eligible for listing on the registers. We do not have documents indicating that the Stage 2 report, completed in January 1991, was rejected by the Landmarks Preservation Commission, but we see that it was under review more than a year and a half later. The directive to conduct further investigations and submit a revised Stage 2 came from a meeting between Landmarks and the research team on December 3, 1992.

Before we review the Revised Stage 2, let us outline those aspects of the recovered material that were so puzzling.

1. The recovered material was virtually all quartz with some quartzite. No tools or debitage in other materials such as chert were found.

No other documented site in the area reported quartz as the virtually only lithic material present.

2. No features were found and no artifacts other than lithics were recovered.
3. No quartz cobbles were found.
4. No cortex was reported on any of the quartz debitage. The majority of quartz lithic reduction sites with which the researchers were familiar used cobble quartz. These glacially transported and water tumbled small boulders have a distinct cortex which is found on much of the debitage.
5. Outcroppings of quartz had not been noticed within the project area or in the surrounding area.
6. Indeed, quartz was rarely mentioned as present in description of the geological formations of this part of the Bronx. What quartz there was here available to *prehistoric peoples* was assumed to be cobble quartz.
7. There are known examples of quartz used decoratively in historic gardens. However, there is no known landscaping use for quartz fragments in such a quantity worked into the soil.

SUMMARY REVIEW OF THE REVISED STAGE 2 AND QUARRY INVESTIGATION SURVEY

CHAPEL FARM ESTATE, RIVERDALE, BRONX, NEW YORK, SEQR #89PR111, CEQR #85-325-X, CULTURAL RESOURCE INVESTIGATION, STAGE 2 AND QUARRY INVESTIGATION SURVEY (QIS). March 1993. City/Scape; Cultural Resource Consultants and Historical Perspectives, Inc., written by Gail Guillet and Cece Kirkorian.

A long introduction to this report begins, "On January 4, 1993, Philip LaPorta, in the company of Gail T. Guillet, principal of CITY/SCAPE: Cultural Resources Consultants, and Cece Kirkorian, one of the principals of Historical Perspectives, Inc. examined the Chapel Farm Estate site as part of an on-going Stage 2 investigation." In fact, LaPorta and Guillet first visited the site on November 9, 1992. Nearly two years had elapsed since the completion of the original Stage 2 report.

This introduction reviews the list of prior investigations and discusses the Stage 1A and 1B and the original Stage 2. Note is made of Dan Pagano's visit to the site and his questioning of the conclusion that this was, indeed, a prehistoric site. He was concerned that the site did not fit the profile for known prehistoric sites in the Bronx, especially in the nature of the quartz recovered.

While the original Stage 2 was still being reviewed by Pagano, Karen Hartgen discussed the site with Philip LaPorta and learned that the site did fit the profile for a lithic workshop associated with a prehistoric quartz quarry. Philip LaPorta is a professional geologist who has devoted much of his original research to understanding the origins and occurrences of lithic materials preferred by prehistoric peoples. His experience lies mainly with chert resources, but he has investigated quartz and other lithic material resources as well.

During the November 9, 1992 investigation of the site, reconnaissance was made not only of the workshop area and the level plateaus, but of those areas with slopes in excess of 15%. Hammerstones not previously identified were noted within the project area. These came in a variety of sizes and materials, many of them quartzite. Two large quartz blocks were found near the mansion house and a series of smaller blocks were found near a cottage foundation. No quartz outcrops were located, but the nature of the landscape was such that La Porta felt the site contained a quartz quarry.

Material from the Stage 2 excavations was reexamined by Karen Hartgen and Gail Guillet. More tools were identified and sets of material from the site were sent to the following people for evaluation in light of the quarry theory.

Robert Funk, New York State Archaeologist

Eugene Boesch, New York City Landmarks Preservation Commission

Philip LaPorta

Robert Funk responded in a letter to Karen Hartgen on November 24, 1992 stating that the material was prehistoric and strongly supported the identification of the site as "an aboriginal stone quarry and workshop." He characterized the site as "very unusual" and "definitely eligible for the National Register of Historic Places."

A meeting was held at NYC LPC on December 3, 1992 and a new survey of the project area was required in light of the quartz quarry hypothesis. This survey was conducted in January of 1993. Portions of the area near the cottage foundation containing the quartz blocks were excavated, revealing a flagstone walk lined with the quartz and other stone blocks. (There are no plans of this excavation, no description and, apparently, no recovered artifacts). Several quartz outcrops were located with hammerstones in association. The hammerstones were not collected.

A second survey was done later in January. This survey looked for quartz outcrops near, but not in, the project area. Several were located.

The introduction concludes that Chapel Farm Estate is the site of a prehistoric quartz quarrying complex unlike any other site here-to-fore discovered within New York City.

The body of the report follows, beginning with a reprint of the original Stage 2 report, minus its conclusions and recommendations. Instead, it moves directly into a discussion of quartz quarry complexes. Philip LaPorta and Robert Funk are quoted. It should be noted that discussion of register eligibility shifts here from the eligibility of the disturbed lithic workshop to the eligibility of the putative quarry complex.

The twelve QIS (Quarry Investigation Survey) sites are briefly summarized using a tabular format. They are also located on a map and presented in black and white photographs. Three categories are used to classify and describe

these sites although one of the sites falls into none of these categories. The reader is left to sort it out.

QIS sites 8, 11, and 12 are "quartz blocks used as landscape elements or as part of retaining walls"

QIS8 "was a quartz block incorporated into a retaining wall on the extreme southern edge of the Chapel Farm Estate property."

QIS11 "were two free-standing quartz blocks (approximately 3'x4' each) in the extended rear lawn area of the mansion."

QIS12 "was a large area (approximately 28') adjacent to the site of a twentieth century cottage."

An examination was made of QIS12 which was approximately 200 feet northeast of the Stage 2 workshop excavations. "A concentration of large quartz blocks adjacent to the stone steps and collapsed roof timbers of a twentieth century cottage, many of which were lying on the surface of the ground, possibly represent the 'tailings' or initial reduction in a quarrying process. However, they appear to be displaced from an original reduction process area. As the leaf mat and root cover were removed from around the 'tailing' blocks locus, a stepping-stone walkway, lined in quartz blocks was revealed. Twenty-six aligned paving stones and steps were counted. The use of the blocks for decorative landscaping confirms the original Stage 2 findings of site disturbance."

QIS sites 1, 5, and 9 are described as "quartz vein outcrops associated with quarry processing tools."

QIS1 "in close proximity to QIS2 on the eastern perimeter of the project knoll, a 'beaked' wedged-shaped pounding stone was noted on the ground surface in direct association with a small quartz vein outcrop."

QIS5

QIS9 "At two quartz vein outcrops, hammerstones were noted adjacent to the veins."

The observation is made that given the degree of landscaping done here in the past hundred years, these hammerstones are not assumed to be IN SITU, but, perhaps, "in a relative proximity to the original deposition." LaPorta identified a number of hammerstones and portable anvil stones on the surface of the surveyed area, noting that their presence was UNCHARACTERISTIC of most reported quartz quarries.

QIS sites 2, 3, 4, 6, and 7 are "quartz vein outcrops that were not visibly associated on the surface with what Professor LaPorta recognizes as quarrying tools." These sites are not described individually. They are east-west trending and all the result of one geological event.

QIS10 "was an examination (shovel test) of the face/talus of a possible rockshelter, but yielded no prehistoric material."

REVISED STAGE 2 AND QUARRY SITE INVESTIGATION CONCLUSIONS AND RECOMMENDATIONS

The quartz vein outcrops along the eastern side of the project area, whether or not tools were found in association, were "estimated" to represent "abandoned operations or potential prospect pits and areas of testing and exploration." In other words, they were either worked out by prehistoric peoples or are still waiting to be found by prehistoric peoples, being part of an area actively explored for resources by those people. The outcrops and the displaced blocks are part of a much larger prehistoric exploitation system "including the AS YET UNLOCATED Chapel Farm Estate quarry locus and at least two outcrops off the site."

The offsite outcrops are described in an appended memorandum. We speculate that the tools may have been overlooked at these other unidentified sites.

LaPorta next discusses the field observations and evidence at the project area. The quarry site has not been located, but BASED ON THE ORGANIZATION OF OTHER PREHISTORIC QUARRIES IN THE NORTHEAST, it is suggested that it is about 100 meters north and east of the Stage 2 excavation in the area of QIS 7.

The geological formation of the quartz is discussed. "Surface indications suggest that the quarry location consists of at least two intersecting conjugate veins of solution hydrothermal quartz. Surface textures found on excavated

*Is this common?
The archaeologists?*

blocks (which excavated blocks?) indicate that the quartz veins were emplaced after the primary phases of deformation in the schist had already occurred. Cold emplacement of the quartz veins permits the outer surface of the quartz to mimic the fabric and texture of the mica grains in the surrounding country rock." Other quartz veins, located to the north of the presumed quarry are also part of the same geological event.

Finally, LaPorta states that his examination of the material from the workshop and the material from the outcrops indicates that the workshop material is from this quartz formation. That is not to say that it is absolutely from a quarry on this property, but at least from a quarry related to these outcrops and in relative proximity to the project area. Part of the megascopic evaluation notes that the joint surfaces of the quartz outcrops at Chapel Farm Estates and in the surrounding area are essentially horizontal with secondary joint surfaces which create orthogonal blocks with 120 degree and 60 degree angles. This phenomenon means that percussive force to break the quartz loose must be at a 90 degree angle and of great impact. Were the joints parallel to impact, the task would be easier.

Once again, the quarry complex sites and their presumed locations are reviewed. The QUARRY is at QIS 7; the TAILINGS PILE is at QIS 12, the blocks moved by gardeners to line the walk; the ORE REDUCTION SITE should lie between QIS 12 and the Stage 2 excavation site; the LITHIC REDUCTION SITE is the Stage 2 excavation site. (We are confused here as to why the Ore Reduction Site is between QIS 12 and the Stage 2 site; the description first given for the placement of the Ore Reduction site is BELOW the quarry face and much of the area between the two sites given here is ABOVE the putative quarry space).

The quarry complex organization predicted by LaPorta is based on his own observations and quarry complex descriptions in the archaeological literature. He cites Gerald Dunn, 1945 — "The Oaklawn Soapstone Quarry;" Powell 1965 (no documentation); and Zern, personal communication (no documentation). He notes that non-portable anvils, often bedrock outcrops, are associated with the reduction sites. Often an apron of fine flaking debris will surround such an outcrop.

Hammerstones and portable anvils found at Chapel Farm Estate included

many formed from diabase, a very dense form of basalt. Quartzite tools were present as well, but the presence of the diabase reflects the difficulties encountered in extracting this particular quartz. Some pounding instruments may weigh up to several hundred pounds and lie broken and battered at the foot of the quarry face. Wedge-shaped quartzite tools are often found in the ore reduction area; these are perhaps 15 to 20 pounds in weight and are usually beaked. Reduction sites such as the Stage 2 excavation site should contain tools from 8 to 10 pounds down to less than four ounces in weight. "Beaked" hammerstones are typical quarrying tools. Analysis of the size and materials of the various hammerstones should help delineate work areas.

EVIDENCE OF QUARTZ OUTCROPS FROM THE SURROUNDING AREA

The QIS survey conducted in mid January 1993 focused on the location of quartz near, but not within, the project area.

West of the property near the Russian Embassy, quartz veins from one inch to one foot in thickness were observed. Quartzite hammerstones and quartz debitage were seen on a nearby slope and large quartz slabs with joint angles like those of the quartz from the project area were noted.

East of the property, quartz veins were observed on the Furman Estate which is located on a steep slope on College Avenue. Constructed in the 1960's, the Furman home severely disturbed the soil of the area and in the ensuing years erosion has exposed a nearly vertical vein of quartz nearly five feet high, twelve feet long and up to one foot thick. LaPorta feels this newly exposed surface reflects the appearance and the resources that the prehistoric landscape offered during the Late Archaic and Transitional periods — very visible large outcrops of quartz. Near the newly exposed vein was another vein obviously worked because of its hacked surface and the presence of hammerstones on the nearby surface. Above these veins was an area of folded, exposed schist with cavities where quartz vein had once infilled. LaPorta characterizes these as exhausted quarries based on the presence of hammerstones nearby and quartz shatter and debris at the foot of these cavities. Unlike the Chapel Farm Estate, this area does not appear to have been heavily landscaped.

Returning to CONCLUSIONS AND RECOMMENDATIONS, it is clear that

*what about
this finding
Furman
house, as
noted
above?*

the analysis of the study area as a quarry complex and the interpretation of various parts of it as specific parts of a quarry complex are based on LaPorta's predictive model of a quarry complex. He recognized the quartz assemblage from the Stage 2 excavations as typical of a lithic reduction area usually associated with a quarry complex. He also recognized the elevated knolls and rock outcrops of the site as quarry territory. Therefore, he hypothesized the presence of quartz veins on the property or nearby. These were located and he then looked for evidence to support his model of the typical prehistoric quartz quarry. His model is based on what he has learned from Dunn, Powell and Zern put together with his own observations; some of the material he uses is specific to quartz quarries, some is not.

LaPorta and the QIS team note the presence of quartz in nearby middens and theorize that it has come from the Chapel Farm Estate Quartz Quarry Complex. They further note that quarried quartz technology has been ignored by archaeologists working in the coastal New York area. Either it has been unreported or unrecognized. Dunn's report on Dutchess Quarry Cave is quoted to the effect that most archaeologists are not sufficiently "sensitized" to recognize the "sometimes subtle" features that mark lithic prospecting and quarrying, thus making lithic quarrying and prospecting sites an under-reported class of prehistoric site. (It should be noted that LaPorta did the work identifying prehistoric chert quarrying complexes at Dutchess Quarry Cave).

Chapel Farm Estates is proclaimed the only identified prehistoric quartz quarry complex in New York City. Thus, it is of research value to understand resource exploitation patterns of Native Americans. It appears to be, according to Robert Funk's letter, the first actual quartz quarry and workshop ever reported in New York State and "possibly in coastal southern New England." Chapel Farm Estates can meet the National Register criteria of contributing "significantly to our understanding of the prehistoric past. However, the site integrity has been compromised by twentieth century gardening, construction and utility installation."

The significance of the site lies in the documentation of the larger procurement system so that future field and lab investigators will be attuned to lithic assemblages such as Chapel Farm has produced and will understand the large-scale landscape association between the various quarry features.

In view of all of this, the recommendation for further work was:

Searching
? will be
done

So, then,
this subsequent
discovery
is significant

* Site documentation and research data dissemination rather than site preservation.

*Prior to further development of the site, map the Chapel Farm quarry and staging areas in relationship to the vein outcrops ON AND IN THE SURROUNDING NEIGHBORHOOD.

In sum, the Quarry Investigation Survey work did not locate an actual Quarry site on the property, but presented a hypothesis for its location. The Tailings Pile was tentatively identified, but acknowledged to consist of materials moved by twentieth century gardeners and therefore, perhaps, not exactly where it was originally. Based on this tentative location of the Tailings Pile and the tentative location of the Quarry, the Core Reduction Area was assigned a range of space in which it should, tentatively, be found. In fact, this QIS work did no more than identify the nature of the Stage 2 workshop, presenting a rational explanation for the quartz assemblage originally found so puzzling.

COMMENTS FROM SHEFFIELD ARCHAEOLOGICAL CONSULTANTS

We do not think that this Revised Stage 2 report establishes the presence of a quartz quarry complex at Chapel Farm Estates. It explains the lithic workshop and hypothesizes additional features of such a complex. Fieldwork necessary to confirm the detectable presence of the additional features — the quarry, the tailings pile and the ore reduction site — was not carried out.

We find it most curious, therefore, to recommend mapping what has not been found, — even more curious to plan to disseminate research data to instruct other archaeologists on how to identify what has not been found.

Even more curious, geological field reconnaissance and mapping is recommended on property not owned by the client. The survey of nearby properties tentatively located worked and exhausted quartz quarry sites on both the Furman Estate and the Russian Embassy; from the descriptions and photographs presented, these sites appear to be undisturbed, unlike the highly disturbed Chapel Farm Estate study area. It is easy to understand the temptation to include investigation and mapping of these sites in the recommended additional work for Chapel Farm, but sponsoring this work is truly beyond the responsibility of the Chapel Farm landowner.

A more appropriate recommendation would have been additional field work at Chapel Farm Estate to prove or disprove the hypothesis or establish the lack of evidence to make a judgement. In essence, the Stage 2 work was left unfinished. The material recovered from the Stage 2 excavations was not thoroughly analyzed in light of the theory presented here as fact and the theory was not fully tested in the field. If the team had concluded that the disturbed nature of the site would prevent the proving of the quarry complex hypothesis in the field, that should have been firmly stated and the register eligibility of the site should have been addressed. It is established by this report that Chapel Farm Estates contains the highly disturbed remains of a lithic workshop of quarried quartz; the detectable presence of a major quarry and its other associated features is not proved. These are insufficient grounds on which to promulgate the discovery of the "first actual quartz quarry and workshop ever reported in New York State." It should first be proven, then mapped, with reports and the collection made available for study. If the Russian Embassy and the Furman Estate are register quality, undisturbed quarry complex sites, the Landmarks Commission should note that and be ready to enforce proper treatment of these resources by their owners. *How so?*

REVISED STAGE 2 AND QUARRY INVESTIGATION SURVEY CONSEQUENCES:

The Revised Stage 2 and Quarry Investigation Survey was submitted to the Landmarks Commission in March of 1993. Dan Pagano, who had been monitoring the project was on leave, so it was reviewed by Jean Howson. She issued a statement on the report May 17, 1993, finding that it did "not adequately address significant questions raised by the testing done on the site.

It is important at this stage:

- * to demonstrate conclusively that the Chapel Farm Estate is a lithic procurement site with associated tools and debitage
- * to indicate exactly how the proposed development of the site will affect the archaeological resource

* to provide all information necessary for the making of a determination as to whether preservation or mitigation is in order.

We do not have sufficient information to form a basis for discussion of what would constitute adequate mitigation."

Howson asked for additional work and revision of the report.
Specifically:

Provide a map or series of maps indicating the project footprint in relation to all field testing and reconnaissance accomplished to date.

Test to determine the extent of the site. Maps included indicate that only a small portion of the site was tested. Explain why, detailing the testing from all phases.

Conduct a gridded surface collection of the project footprint. — *was this done?*

Document the lithic collection better, providing thorough descriptions using an appropriate classification system. Document and analyze the distribution of material over the entire site.

Make an effort to establish that the quartz tools recovered are made of material from the outcrops using mineralogical means. — *this?*

Describe the quartz outcrops and assess whether or not they were quarried.

Incorporate the Quarry memorandum into the main report.

Address Professor Weiss's suggestion that the material is natural.

Examine lithics from Wave Hill looking for comparisons which may help date the Chapel Farm Estate material.

This review was apparently sent to Gail Guillet in the late summer or early fall.

The comments can be summarized quite simply. Jean Howson did it in her first paragraph. Prove you have a lithic procurement site here, show me how the development will affect the resources, provide enough information — not speculation — to let me make a judgement on the register eligibility and appropriate mitigation, if necessary.

AN ADDITIONAL DOCUMENT

CHAPEL FARM ESTATE, RIVERDALE, BRONX COUNTY, NEW YORK, SEQR #89PR111, CEQR #85-325-X, FIELD INVESTIGATION AND GEOLOGICAL RECONNAISSANCE. December 1993. LaPorta Associates, written by Philip LaPorta.

We believe that this document was not submitted to NYC LPC. It was completed well after the submission of the Revised Stage 2 in March 1993 and after Gail Guillet had received Jean Howson's Comments. It somewhat expands the Memorandum and, additionally, addresses the geology of the site and the surrounding area in relationship to the presence and the formation of quartz. It appears to be a response to Jean Howson's concerns about establishing that the worked quartz items from the Stage 2 excavation were indeed procured from lithic resources on site or in this general area. Our copy is minus a bibliography; we have not been able to obtain a copy of the bibliography.

LaPorta states directly in the revised opening of the Field Investigation section, "the researcher has concluded that the Chapel Farm Estates contains a previously unreported prehistoric quartz quarry, and that the lithic reduction area identified in the Stage 2 investigation carried out by CITY/SCAPE: Cultural Resource Consultants, Hartgen Archaeological Associates, Inc. and Historical Perspectives, Inc. is part of that quarrying operation. Further, the library research indicates that the presence of extensive quartz veins in the Fordham gneiss located on and in the vicinity of the project area has not been previously noted in the literature, nor has the potential of these veins as primary lithic resources for prehistoric peoples been explored."

Beyond this introduction, the report covers material presented in the Memorandum and reviewed above. We will not review it again.

The section on hammerstones has been expanded and will be reviewed in our report when we discuss the hammerstones LaPorta located but did not collect; we were able to collect many of them.

The section of this report that brings new information to this project is LaPorta's "Geological Reconnaissance of the Chapel Farm Estate Site and Surrounding Area." As the archaeologists had to struggle with the fact of a quartz workshop with no cortical debitage, LaPorta had to struggle with the fact of quartz veins where they had not been reported and were presumed not

to exist. In both cases, the evidence was hard at hand and the assumptions had to be challenged. This section of the report states this problem clearly and explores the geological literature. LaPorta finds that a few researchers had, indeed, noted the presence of quartz, but that it was left out of most descriptions of the Fordham Gneiss even though it is demonstrably present.

Drawing on the work of these few earlier observers and on work he has done regionally, LaPorta presents descriptions of the quartz and its contextual rock. He quotes a description from Balk in 1936 of quartz intrusion in the Hudson River Slate formation. This quartz is present as a result of infilling fractures caused by thrusting. The description of the jointing, cross-jointing and resulting step fractured quartz surfaces would fit many of the quartz outcrops found at Chapel Farm Estate, the Furman Estate and the Russian Embassy.

LaPorta also addresses the lack of recognition of the quartz in the literature. He concludes that the presence of abundant quartz was known but ignored; therefore, it became common geological wisdom that quartz was not present west of Cameron's Line, a geological demarcation which runs through the Bronx east of Van Cortlandt Park. In fact, vein quartz occurs west of Cameron's Line throughout the Hudson River Valley. It is one of several materials that filled in fractures in the country rock. LaPorta observes that the the veins run in patterns which should delineate a zone of thrusting within the Fordham Gneiss. In essence, there is a geologically predictable pattern to the distribution of quartz here.

La Porta provides a description of the quartz outcrops at Chapel Farm Estate. "Most of these veins have a NW-SE trend, possess cross joints, striations and foliations along the contact with the gneiss, and have a slabby or blocky outcrop appearance. The color ranges from clear white to gray-white to opaque white to pale pink." LaPorta concludes by mentioning the discoveries of more quarry sites in the Hudson River Valley based on the type of landscape and geological features found at Chapel Farm. These quarry sites have been located since the work at Chapel Farm by researchers who became familiar with the subtle signs in the landscape indicating the potential for quarry sites. Thus, Chapel Farm has served already to expand the knowledge about prehistoric resource exploitation. Chapel Farm Estate is not a unique site, according to LaPorta.

COMMENTS FROM SHEFFIELD ARCHAEOLOGICAL CONSULTANTS

LaPorta at the beginning of the section of the geological aspects of quartz at Chapel Farm expresses the desire to better understand the presence and distribution of this quartz which was clearly a resource for prehistoric peoples. He rectifies the neglect of the quartz by the geological literature and establishes a hypothesis for the origin of this quartz. The hypothesis, infilling of thrust fractures, provides a structure on which archaeologists can develop a field sense for the presence of quartz and the possibility of prehistoric exploitation of the material. In fact, he recounts several more projects at which he and the team which did this work were able to locate more quartz quarry complexes.

We do not disagree with LaPorta's sense of need to communicate what has been learned here beyond those familiar with Chapel Farm Estate. We do think that he and this particular team of researchers may underestimate the sensitivity of other professionals to this type of site. LaPorta's material is a welcome addition to the body of archaeological research, but the highly disturbed Chapel Farm Estate, where LaPorta and the research team failed to complete the field work necessary to establish the quarry complex parameters, is not a good prototype site for prehistoric quartz quarry organization.

We are still concerned that LaPorta's model for the organization of a prehistoric quartz quarry is being viewed too literally, rather than a predictive model drawn from prior experience. His sources are primarily his own observations and work done by Dunn, 1945; Powell 1965; Zern, no date; and Fowler, 1959. As the bibliography is missing from both this report and his Memorandum, we cannot comment here on whether or not this model is developed from all this research or from LaPorta's experience alone. Because the field work necessary to prove that this model exists at Chapel Farm was not done, we still question the enthusiastic identification of Chapel Farm as the first reported prehistoric quartz quarry and workshop complex in New York State.

We are concerned that too much effort has been given to proving the model and too little attention to describing what is actually left here at this site.

SUMMARY OF COMMENTS FROM SHEFFIELD ARCHAEOLOGICAL CONSULTANTS

We have already commented on the apparent lack of familiarity with current research demonstrated in the 1A. This extends to a lack of knowledge, prior to 1992, of LaPorta's work on quarries and lithic resources. We note that LaPorta presented a paper, "The Chert Quarries of the Wallkill River Valley," October 17, 1987 at the Fall Symposium of the Archaeological Society of New Jersey and, a second paper, "The Chert Quarries Within the Cambro-Ordovician Carbonates of the Wallkill River Valley of Northern New Jersey," at the April 1990 annual meeting of the New York State Archaeological Association. Program Chair, Edward J. Lenik, arranged for both of these presentations. In 1989, we consulted with LaPorta regarding a chert quarry in Warwick, Orange County, New York (see Lenik, DuPont and LaPorta 1989). Centennial Hill Farm, like Chapel Farm Estate, was a highly disturbed site in which only one part of the quarry complex, in this case two quarry sites, had survived.

It is unfortunate that the original research team at Chapel Farm Estates were unable to recognize the potential quartz lithic resources. Observations of the high concentration of quartz fragments, first noticed in the 1B investigation, should have prompted exploration of the site for either cobbles or outcrops. The site itself presents visible evidence of quartz resources. The workshop material would not have been mistaken as natural or historic by a lithic analyst who had worked with quartz collections. The need for greater familiarity with current research was clear in the Stage 1A; this would have broken the mindset that led to examination of slopes less than 15% only; a full project walkover would have led to the timely discovery of the hammerstones and the quartz outcrops. This knowledge of nearby quartz outcrops would have been invaluable in the ensuing discussion of where the quartz could have come from and how it came to be in the state in which it was found. LaPorta would have been a logical expert to turn to for help in interpreting the nature of the resources and the evidence of prehistoric resource exploitation; it would have been desirable to have his input much earlier in this study.

We believe it is likely that the original research team was not sufficiently

familiar with prehistoric quartz resources and as a result, the significance of the Chapel Farm Estates was inappropriately judged. LaPorta himself notes that Chapel farm is not unique. Robert Kuhn of New York State OPRHP informed Jean Howson that the site was register eligible based on the Revised Stage 2 report, but that it was not unique and that the entire site could be cleared for development (Guillet 1994: memo).

We agree with LaPorta that there is a lithic workshop site here and that it is quarry related. Our re-analysis of the lithic material recovered in the Stage 2 excavations supports this as we will discuss in the next section of this report. We also find it valuable to extract information from previous research and test field models to determine spatial patterns of prehistoric activity area. We do not feel that that this was done at Chapel Farm Estate. We have performed additional field work to test LaPorta's model. We feel very strongly that the conclusion that Chapel Farm Estate contains the identifiable pattern of this model and is, therefore, a Register eligible prehistoric quartz quarry complex, was most premature. We share Jean Howson's frustration.

II. ANALYSIS OF ARTIFACTS FROM THE STAGE II INVESTIGATION

A. Introduction

The lithic artifacts previously recovered from the Stage II investigations at Chapel Farm have been re-analyzed and re-catalogued in a manner appropriate to prehistoric lithic technology and the procurement and use of quartz as raw material for toolmaking. A glossary of terms, used in the following discussion, and the new inventory of artifacts are presented in the appendix of this report.

We note for the record that the artifacts recovered from excavation units 9 and A (see Kearns and Kirkorian 1993:25,26) were not received by Sheffield Archaeological Consultants. Efforts were made to secure these materials from the previous site investigators but without success.

NB

B. Artifact Analysis

A total of 3,960 artifacts were analyzed. The overwhelming majority of this total was quartz debitage or debris. One primary cortical flake of chert, one quartzite block flake, and one small piece of argillite shatter are also in the collection. The lithic assemblage is divided for analytical convenience into a number of classes such as tools, cores, preforms, flakes according to type, and shatter.

Nine stone tools are present in the collection including a spokeshave, a scraper-graver, three unifacial scrapers, a utilized flake-scraper, a projectile point tip, and two hammerstones (see Table 1; FIGURE 4).

240
of assemblage

TABLE 1: Analysis of Stone Tools Recovered During Stage II Investigations

Provenience T.U. No./Depth	Tool	Type	Material	Dimensions (mm)			Comments
				L.	W.	T.	
1: 0-10 cm.	scraper	spokeshave	quartz	66	52	19	
1: 20-30cm.	scraper-graver	end	quartz	31	34	8	
8: 0-10cm.	scraper	end and side	quartz	43	37	8	
10: 0-10cm.	scraper	utilized flake	quartz	28	26	10	
10: 10-20cm.	proj. point	tip	quartz	24	17	5	broken
S. W. Quad							
12: 0-10cm.	scraper	end	quartz	35	31	14	
N. E. Quad							
13: 0-10cm.	hammerstone	cobble	sandstone	77	70	44	
14: 20-30cm.	scraper	end	quartz	27	26	9	
Area 12: Surface	hammerstone	cobble	quartzite	100	65	62	

The spokeshave is a quartz flake with a unifacially retouched concave edge that was used as a tool for scraping or shaving of a convex surface. The width of the notch on this specimen is thirty millimeters, the depth is four millimeters and the edge angle is fifty degrees. Edgecrushing is present within the tool cavity.

Four formal scrapers were found at the site. Scrapers are defined as tools which were unifacially flaked for the specific purpose of being pulled or dragged across the material being worked at right angles to the cutting edge. These scrapers were deliberately manufactured in a purposeful manner and are characterized by low nearly uniform retouch on a segment of a flake. One of these specimens has a tip or spur at the top edge of its left lateral side which was probably used as a graver.

There is one utilized flake in the Stage II artifact collection. The function of this tool was determined to be that of a scraper on the basis of visible edge crushing. However, this class of tools may be under-represented in the collection. Recent use-wear experiments on quartz specimens have revealed the difficulty of detecting use wear damage. Pagoulatos (1992:92-93) reports that edge damage was not detected on specimens used for short durations or used on hides or wood. Use wear was found only on quartz specimens used for moderate and long durations and on hard material such as bone.

Two hammerstones were recovered from the site and their descriptions are indicated in Table 1. One specimen, of brown sandstone, is extensively battered and broken at one end. In addition, edge battering is visible elsewhere on the stone which resulted in the removal of small sections of

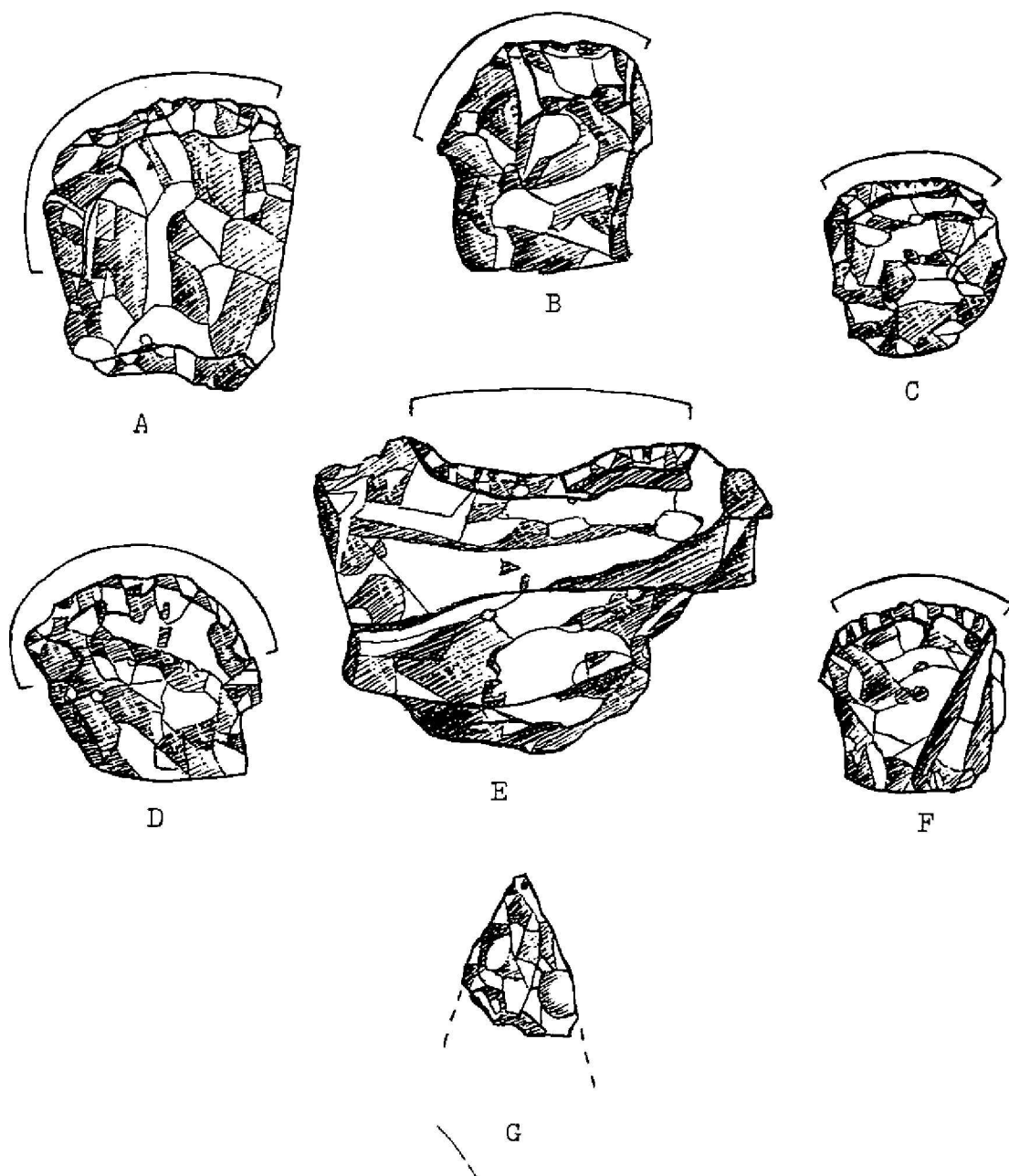


FIGURE 4: Quartz Tools from the Lithic Reduction Workshop Site. (Drawn by T. Fitzpatrick) Scale: 1:1.

A, End-side scraper; B & C, End scrapers; D, End scraper-graver; E, Spokeshave; F, Utilized flake scraper; G, Projectile point tip.

cobble cortex. The second specimen, a quartzite cobble, exhibits light to moderate battering at one end of the stone and along a small section of edge. These hammerstones were clearly used as percussion tools.

Twenty-two quartz cores are present in the collection. Eleven of these are block cores having striking platforms with one specimen showing evidence of grinding on its platform. Seven specimens are platform cores, two are cobble cores, one is a spheroid core, and one is a flake core. These data suggest that thick tabular quarry blocks were the predominate raw material utilized at this site. However, in two instances quartz cobbles were used as well.

One hundred and eighty-nine preforms were identified in the collection. Their attributes are indicated in Table 2.

TABLE 2: Analysis of Quartz Preforms

Stage of Mfg.	Knapping Technique		Total Frequency
	Bifacial/Percussion	Pressure Flaking	
Early	56	9	65
Early-Middle	2	2	4
Middle	45	49	94
Middle-Late	2	9	11
Late		15	15
Totals	105	84	189

The analysis of preforms indicates that the knappers were primarily producing early and middle stage biface preforms at the site and that percussion flaking was the principal technique employed. There are fifteen late stage preforms in the collection but no complete projectile points. One projectile point tip fragment was found in test unit 10. These data indicate that the final shaping of projectile points and other formal tools did not take place on this site. Instead, the preforms were carried elsewhere, to base camps, for curation and future processing into tools.

In our analysis of the preforms, we observed that most of these artifacts were generally triangular in shape at all stages of manufacture. This seems to suggest that the target tool type of the quartz knappers may have been the Squibnocket type triangular projectile point or perhaps other types of points

which have a triangular blade shape in outline (e.g. Wading River, Levanna). The Squibnocket Triangle projectile point type is a component of what archaeologist William A. Ritchie (1980:XIX-XX) defines as Small Stemmed Point cultures. The Small Stemmed Point tradition occurs in eastern New York and southern New England and dates to around 2200 B.C. (Ritchie 1980:XXI).

Triangular preforms of the Squibnocket type have also been found at the Primrose Site, a prehistoric lithic workshop located in the Town of Somers, Westchester County, New York. At this site, a cobble reduction workshop, twenty two percent of the lithic raw material recovered during data recovery excavations was quartz (Lenik 1990:42). In addition, stone tools produced from cobble quartz were recovered as well including a Squibnocket stemmed projectile point, a Sylvan Stemmed point, Sylvan Side-Notched points, biface fragments, utilized flakes-spokeshaves, and an end scraper (Lenik 1990:25-45). These and other data indicated that the Primrose Site was utilized as a workshop during the Late and Terminal Archaic Periods, c.2200 B.C. to 1000 B.C.

In summary, we note again that no complete projectile points were found at the Chapel Farm Site, nor any other type of temporally diagnostic artifacts. Therefore, although the lithic evidence seems to suggest a Late Archaic Period date for the site, such a conclusion must be considered as tentative.

Quartz debitage, the discarded by-product of stone tool manufacturing activities was abundant at the site. Analysis of the quartz assemblage included examining each specimen to identify the type of debris, sorting and counting by type, and measuring when appropriate. The purpose of these tasks was twofold: first to determine the quartz reduction sequence or stages of manufacture, and two to trace the distribution of debitage at the site. The analysis of debitage by type is summarized in TABLE 3.

The density of debitage varied from test unit to test unit. The highest concentrations occurred in test units 3, 9, 10 and 12. The spatial analysis of debris suggests the primary lithic reduction locus was near the center of the flat terrace (see Kearns and Kirkorian 1991: Maps 3 and 4). Test unit 15 at the northwest edge of the terrace and unit "B" on the south side were sterile. Test units A, C, 6 and 7 were outside the primary reduction locus and only very small amounts of debitage were recovered from these loci.

The analysis of debitage by type shows that primarily early lithic reduction processes took place at the site. The presence of 574 block flakes in the collection indicates core preparation efforts by prehistoric knappers and failed attempts to secure usable flakes and flake blades. Two hundred fifty-six unifacially edged blanks were identified that show some evidence of platform preparation in the form of unifacial edging but were rejected by the knapper for further reduction. This class of artifacts represents the initial stages of lithic reduction.

TABLE 3: Analysis of Debitage by Type

Type	Frequency
Block Flakes	574
Primary Cortical Flakes	44
Secondary Cortical Flakes	26
Tertiary Flakes	37
Bifacial Thinning Flakes	222
Pressure-Retouch Flakes	314
Unifacially Edged Blanks	256
Unifacially Edged Pebble	1
Flat Flakes	10
Notching Flakes	2
Quarry Blocks	4
Large Shatter > 20 cm.	131
Medium Shatter 10cm.-20cm.	297
Small Shatter < 10cm.	1,822
Total	3,740

→ 94.4%

C. Interpretation of Lithic Technology

The analysis of stone tools and debitage recovered during the Stage II excavations at the Chapel Farm lithic reduction site indicates that the primary activity was the production of early and middle stage biface/preform products (FIGURE 5). The raw material utilized consisted of large blocky chunks of quartz which varied in quality or grade. The lithic reduction strategy employed by the prehistoric knappers was based on the quality of the material and the nature of the initial blank. The evidence suggests that the knappers had a clear preference for material grade which manifested itself in the production of quartz preforms of milky translucence.

Most of the debitage was blocky angular chunks of waste which we characterize as block flakes and shatter. These reduction fragments or debris are the result of initial core preparation and trimming. Unifacially edged

blanks (flakes), the result of core reduction, are abundant in the collection. Partially trimmed or reduced cores are present as well.

The lithic data further indicate that both bifacial reduction and uniface production, i.e. prepared core flake-blade, strategies were used to produce tool preforms at the site. Thick pieces of tabular quartz were fashioned into prepared cores from which flake-blades were struck by direct percussion. These flake-blades were then bifacially reduced by percussion or pressure flaking depending on the thickness of the material. That is, percussion was used on relatively thick flakes and pressure flaking on thin.

Thin pieces of tabular or squared columnar quartz, which are present in the collection, entered the bifacial reduction sequence directly. Percussion flaking was the technique employed in reducing these forms of raw material. In all forms, the initial step was to produce a unifacially edged blank which would permit the knapper to evaluate the quality of the material and create a platform from which flakes could be struck to produce an early stage preform. The quartz reduction sequence employed at the Chapel Farm Site is summarized as follows:

STAGE 1: Obtaining Raw Material

STAGE 2 (A) Core Preparation

Material: Thick tabular quartz

Reduction Method: Percussion flaking

Product: Cores

Principal Debitage: Block flakes, primary and secondary cortical flakes.

2 (B) Blank Production

Material: Quartz cores

Reduction Method: Percussion flaking

Product: Thick and thin flake blades

Principal Debitage: Block flakes and secondary cortical flakes.

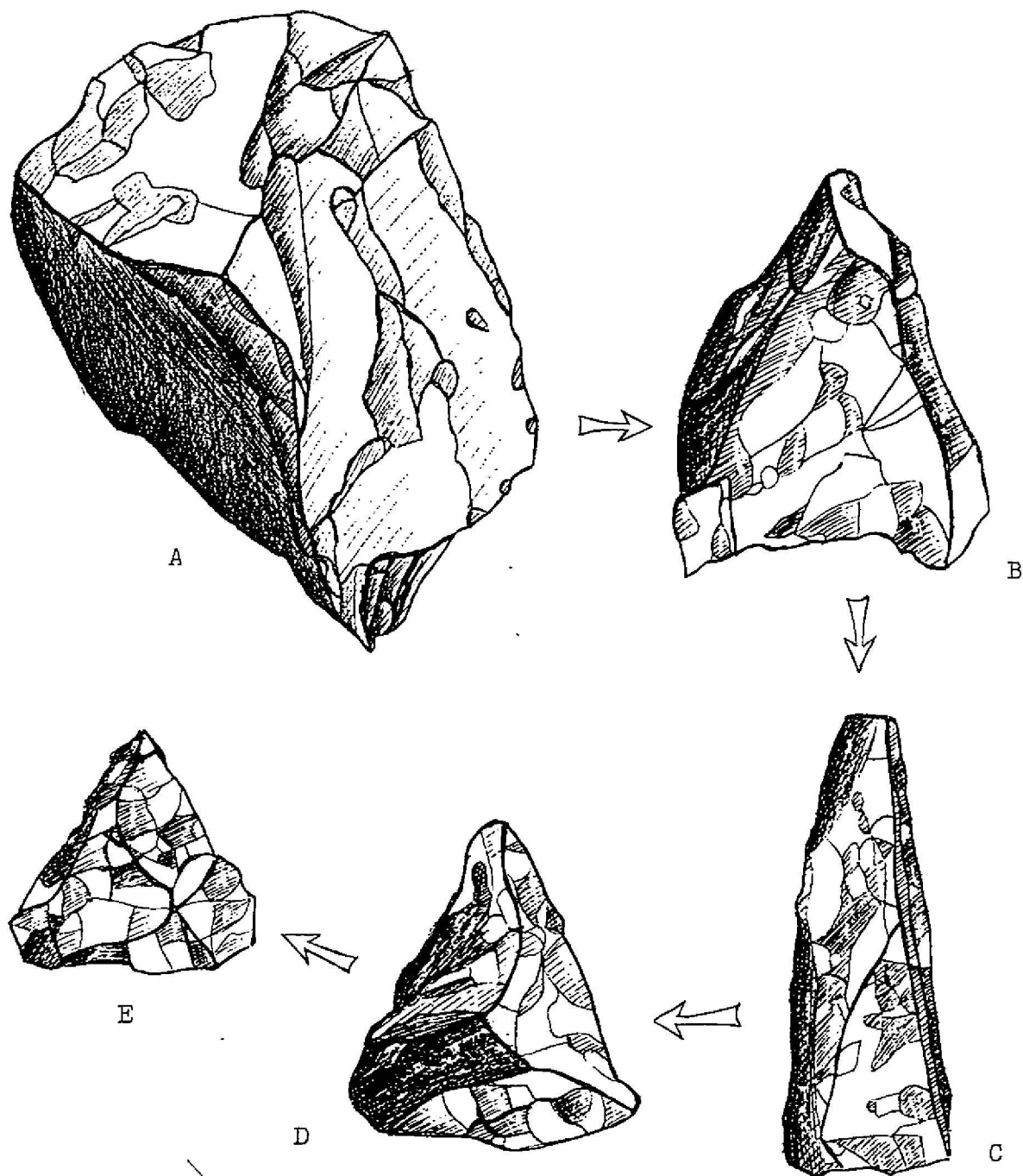


FIGURE 5: Example of Quartz Reduction Sequence at Chapel Farm Workshop Site. (Drawn by T. Fitzpatrick) Scale: 1:1. A, Block core; B, Unifacially edged flake blank; C, Early stage bifacial percussion preform; D, Middle stage bifacial percussion preform; E, Late stage preform.

2 (C) Initial Edging

Material: Thick flake blades, thin tabular and squared columnar blanks of quartz.

Reduction Method: Percussion flaking

Product: Unifacially edged blanks

Principal Debitage: Tertiary, flat and pressure-retouch flakes.

Stage 3: Thinning and Shaping

Material: Thick unifacially edged blanks

Initial Reduction: Percussion flaking

Product: Early stage bifacial preforms

Subsequent Reduction: Percussion flaking

Products: Middle and late stage bifacial preforms

Principal Debitage: Bifacial thinning and pressure-retouch flakes.

And/Or

Material: Thin flake blades of quartz or appropriate thindebitage from earlier stages of reduction

Reduction Method: Pressure flaking.

Products: Early, middle and late stage pressure preforms.

Principal Debitage: Pressure-retouch flakes.

Most of the quartz processing was by direct percussion techniques with hard hammers. However, only two cobble hammerstones with use-wear attributes were found at the site. It is likely that expedient cobble hammers were probably collected locally from glacial deposits of sand and gravel. However, "curated" or specialized lithic reduction hammers of both hard and soft materials could have been brought to the site to perform reduction activities.

In sum, the quartz assemblage from the Chapel Farm Site represents evidence of a prehistoric lithic reduction workshop.

D. Concluding Observations

Some limited comparisons can be made with other quartz reduction sites in the mid-Atlantic and eastern region. For example, archaeologist and lithic technologist Jack Cresson investigated a quartz quarry extraction and processing site near Langhorn, Bucks County, Pennsylvania (Cresson 1994, personal communication). Cresson reports the presence of two concentra-

tions of large blocky chunks of mineral/vein quartz at the Langhorn Site at which the primary activity was the procurement of flake blanks and early stage biface products by biface and uniface production systems. This, of course, is similar to the lithic technology employed at the Chapel Farm Site.

Cresson's observations at the Langhorn Site are interesting vis-a-vis Chapel Farm. He states that "a mantle of very dense debitage covered the ground (and was) so dense that the ground surface color was obscured by so much quartz debris that it looked like a patch of snow" (Cresson 1994, personal communication). Cresson further states that the early stage processing of quarried material is "markedly" different from that employed in pebble technologies. However, the later stage activities which includes the production of early to late stage bifaces are very similar and thus the source of the raw material, whether from cobble or quarry, cannot be distinguished.

A search of the literature pertaining to prehistoric quarry-workshops indicates that two quartz reduction sites have been found in Maryland. Geasy and Ballweber (1991:85-88) report that "locally available quartz is present in blocks and chunks" at the Chase Site in Frederick County. The Chase Site was primarily a rhyolite workshop where bifaces were being produced. However Geasy and Ballweber state that the use of quartz at this site by prehistoric knappers was "opportunistic." They report that twenty three quartz bifaces, one triangular and one stemmed projectile points were found at the Chase Site. These researchers also report that the nearby Mullinix Site "contained natural quartz blocks which had been utilized by this site's knappers; six quartz bifaces were found here (Geasy and Ballweber 1991:99,102).

III. FIELD RECONNAISSANCE AND ARCHAEOLOGICAL TESTING

The field work of this project was conducted in April 1994 and consisted of an intensive pedestrian survey, the collection of prehistoric artifacts and subsurface test excavations. The locations of the quarry investigation sites (QIS), archaeological tests and surface collected artifact loci, are indicated on the project base map which is to be found at the end of this report (FIGURE 7). The numbering system for the quarry investigation sites follows that of the previous investigator and is utilized in the narrative below. The numbering system corresponds to the location of these sites on the project base map.

A. Field Survey

An intensive pedestrian survey was conducted of the entire project area. All features, both natural and cultural were carefully examined in order to provide data for assessing the previous investigation results and the proposed construction and its impact. The field conditions during the time of this study were good, i.e., site visibility was good in wooded and open areas so that exposed features could be detected. However, ground surface visibility was poor due to heavy fallen leaf cover, ivy, and other floral species. Prehistoric artifacts discovered on the surface of the ground within the study area were collected and their locations plotted on the topographic survey map. Their locations are described and indicated by Lot Number and exact position on the landscape.

Historic and Current Land Use

The documentary evidence and our field reconnaissance indicate that a substantial portion of the study area has undergone a number of landscape modifications in historic times. These changes would have had a direct impact on the preservation or integrity of any prehistoric resources that may have

existed within the property. The obvious physical evidence of such modifications includes the following.

1. An existing two-story residence located within Lot No. 14. A paved roadway and cul-de-sac, retaining wall and other structural features adjacent to the northwest corner of the house. The surrounding area has been extensively landscaped.
2. The foundations of 20th century cottages are present throughout the property. Landscapes around these structural features have been disturbed.
3. A road enters the property from the end of Goodridge Avenue, then turns westerly and continues across the south end of the property and exits near the intersection of W. 253rd Street and Iselin Avenue. A stone retaining wall extends along a portion of the roadway.
4. A large area of dumping is present near the Goodridge Avenue entrance to the property. The dump measures approximately 300 feet by 100 feet and consists of "dump load" mounds of earth, construction debris, wood and other assorted materials.
5. Building debris is widely scattered throughout the property but is particularly evident within Lots Numbered 1, 6, 7, 8, and along the roadway described above.
6. A water line extends northwest to southeast through the Lithic Reduction Workshop Site located within Lot No. 5.
7. A drystone wall containing cut blocks extends north-northwest to south-southeast along the edge of a terrace in Lots 3 and 4.
8. A drystone wall extends northeast to southwest through the south end of Lot No. 1.
9. Several machine-made test holes are present in various locations.
10. Cut granite-gneiss blocks of stone are scattered throughout the property.

Examination of Previously Reported Quarry Investigation Sites (QIS):

QIS 1:

Located within Lot No. 11 at the eastern side of the property. This site was described as a "quartz outcrop associated with quarrying activity" (Kearns and Kirkorian 1993:5). A "beaked wedged shaped pounding stone" was reported as being present "on the ground surface in direct association with a small quartz vein outcrop" (Ibid:6). A photograph of this quarry site and artifact was included in the 1993 survey report and is identified in appendix E of their report as "Photo QIS 1."

Based on the reported location of this site (Kearns and Kirkorian 1993:Map 6) and the photograph, we relocated this site. This site is an outcrop of bedrock; no quartz was present at this specific locus. The reported "beaked wedged shaped pounding stone" was present at the site and was collected by the principal investigator of this current study. Our analysis of this specimen indicates that it is a spall or fractured piece of gneiss; no evidence of use-wear is present. We conclude that it is a natural piece of rock and not a tool. Furthermore, this rock specimen does not match the description of such quarry tools as defined by LaPorta (1993:6, Photo 15). La Porta describes these hammerstones as "quartzite" tools weighing between 15 and 20 pounds.

QIS 2:

Kearns and Kirkorian (1993:6; Photo QIS 2) describe this locus as a "sterile quartz vein outcrop," located within Lot No. 11.

Our analysis of this reported site is that it is not an "outcrop." It is instead a large quartz block that is lying on the surface of the ground some nine feet downslope from an outcrop of bedrock at the eastern end of the property. The quartz block measures three feet by two feet by one foot. We conclude that it is not in its original natural setting.

A hammerstone fragment was found on the surface of the ground ten feet to the east and downslope from the quartz block described above. The location of this find is indicated as Tool Locus #3 on the project base map. This specimen is a split quartzite cobble that measures 110mm X 90mm X 42mm. Use-wear is indicated by the presence of battering on its surface. We conclude

that it is a tool, but was not in its original activity or use area as it was found on a steeply sloping hillside.

QIS 3:

This site is located within Lot No. 11 near the eastern edge of the property. No description is given of this site, however, a photograph taken by the previous investigators suggests that it is a boulder lying on the surface of the ground (see Kearns and Kirkorian 1993: Appendix E, Photo QIS 3).

We located and examine this feature. It is a granite-gneiss boulder that measures two and one-half feet by two feet by one and one-half feet. It is partially split on its easterly side and is iron mineral stained on its surface. It is not quartz, nor was there any quartz nearby. This granite-gneiss boulder shows no evidence of having been worked.

QIS 4:

This site also lies within Lot No. 11. It is described as a sterile quartz vein outcrop and was photographed by the previous investigators (Kearns and Kirkorian 1993:6; Appendix E, Photo QIS 4).

We relocated and examined this site during our field reconnaissance. It is not a quartz vein outcrop. It is instead a quarried block of gneiss with quartz inclusions. This cut block measures two and one-half feet by one foot by one foot. It is part of a stone retaining wall which dates to the historic period. The immediate area has been landscaped and day lilies are presently growing adjacent to the stone block.

QIS 5:

This site is described as a quartz outcrop associated with quarrying activity. This site was photographed and its caption reads "Note possible hammerstone used to support quartz block. This is presumably the work of gardeners rather than prehistoric peoples" (Kearns and Kirkorian 1993: Appendix E, Photo QIS 5).

We conclude that this site is not an "outcrop" but a gneiss boulder lying adjacent to bedrock. It is not a quartz block. There is a retaining wall immediately to the north of the stone. We agree that this area has been landscaped.

The "possible hammerstone" supporting the stone was removed and examined. It is a quartz cobble hammerstone fragment that measures 118mm

X 110mm X 83mm. It exhibits some evidence of use-wear in the form of battering along its edge. It is clearly not in its original activity or use area. It was probably removed from its initial deposition locus by the historic landscaping work.

QIS 6:

This site is situated within Lot No. 8 just to the west of the road entering the property from Goodridge Avenue. It is identified as a sterile quartz vein outcrop (Kearns and Kirkorian 1993:5; Photo QIS 6). LaPorta (1993: Photo 21), on the other hand, identifies the same vein as pegmatite.

We examined this reported site but found no evidence of quartz present in the bedrock outcrop.

QIS 7:

This site is situated in the area between Lots Numbered 6 and 12. It is described as a quartz vein outcrop and as a quarry site (Kearns and Kirkorian 1993:6; Appendix E, Photo QIS 7).

We examined this site by clearing away surface debris, leaves and brush. We conclude that it is a quartz vein outcrop with contiguous in place natural quartz blocks at and just below the surface of the ground. The quartz vein lies within an ivy covered disturbed area. A structure was formerly located adjacent to the site. Construction debris is present on the ground surface nearby including red bricks, pipe, lumber, and asphalt shingles. There is no evidence of quarrying activity in this area nor of any other lithic reduction functions.

QIS 8:

This locus was described as a quartz block incorporated into a retaining wall at the southern end of the property (Kearns and Kirkorian 1993:5). We found this feature and observed that the block's location was incorrectly mapped by the previous investigators. It is situated within Lot No. 7 and is part of a low retaining wall on the north side of the road.

QIS 9:

Quarry Investigation Site 9 is located within Lot 14 near the northwest corner of the Manor House. It is described as a quartz vein outcrop associated with quarrying activity (Kearns and Kirkorian 1993: 5,6). A photograph of this

feature, Photo QIS 9, shows a "possible hammerstone" lying within the quartz vein.

The quartz vein is sixteen feet from the house. It extends for a distance of nine feet nine inches parallel to the west wall and is nine inches thick. It appears that some quartz was removed from the vein at its northerly end. However, it is not possible to determine when or by who this work was accomplished. The reported hammerstone was not found nor did we find any other tools or quarry debris.

This site is highly disturbed. The construction of the house, adjacent retaining wall and nearby sewer line have significantly impacted this area. Furthermore, the area has been landscaped, a walk built nearby, and the ground surface is littered with construction debris.

QIS 10:

This reported investigation locus was "not directly associated with a distinct quartz vein outcrop" (Kearns and Kirkorian 1993:5). It was instead a shovel test pit excavated near the "face of a possible rockshelter" that turned out to be sterile.

This site is located within Lot 14, to the east and below the manor house. The bedrock outcrop is not a rockshelter in the formal sense of this term. That is, it is not an overhanging rock edge or outcrop which would have provided shelter from the elements for human groups.

The area surrounding the rock outcrop is wooded and the ground surface is covered with leaves. Some dumping has taken place uphill and to the west of the outcrop along the east side of the house. There are four machine made test holes located approximately twenty five feet from the rock outcrop. We examined these open pits and backfill piles but no cultural material was found. In sum, no quartz or evidence of prehistoric quarrying activity was found in this area.

QIS 11:

Two "free-standing quartz blocks are present on the lawn within Lot No. 12, southeast of the mansion house. Each block reportedly weighs "several hundred pounds" and their composition was described as "consistent with the quartz debitage recovered from the Stage II Lithic Reduction Site (Kearns and Kirkorian 1993: Photo QIS 11).

We are inclined to characterize these items as worked quartz boulders rather than blocks. One boulder measures four feet three inches in length, one foot nine inches in width and two feet in height. It has a smooth cortical surface on one side and appears to have been worked on other surfaces. The second quartz boulder measures three feet two inches in length, two feet eleven inches in width and one foot ten inches in height. This boulder has two smooth cortical surfaces and shows evidence of having been recently worked.

We agree that the two quartz boulders were used as decorative landscape elements. They appear to have been placed in-line adjacent to and east of an outcrop of bedrock. An octagonal concrete gazebo base is located twelve and one-half feet to the east of these boulders.

QIS 12:

The previous investigators reported finding a "concentration of large quartz blocks" adjacent to the remains of a twentieth century cottage. These quartz blocks were part of a "stepping-stone walkway" (Kearns and Kirkorian 1993:5; Photo QIS 12). These investigators speculate that the quartz blocks "possibly represent the tailings or initial reduction in a quarrying process" but were "displaced from an original reduction process area" (Ibid:5). Their presence in the walkway indicates use as decorative landscape elements and confirms their findings of site disturbance.

This site is located at the western end of building Lot No. 12. We agree that the quartz blocks were utilized as landscape-structural elements placed here in historic times, and that the surrounding area is highly disturbed. However, we do not accept the opinion that the quartz blocks are the remains of a tailings pile of a quarry. We found no evidence to support such speculation. In our opinion, a historic period walkway lined with quartz blocks does not meet the definition of a "tailings pile." A tailings pile, in mining-quarrying parlance, means pieces of rock refuse containing little or no ore that have been separated from the original ore deposit.

New (1994) Quartz Deposit and Artifact Finds:

QIS 13:

A quartz vein was discovered by the Sheffield Archaeological Consultants

field team within an outcrop of bedrock at the edge of a terrace at the eastern end of Lot 11. This quartz vein lies between the previously reported QIS sites 1 and 2. We have assigned it a new identification number as it was not described in the previous reports.

The quartz vein was revealed by an uprooted tree. It is a quartz block in country rock and measures 2'6" X 1'3" X 9". There are two loose blocks on the surface that were dislodged from their original matrix by the tree fall. Another quartz block, nine inches in length is present in the tree roots, and two pieces of quartz shatter were on the surface. We conclude that the quartz vein in this location was fractured by natural rather than human processes.

QIS 14:

A quartz vein was found by the Sheffield Archaeological Consultants field team on the west side of the property within building Lot No. 4. This vein is situated on a rocky sloping hillside approximately 100 feet southwest of the Quartz Reduction Workshop Site. It is a small vein that measures one and one-half feet in length and is two and one-quarter inches thick. There is a gap in the bedrock at the western end of the vein which suggests that some quartz has been removed. We found no evidence of battering on the surface of the country rock and no quartz shatter or tailings.

Two hammerstones were found on the surface of the ground some fifteen feet south of the quartz vein described above. We have labeled this find spot as Tool Locus No. 1 and indicate its location on the project base map. One specimen is a "beaked" hammerstone that measures 126mm X 80mm X 70mm. It is a diabase cobble that has a battered tip. The second specimen is a broken quartzite cobble that shows evidence of use; battering scars are present on the stone. It is unlikely that these tools are in their original point of deposition or use.

QIS 15:

A quartz vein was located at the southern end of the property by the Sheffield Archaeological Consultants field team within building Lot No. 7. The quartz vein lies near the base of a rock outcrop just north of the present roadway. The quartz vein measures two feet in length and ten inches in width. No evidence of quarrying activity was observed and no prehistoric artifacts were found on the surface at this location.

The landscape to the south and west of the quartz vein is highly disturbed. There is a pile of earth and brick fragments adjacent to the south side of the vein. Also, a stone foundation is present twenty-one feet west of the quartz vein and building debris is scattered throughout the area.

Quartz Debitage Locus A:

A small unworked white quartz cobble was found on the surface of the ground within Lot No. 2. It is a natural quartz specimen and its find spot is indicated on the project base map.

Quartz Debitage Locus B

Two pieces of quartz were found on the top surface of rock outcrop located within Lot No. 2 at the southwestern end of the property. One specimen is a quartz block that measures 140mm X 75mm X 65mm. The second specimen is quartz shatter and measures 116 X 56mm X 48mm. Both specimens appear to have been deliberately placed on the bedrock surface. The reason for this is not evident, but it does indicate that the quartz pieces are not in their original context.

Tool Locus No. 2

A small pile of stones was found on the top surface of an outcrop of bedrock located within building Lot No. 4. The appearance and placement of these stones suggests that an attempt was made at landscape clearing and that the stones were picked up and placed on the rock outcrop, probably in historic times. This locus is fifty two feet south of the quartz vein (QIS 14) described above.

Four stone tools of prehistoric origin were found within the pile of stones. Specimen number one is a quartzite cobble hammerstone that measures 86mm X 80mm X 45mm. Extensive battering is evident at one end. Specimen number two is a weathered granite cobble that measures 93mm X 84mm X 60mm and also has evidence of edge battering. Specimen number three is a flat quartz cobble, 176mm X 126mm X 53mm with extensive use-wear evident at one end. The function of specimen number four is difficult to ascertain as it is a broken, spalled and battered block of granite. It may have been used as a percussion tool or as an anvil in lithic reduction activities.

Quartz Reduction Workshop Site:

Twenty two specimens of quartz were found on the surface within the previously excavated quartz reduction workshop. This new collection consists of twelve pieces of small shatter, five block flakes, three bifacial thinning flakes, one pressure-retouch flake and one pebble hammerstone. The hammerstone is granite, measures 48mm X 48mm X 23mm and is battered at one end. This surface collection is consistent with the material recovered during the Stage 1B and II excavations.

B. ARCHAEOLOGICAL TEST EXCAVATIONS

Twenty-five (25) shovel tests were excavated within the study area during this 1994 investigation. The location and description of each test and the artifacts recovered are listed in the appendix of this report.

Test Unit 1 was three feet by three feet in plan and was excavated adjacent to the previously reported QIS 5. Stratum I of this test was a very dark brown silty sandy loam that extended to a depth of four inches below the surface. A rim fragment of a whiteware ceramic cup and a bottle fragment were recovered from this soil layer. Soil stratum II, from four inches to nine inches in depth was a very dark brown silty sandy loam containing small rocks. Two pieces of coal were found in this soil layer. Stratum III extended to a depth of twenty six inches and was a sterile dark yellowish brown silty sand layer. No prehistoric features or artifacts were found.

Two shovel test pits, numbers 2 and 4 were excavated within Lot No. 10 to the east of QIS 5; they measured one foot by one foot in plan. Two soil layers were encountered in STP 2, a dark brown sandy loam that extended to a depth of three inches and a dark yellowish brown silty sandy clay that was excavated to a depth of twenty-two inches. Two pieces of coal were found within stratum I, and stratum II was sterile. Three soil layers were encountered in STP 4. Stratum I, from surface to three inches, was very dark brown silty sandy loam. Stratum II, from three inches to eight inches in depth was dark brown silty sandy clay. Stratum III was a strong brown silty clay that extended to a depth of twenty seven inches. No artifacts or features were found within this test.

Seven shovel tests were excavated within Lot No. 11 in search of subsur-

had was surface
collecting done?
- do not appear
to be systematic (entire area)
but more focused
previously identified
QIS sites - this is not
what was requested
(also see p. 41)

why were STP's
placed where
they were
- i.e., what
was
sampling
strategy?

face evidence of prehistoric quarrying or lithic reduction activities. These shovel tests measured one foot by one foot in plan and were excavated to culturally sterile depths. STP's 6, 7 and 10 were sterile; no artifacts or features were found. One piece of anthracite coal was recovered from the upper loam layer in each of shovel test pits 3, 5, and 8. One fragment of window glass was recovered from stratum I, a very dark brown silty sandy loam, of shovel test pit 9. Shovel test pit number 10 was excavated adjacent to the quartz vein identified as QIS 13, but no quartz material or tools were found. In sum, no prehistoric artifacts or features were found within these shovel tests.

A three feet by three feet test, STP 11, was excavated within Lot No. 6 south-southwest of QIS 7 which was previously described as a quarry site. The purpose of this test was to find evidence of quartz quarrying or reduction activity. Stratum I of STP 11 was a very dark grayish brown silty loam that extended to a depth of eight inches below the surface. A beer bottle fragment was found within this layer. Stratum II, from eight to eighteen inches in depth was dark grayish brown sandy silt and sterile. Stratum III was strong brown sandy silty clay that extended to a depth of twenty-five inches at which point bedrock was encountered. This layer was also sterile.

Three additional tests, STP's 12, 13, and 14 were excavated within Lot 6 south-southwest of STP 11. No artifacts or features were found within STP's 12 and 14. However, stratum I of STP 13 was disturbed and contained many fragments of brick and coal.

STP 15 was excavated adjacent to the quartz vein identified as QIS 7. A one inch layer of very dark grayish brown silty loam overlay the bedrock. No quartz shatter, tailings, or prehistoric artifacts were found.

Three tests, STP's 16, 17, 18, were excavated within Lot No. 12 to the north of QIS 12, the stone walk containing quartz blocks. These tests were dug in a flat level area that was below the alleged quarry (QIS 7) and tailings pile (QIS 12). No quartz material or evidence of lithic reduction activity was found. One piece of anthracite coal was found in STP 16, stratum II.

A shovel test, number 19, was excavated at the foot of the newly discovered quartz vein designated as QIS 14 in Lot No. 4. Only one stratum of soil was encountered in this test, a black silty loam that was five inches deep and terminated on bedrock. No evidence of quarrying or lithic reduction was found. Two additional tests, STP's 20 and 21 were dug at points west,

southwest, and downslope from the quartz vein, also within Lot No. 4. STP 20 was sterile. In STP 21, we found two pieces of anthracite coal and a fragment of thick green glass within stratum I, a very dark brown sandy loam that extended to a depth of five inches. Stratum II of STP 21 extended from five to twelve inches in depth and contained a flower pot fragment. Bedrock was encountered at the bottom of this test.

Shovel test pit 22 was excavated at a point twenty feet up the hillside from the newly discovered quartz vein designated as QIS 15. No artifacts or features were found within this test. STP 23 was excavated at the foot of the quartz vein. Two bottle fragments which date to the late 19th century were found within stratum I, a black silty loam layer. No evidence of quarrying or lithic reduction activity was found.

Two shovel tests, STP's 24 and 25 were excavated downslope from the quartz vein (QIS 15) in a flat area within Lot No. 1. No prehistoric artifacts, or features were found within these tests. No quartz debris was present in this area.

IV. CONCLUSIONS AND RECOMMENDATIONS

Let us begin with a comment from Kearns and Kirkorian (1991:i) from the original Stage 2 report. "The age, cultural affiliation, type and duration of occupation at this site was not determined during Stage 1 or 2 and will not be determined through additional work due to extensive disturbance."

With one exception, we agree with Kearns and Kirkorian. Our exception is that our re-analysis of the material recovered during Kearns and Kirkorian's Stage 2 workshop excavations clearly determines the TYPE of occupation at this site. This was a lithic workshop at which quarried quartz was reduced to blanks suitable to be further worked into tools. We have offered an observation as to the nature of these blanks and their similarity to material we previously analyzed at the Primrose Site in Somers, New York, but we do not feel this similarity is reason enough to assign a cultural affiliation.

Suggestion was made in earlier investigations that the workshop material might be natural or historic. Principal Investigator, Edward J. Lenik, examined the material with the assistance of a staff member who has done extensive experimental lithic technology. The material reveals a process of lithic reduction.

The extensive disturbance of the site prevents us from determining that the workshop is part of a quartz quarrying complex. We conclude that the majority of the quartz worked at Chapel Farm was quarried, but the site is too disturbed to permit identification of other quarry complex features.

Jack Cresson, in discussing the quartz quarry complex he dealt with in Pennsylvania, observes that quarried quartz and cobble quartz go through different initial processing after procurement; quarried quartz is relieved of its matrix in the tailings pile and broken into portable, workable chunks near the quarry site (Cresson 1994); this is a more informal observation than LaPorta's model which places each work area within specific directions and distances from each other. The principle is the same, however, material is wrestled away from the quarry face, falls to the area below the quarry, is moved away from the dangerous zone of quarry fall to an area nearby where the waste material can be removed and the good stuff broken up into portable

pieces; these pieces are then worked into blanks at the workshop site. Cobble quartz is the equivalent of these portable pieces. It, too, is worked at a workshop site into usable blanks. A cobble quartz workshop can be distinguished from a quarried quartz workshop by the presence at the cobble site of much debitage with cortex present such as is present in the Primrose site assemblage. A quarried quartz workshop site will have little cortex present on the debitage; quarried quartz can have cortex in those areas of an outcrop which have been exposed to glaciation and other weathering, but much of this will have been removed at the tailing and ore reduction sites. We are, therefore, in agreement with LaPorta's identification of the workshop site as a quarried quartz workshop. The puzzling attribute — lack of cortical debitage — is typical of quarried quartz workshops.

The final workshop products — the blanks — are indistinguishable as to quarry or cobble origin as are the final tools. This is the second part of Cresson's observation from Pennsylvania. You cannot tell from the finished tool what form of raw quartz the knapper began with. For this reason, we have not pursued the question of trying to establish that quartz tools found in middens and other sites in the Bronx came from Chapel Farm. We would not be able to do anything other than comment on the similarities or differences of color and clarity. This route, then, of trying to establish cultural affiliations for the workshop, is thwarted by the nature of the material. Quartz does not appear in the range of color and pattern that LaPorta has used successfully to tie chert outcroppings to finished tools.

We have noted above that LaPorta presents a rather formal model of quartz quarry complexes while Cresson describes a similar, but informal, layout for the quartz quarry with which he is familiar. We field tested LaPorta's model at Chapel Farm.

First, we located the twelve QIS sites identified by LaPorta, Guillet, Kearns and Kirkorian and listed in the Revised Stage 2 report. The descriptions were inadequate, so we carried photocopies of their photographs out into the field and were able to match the sites to the pictures. As discussed in the fieldwork section of this report, many of these sites were not what they were described to be. We dug tests at each of the sites which the previous investigators indicated were possible quarry related features. We found no quartz shatter, debitage, tailings, etc. or any other signs that these sites were in any way part

What about
sources?

of a quarry complex. Many of these sites — the cottage walk, the terraced gardens, etc. — were highly disturbed by landscaping activities.

We extracted LaPorta's tentative identification of the parts of the quarry complex — QIS 7 as the quarry, QIS 12 as the tailings pile — and mapped his directions as to where the ore reduction site should be. This area between QIS 12 and the workshop had been shovel tested in Stage 1B; no quartz was found in this area in those tests. We ran a new series of tests with similar results — no quartz shatter, trimmings, tailing — no quartz. We also noted that QIS 7, QIS 12 and much of the area in question were very disturbed because of the cottage foundation and gardens located here. If the Chapel Farm Estates quarry complex fit LaPorta's model where he said it should be, all evidence is gone or rearranged so as to be of no diagnostic use.

We noted that our field reconnaissance work located quartz outcrops within the project area which were not located by the previous investigators. The outcrops they identified were to the east of the workshop site. We located outcrops to the south and west. We tested these additional outcrop sites for evidence of quarrying and tried LaPorta's model with the hypotheses that each of these could have been the quarry. No evidence was found supporting these hypotheses. Again, we were hampered by the highly disturbed nature of the project area.

LaPorta also located offsite outcrops to the east and west and we found off site outcrops at Van Cortlandt Park to the east. All outcrops located, both on and off site, showed a variety of colors ranging from gray through white to pink and orange. The material at the workshop is predominantly white, with some gray and orange to pink tones and inclusions. The similarity we find between the workshop material and quartz outcrops nearby, but off site, does not permit us to exclude off site outcrops as the source of the workshop material.

We recommend no additional work at this site. We find the site too highly disturbed to be register eligible. Much might have been learned here prior to the building of first the Goodridge estate and then the Order of the Living Christ.

The site has opened up a new view of lithic resources in this area. Beyond a doubt, prehistoric people quarried quartz in the Bronx. LaPorta identified several apparently undisturbed quarry sites near Chapel Farm. We were

directed to two sizeable quartz outcrops in Van Cortlandt Park which may have been quarried in prehistoric times. These outcrops are open to public view and give mute evidence of the presence of quartz in the Bronx. NB

Finally, we would like to comment on the difficulties of identifying quarried sites. LaPorta looks for three signs — hammerstones, both whole and broken, lacerated or hacked outcrop surfaces and quartz shatter. He also speaks of exhausted veins off site where shatter and hammerstones indicate quarrying. We are less quick to call something a hammerstone as our discussion of some of those he identified should indicate; we look for use-wear. At Chapel Farm, we identified an undisturbed, that is to say unlandscaped, quartz outcrop near several QIS sites. Here we found loose blocks similar to those incorporated into the cottage walk. We also found a block in situ, a part of the outcrop fractured but not dislodged. In the roots of a nearby upturned tree we found chunks of quartz and in the soil around the outcrop a scattering of quartz shatter. Nothing present in this scene was identifiable as human caused. Yes, prehistoric peoples or Mrs. Griscom's gardeners could have used the natural jointing of the quartz to dislodge this material, but natural forces could have done it as well. Q 13
Q 14

Quartz quarries are certainly worth looking for, but some caution must be exercised or every weathered outcrop will be labelled a quarry. We appreciate LaPorta's attempt to develop a model for prehistoric quarries and would like to see it tested on an undisturbed site. Chapel Farm Estates is too highly disturbed to be the typesite for quartz quarry complex spatial design.

We recommend that the Stage 2 assemblage of materials and a copy of our analysis of artifacts from the Stage 2 excavations be placed as a study collection with an institution actively pursuing the archaeological record in the Bronx. We were able to place the Primrose Site collection with MALFA in Westchester County where we know it has been used to teach interested parties what to look for in worked quartz. The Chapel Farm collection should be made similarly available.

V. REFERENCES

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VI. APPENDICES

Appendix 1: Glossary of Terms

**Appendix 2: Inventory of Lithic Collection from Stage II
Investigation**

Appendix 3: Test Excavation Records: 1994

Appendix 4: Artifact Inventory 1994

Appendix 5: Project Personnel

APPENDIX 1

GLOSSARY OF TERMS

This glossary is intended to be a reference for lithic technology terms that are used in this report. The stages of lithic reduction, typology or form of cores and other definitions follow those described by Callahan (1979;1987). The latter reference specifically deals with lithic reduction experiments with quartz and quartzite. Also, much of the quartz debitage is classified by type following definitions established by Barber (1981:54,56) or more generally those developed in experimental knapping operations (Shea 1985:44-49).

ANVIL STONE: A cobble, block of stone, slab, or bedrock surface which exhibits irregular but concentrated nicks or pits. The nicks and pits were produced by percussion.

BIFACE: This class of artifacts represents pieces of stone that have been FLAKED ON BOTH SIDES, and whose specific function cannot be ascertained.

BLANK: Lithic material of any form (debitage, flat tabular blade, squared or columnar) that has the potential to enter the bifacial reduction sequence.

COBBLE: A roundish stone of variable size. Different raw material types were utilized for the manufacture of flaked artifacts, and as percussors.

CORES: Stones from which pieces have been flaked off to make artifacts.

Platform Core: core with flat platform from which flakes have been struck by percussion.

Anvil Platform Core: Same as above except that crushing is present on the base of the core.

Bipolar Core: Core worked by splitting and resplitting of a block, cobble, or pebble which is held against an anvil stone. The impact of the hammerstone is straight with the force oriented directly *into* the anvil. Crushing occurs directly beneath the end of the flake scars.

Biface Core:

(a.k.a. chopper-like

freehand core) A relatively thin bifacially worked piece, chopper-like in appearance. If the piece is thick and has been worked against an anvil it will exhibit crushing and is referred to as a "chopper-like anvil core."

Block Core: A squarish, cylindrical, or polyhedral core having a striking platform.

Cobble Core: A roundish stone with cortex remaining, and flake scars evident. Striking platform may also be evident.

Spheroid Core: A multi-faceted, globular, or polyhedral core having more than two striking platforms.

Flake Core: A large detached flake usually wider than long, or roundish, with a variable striking platform.

CHISELS:

Small, blunt, somewhat flat stones used to focus blows from a larger hammerstone or stone maul. Exhibit evidence of spalling and battering at opposite ends.

CORTEX:

The weathered, smooth exterior surface of lithic material. For example, a vein or water worn cobble.

DEBITAGE/DEBRIS: The discarded byproduct of stone tool manufactur-

ing and/or refurbishing activities; frequently referred to as waste flakes. We note however, that some debitage may have the potential of being manufactured into tools or used to perform expedient functions (e.g. utilized flake-scrappers).

Flat Flake: A large flake, greater than 20mm long removed with a hammer. It is thin, has generally parallel faces and often exhibits a bulb of percussion.

Block Flake: Thick, chunky flake with no evidence of bulb of percussion.

Bifacial Thinning Flake: Thin, flat, small flakes, less than 20mm long. Arise present on dorsal surface.

Unifacially Edged Blanks: Flakes showing evidence of initial stages of lithic reduction including some platform preparation and/or unifacial edging.

Pressure or Retouch Flake: Tiny or very small flake, less than 10mm long with flat or convex cross-sections.

Primary Cortical Flake: Flakes with more than 50% of cortex remaining on their dorsal surface.

Secondary Cortical Flake: Usually wide and long flakes, thick in cross-section. Less than 50% cortex present on dorsal surface.

- Tertiary Flake: Long, broad, and thin flakes; multiple flake scars on dorsal surfaces, small bulbs of percussion.
- Shatter: Blocky, multi-faceted chunks of lithic material; no technological features of their manufacture are present.
- FLAKE: A piece of waste material from the manufacture of stone tools created by percussion or pressure applied to the stone by an object such as a hammerstone, antler flaker or billet.
- HAMMERSTONE: A hand-held or hafted stone used as a hammer. It has a variety of forms, e.g. round, ovoid, etc. and shows evidence of battering in one or more areas. Two subtypes relating to quarries are recognized.
- Maul: Large, heavy, hand held or hafted stone used in battering, or dressing lithic material. Use-wear evident.
- Beaked Hammerstone: A wedge shaped stone weighing approximately 15 to 20 pounds used to batter and dress lithic material. Use-wear evident.
- QUARRY: A place where stones are dug from the earth (e.g. stream bed, gravel bank) or where stone is removed from veins, pockets or exposed rock faces.
- QUARTZ: Refers to crystalline silica whose grains are visible to the un-aided eye.
- PREFORM: A piece of stone that has been flaked and shaped to a symmetrical outline. It may be quadrilateral, triangular or oval and has a regular lensatic cross-section.

Early Stage: The initial stage of lithic reduction which includes the preparation of a bifacially worked lineal edge. Artifacts at this stage exhibit a thick and irregular surface and cross-section and a partially completed bifacially worked lineal edge.

Middle Stage: Bifacial lineal edging of the material is nearly complete with emphasis on surface regularity. Artifacts at this stage possess lenticular (bi-convex) cross-sections and width to thickness ratios from 3 and 4.

Late Stage: Characterized by the start of secondary bifacial thinning. This stage of reduction emphasizes obtaining a preform with an even surface and a flat, thin cross-section that approaches the target tool type. Artifacts exhibit preliminary shaping and edge sharpening.

Percussion: Percussion with a hard or soft hammer is the method used for reduction/thinning. A thick preform.

Pressure: Pressure flaking is the technique used for lithic reduction/thinning. A thin preform.

UNIFACE:

A stone tool or blank that has been flaked only on one side.

Appendix 2

Inventory of Lithic Collection

Chapel Farm Estates, Bronx N.Y.

Stage II Investigation:

T. U. No./	Depth (cm.)	Artifact or Specimen:		Material	Quantity	Comments
		Class	Type			
1:	0-10cm	preform, early stage	bifacial/percussion	quartz	1	
		preform, middle stage	pressure	quartz	1	
		scraper	spokeshave	quartz	1	tool
		flakes	block	quartz	30	
		flakes	primary cortical	quartz	3	tabular
		flakes	secondary cortical	quartz	6	tabular
		flake	tertiary	quartz	1	
		flakes	bifacial thinning	quartz	6	
		flakes	pressure retouch	quartz	16	
		blanks	unifacially edged	quartz	8	
		shatter	large	quartz	16	
		shatter	medium	quartz	24	
		shatter	small	quartz	90	
1:	10-20cm	flakes	block	quartz	5	
		flakes	primary cortical	quartz	1	
		flakes	bifacial thinning	quartz	2	
		flakes	pressure retouch	quartz	2	
		shatter	large	quartz	3	
		shatter	medium	quartz	5	
		shatter	small	quartz	11	
1:	20-30cm	core	block	quartz	1	grinding on platform
		preform, early stage	percussion	quartz	1	
		scraper, graver	bifacial	quartz	1	tool
		flakes	block	quartz	8	
		flakes	secondary cortical	quartz	3	tabular
		flakes	bifacial thinning	quartz	6	
		flake	pressure retouch	quartz	1	
		blank	unifacially edged	quartz	7	
		shatter	medium	quartz	8	
		shatter	small	quartz	1	
1:	30-40cm	flake	block	quartz	1	

		flake	primary cortical	chert	1	
		flakes	bifacial reduction	quartz	2	
		flakes	pressure retouch	quartz	3	
		blanks	unifacially edged	quartz	2	
		shatter	small	quartz	1	
2:	0-10cm	cores	platform	quartz	2	
		core	flake	quartz	1	
		preform, early stage	bifacial/percussion	quartz	1	
		preform, early stage	pressure	quartz	1	
		preforms, middle stage	pressure	quartz	2	
		preform, middle stage	bifacial/percussion	quartz	1	
	S.E. Quad	preform, middle stage	pressure	quartz	1	
		flakes	block	quartz	42	
		flakes	primary cortical	quartz	7	tabular
		flakes	secondary cortical	quartz	3	tabular
		flakes	tertiary	quartz	4	
		flakes	flat	quartz	1	
		flakes	bifacial thinning	quartz	50	
		flakes	notching	quartz	1	wide "V" shape
		flakes	pressure retouch	quartz	28	
		blanks	unifacially edged	quartz	31	
		shatter	large	quartz	34	
		shatter	medium	quartz	43	
		shatter	small	quartz	269	
2:	10-20cm	flakes	block	quartz	2	
	S.E. Quad	flakes	tertiary	quartz	1	
		flakes	bifacial thinning	quartz	4	
		flakes	pressure retouch	quartz	2	
		blanks	unifacially edged	quartz	1	
		shatter	large	quartz	1	
		shatter	small	quartz	11	
	S.W. Quad	flakes	block	quartz	1	
		flakes	bifacial thinning	quartz	3	
		flakes	pressure retouch	quartz	5	
		blanks	unifacially edged	quartz	1	
		shatter	medium	quartz	1	
		shatter	small	quartz	7	
	N.E. Quad	flakes	bifacial thinning	quartz	5	
		flakes	pressure retouch	quartz	3	
		blank	unifacially edged	quartz	1	
		shatter	medium	quartz	1	
		shatter	small	quartz	3	
	N.W. Quad	flakes	block	quartz	2	
		flakes	primary cortical	quartz	1	tabular

		flakes	tertiary	quartz	2
		blank	unifacially edged	quartz	1
		shatter	medium	quartz	1
		shatter	small	quartz	5
2:	20-30cm	flakes	block	quartz	4
		flakes	tertiary	quartz	5
		flakes	bifacial reduction	quartz	5
		flakes	pressure retouch	quartz	8
		blanks	unifacially edged	quartz	7
		shatter	large	quartz	2
		shatter	medium	quartz	22
		shatter	small	quartz	26
2:	30-40cm	preforms, early stage	bifacial/percussion	quartz	2
	S.W. Quad	preforms, E-M stage	pressure	quartz	2
	S.E. Quad	preform, early stage	bifacial/percussion	quartz	1
		flakes	bifacial thinning	quartz	2
		shatter	large	quartz	1
		shatter	small	quartz	5
	S.W. Quad	flakes	block	quartz	2
		flake	bifacial thinning	quartz	1
		blank	unifacially edged	quartz	1
		shatter	small	quartz	4
	N.E. Quad	flake	tertiary	quartz	1
		flake	bifacial thinning	quartz	1
		shatter	medium	quartz	2
	N.W. Quad	flake	block	quartz	1
		flake	pressure retouch	quartz	1
		shatter	medium	quartz	1
		shatter	small	quartz	2
2:	40-50cm	preform, early stage	pressure	quartz	1
	S.E. Quad	flake	block	quartz	1
		shatter	small	quartz	1
	S.W. Quad	preform, E-M stage	bifacial/percussion	quartz	1
		preform, middle stage	pressure	quartz	1
		flakes	pressure retouch	quartz	2
	N.E. Quad	flake	tertiary	quartz	1
		flake	pressure retouch	quartz	1
		shatter	small	quartz	3
	N.W. Quad	preform, early stage	pressure	quartz	1
		flakes	block	quartz	2
		shatter	small	quartz	3
3:	0-10cm	core	platform	quartz	1
		preforms, early stage	bifacial/percussion	quartz	2

		preforms, middle stage	percussion	quartz	2
		flakes	block	quartz	19
		flakes	primary cortical	quartz	7
		flakes	tertiary	quartz	3
		flakes	bifacial reduction	quartz	10
		flakes	pressure retouch	quartz	2
		blanks	unifacially edged	quartz	6
		shatter	large	quartz	9
		shatter	medium	quartz	72
		shatter	small	quartz	70
3:	10-20cm	preform, early stage	bifacial/percussion	quartz	1
		preforms, middle stage	bifacial/percussion	quartz	5
		preforms, M-L stage	bifacial/percussion	quartz	2
		preforms, middle stage	pressure	quartz	2
		preforms, late stage	pressure	quartz	2
		flakes	block	quartz	8
		flake	primary cortical	quartz	1
		flakes	tertiary	quartz	2
		flakes	bifacial thinning	quartz	8
		flakes	pressure retouch	quartz	5
		blanks	unifacially edged	quartz	9
		shatter	large	quartz	1
		shatter	medium	quartz	6
		shatter	small	quartz	43
		Quarry block	large	quartz	2
3:	20-30cm	core	block	quartz	1
		core	cobble	quartz	1
		preform, early stage	bifacial/percussion	quartz	1
		preforms, middle stage	bifacial/percussion	quartz	3
		preform, late stage	pressure	quartz	1
		flakes	block	quartz	15
		flake	tertiary	quartz	1
		flakes	bifacial thinning	quartz	7
		blanks	unifacially edged	quartz	7
		shatter	large	quartz	4
		shatter	medium	quartz	3
		shatter	small	quartz	15
3:	30-40cm	preform, middle stage	pressure	quartz	1
		flakes	block	quartz	4
		flakes	bifacial thinning	quartz	3
		flake	flat	quartz	1
		shatter	large	quartz	1
		shatter	medium	quartz	4

		shatter	small	quartz	4	
3	(no level)	flakes	bifacial thinning	quartz	2	
4:	0-10cm	core	block	quartz	1	
		preform, early stage	bifacial/percussion	quartz	1	
		preforms, middle stage	pressure	quartz	3	
		flakes	block	quartz	16	
		flakes	primary cortical	quartz	3	
		flake	secondary/cortical	quartz	1	
		flakes	bifacial thinning	quartz	5	
		blanks	unifacially edged	quartz	3	
		shatter	middle	quartz	10	
		shatter	small	quartz	49	
4:	10-20cm	core	spheroid	quartz	1	
		preforms, middle stage	bifacial/percussion	quartz	3	
		preforms, middle stage	pressure	quartz	2	
		flakes	block	quartz	5	
		flake	primary cortical	quartz	1	tabular
		flake	secondary cortical	quartz	1	tabular
		flakes	tertiary	quartz	4	
		flakes	bifacial thinning	quartz	4	
		flakes	pressure retouch	quartz	2	
		blanks	unifacially edged	quartz	4	
		shatter	large	quartz	4	
		shatter	medium	quartz	8	
		shatter	small	quartz	21	
4:	20-30cm	preforms, early stage	bifacial/percussion	quartz	5	
		preforms, middle stage	pressure	quartz	1	
		preforms, M-L stage	pressure	quartz	2	
		flakes	block	quartz	8	
		flakes	bifacial thinning	quartz	6	
		flake	pressure retouch	quartz	1	
		blanks	unifacially edged	quartz	7	
		shatter	large	quartz	4	
		shatter	medium	quartz	3	
		shatter	small	quartz	29	
5:	0-10cm	cores	platform	quartz	3	
		preforms, early stage	bifacial/percussion	quartz	5	
		preforms, early stage	pressure	quartz	3	
		preforms, middle stage	bifacial/percussion	quartz	3	
		preforms, middle stage	pressure	quartz	1	
		preforms, M-L stage	pressure	quartz	3	
		flakes	bifacial thinning	quartz	2	

		flakes	pressure retouch	quartz	21	
		flakes	block	quartz	22	
		flake	primary cortical	quartz	1	
		flake	secondary cortical	quartz	1	
		blanks	unifacially edged	quartz	11	
		shatter	large	quartz	9	
		shatter	medium	quartz	8	
		shatter	small	quartz	196	
5:	10-20cm	preforms, early stage	bifacial/percussion	quartz	2	
		preforms, middle stage	bifacial/percussion	quartz	2	
		flakes	block	quartz	5	
		flakes	bifacial thinning	quartz	3	
		shatter	small	quartz	40	
6:	0-10cm	flakes	bifacial thinning	quartz	2	
		flake	pressure retouch	quartz	1	
		blank	unifacially edged	quartz	1	
		shatter	small	quartz	1	
6:	10-25cm	core	block	quartz	1	
		shatter	small	quartz	4	
7:	10-20cm	shatter	medium	quartz	1	
		shatter	small	quartz	5	
7:	20-30cm	shatter	medium	quartz	2	
8:	0-10cm	scraper	unifacial	quartz	1	tool
		preforms, M-L stage	pressure	quartz	2	
		flakes	block	quartz	8	
		flakes	secondary cortical	quartz	2	tabular
		flakes	bifacial thinning	quartz	2	
		flakes	pressure retouch	quartz	9	
		blanks	unifacially edged	quartz	8	
		shatter	medium	quartz	4	
		shatter	small	quartz	39	
8:	10-20cm	preform, early stage	bifacial/percussion	quartz	1	
		preform, middle stage	pressure	quartz	1	
		preform, middle stage	bifacial/percussion	quartz	1	
		flakes	block	quartz	15	
		flakes	bifacial thinning	quartz	3	
		flakes	pressure retouch	quartz	6	
		blanks	unifacially edged	quartz	2	
		shatter	large	quartz	1	
		shatter	medium	quartz	3	

		shatter	small	quartz	26	
8:	20-30cm	core	block	quartz	1	
		preform, middle stage	pressure	quartz	1	
		flakes	block	quartz	9	
		flakes	pressure retouch	quartz	12	
		blanks	unifacially edged	quartz	2	
		flake	primary cortical	chert	1	cobble
		shatter	large	quartz	1	
		shatter	medium	quartz	1	
		shatter	small	quartz	28	
8:	30-40cm	preform, E-M stage	bifacial/percussion	quartz	1	
		flakes	block	quartz	5	
		flakes	bifacial thinning	quartz	3	
		flakes	pressure retouch	quartz	5	
		shatter	small	quartz	6	
9:		not available for study				
10:	0-10cm	core	block	quartz	1	
		preforms, early stage	bifacial/percussion	quartz	2	
		preforms, middle stage	pressure	quartz	2	
		preforms, late stage	pressure	quartz	2	
		utilized flake	scraper	quartz	1	tool
		flakes	block	quartz	25	
		flake	tertiary	quartz	1	
		flakes	bifacial thinning	quartz	2	
		flakes	pressure retouch	quartz	2	
		shatter	large	quartz	5	
		shatter	medium	quartz	7	
		shatter	small	quartz	29	
10:	10-20cm	core	block	quartz	1	
	N.E. Quad	shatter	large	quartz	6	
10:	10-20cm	preforms, early stage	bifacial/percussion	quartz	3	
	N.W. Quad	preform, middle stage	pressure	quartz	1	
		flakes	block	quartz	3	
		blanks	unifacially edged	quartz	3	
		shatter	large	quartz	5	
		shatter	medium	quartz	2	
		shatter	small	quartz	7	
10:	10-20cm	preform, middle stage	pressure	quartz	1	
	S.E. Quad	preform, middle stage	bifacial/percussion	quartz	1	
		flakes	block	quartz	16	

		flake	bifacial thinning	quartz	1	
		blanks	unifacial edged	quartz	8	
		shatter	large	quartz	3	
		shatter	medium	quartz	4	
		shatter	small	quartz	8	
10:	10-20cm	preforms, early stage	bifacial/percussion	quartz	3	
	S.W. Quad	preforms, middle stage	bifacial/percussion	quartz	2	
		proj. point tip	broken	quartz	1	tool. frag.
		flakes	block	quartz	8	
		flakes	bifacial thinning	quartz	2	
		flakes	pressure retouch	quartz	4	
		blanks	unifacially edged	quartz	7	
		shatter	large	quartz	1	
		shatter	medium	quartz	2	
		shatter	small	quartz	5	
10:	20-30cm	core	block	quartz	1	
		core	cobble	quartz	1	
		preforms, middle stage	bifacial/percussion	quartz	4	
		preforms, middle stage	pressure	quartz	4	
		preforms, late stage	pressure	quartz	3	
		flakes	block	quartz	27	
		flake	tertiary	quartz	1	
		flakes	bifacial thinning	quartz	2	
		flakes	pressure retouch	quartz	3	
		blanks	unifacially edged	quartz	10	
		shatter	large	quartz	5	
		shatter	medium	quartz	6	
		shatter	small	quartz	17	
10:	30-40cm	preform, early stage	bifacial/percussion	quartz	1	
		preforms, middle stage	bifacial/percussion	quartz	4	
		flakes	block	quartz	14	
		flakes	primary cortical	quartz	1	tabular
		flakes	tertiary	quartz	5	
		flakes	flat	quartz	2	
		flakes	bifacial thinning	quartz	2	
		blanks	unifacially edged	quartz	4	
		shatter	medium	quartz	2	
		shatter	small	quartz	25	
11:	0-10cm	preforms, middle stage	pressure	quartz	3	
		flakes	block	quartz	6	
		flake	flat	quartz	1	
		flakes	pressure retouch	quartz	2	
		blanks	unifacially edged	quartz	2	

		shatter	small	quartz	5	
11:	10-20cm	preforms, early stage	bifacial/percussion	quartz	2	
		preform, early stage	pressure	quartz	1	
		preform, middle stage	bifacial/percussion	quartz	1	
		preforms, middle stage	pressure	quartz	3	
		preform, M-L stage	pressure	quartz	1	
		flakes	block	quartz	33	
		flakes	tertiary	quartz	3	
		flakes	pressure retouch	quartz	13	
		blanks	unifacially edged	quartz	15	
		flake	block	quartzite	1	
		shatter	medium	quartz	5	
		shatter	small	quartz	34	
11:	20-30cm	preforms, middle stage	bifacial/percussion	quartz	2	
		preform, middle stage	pressure	quartz	1	
		flakes	block	quartz	26	
		flake	tertiary	quartz	1	
		flake	pressure retouch	quartz	1	
		blanks	unifacially edged	quartz	7	
		shatter	large	quartz	4	
		shatter	medium	quartz	5	
		shatter	small	quartz	14	
11:	30-40cm	preform, early stage	bifacial/percussion	quartz	1	
		preform, middle stage	bifacial/percussion	quartz	1	
		preform, middle stage	pressure	quartz	1	
		flakes	block	quartz	10	
		flakes	secondary cortical	quartz	3	tabular
		flakes	bifacial thinning	quartz	5	tabular
		flakes	pressure retouch	quartz	10	
		blank	unifacially edged	quartz	1	
		shatter	small	quartz	22	
12:	0-10cm	preform, early stage	bifacial/percussion	quartz	1	
	N.W. Quad	flakes	block	quartz	3	
		flakes	flat	quartz	1	
		flake	pressure retouch	quartz	1	
		shatter	small	quartz	9	
12:	0-10cm	preform, early stage	bifacial/percussion	quartz	1	
	N.E. Quad	preform, middle stage	bifacial/percussion	quartz	1	
		scraper	unifacial	quartz	1	tool
		flakes	pressure retouch	quartz	2	
		shatter	medium	quartz	1	
		shatter	small	quartz	10	

12:	0-10cm	flakes	bifacial thinning	quartz	2	
	S.W. Quad	shatter	small	quartz	7	
12:	0-10cm	flakes	block	quartz	2	
	S.E. Quad	flakes	pressure retouch	quartz	2	
		shatter	small	quartz	5	
12:	10-20cm	preform, early stage	bifacial/percussion	quartz	1	
	S.E. Quad	preform, middle stage	bifacial/percussion	quartz	1	
		preform, M-L stage	pressure	quartz	1	
		flakes	block	quartz	8	
		flakes	pressure retouch	quartz	4	
		shatter	small	quartz	11	
12:	10-20cm	preform, early stage	bifacial/percussion	quartz	1	
	S.W. Quad	flakes	block	quartz	3	
		flakes	bifacial thinning	quartz	2	
		flakes	pressure retouch	quartz	2	
		shatter	medium	quartz	2	
		shatter	small	quartz	10	
12:	20-30cm	core	block	quartz	1	
12:	20-30cm	preforms, early stage	bifacial/percussion	quartz	2	
	N.E. Quad	preform, middle stage	bifacial/percussion	quartz	1	
		preforms, middle stage	pressure	quartz	4	
		flakes	block	quartz	19	
		flake	primary cortical	quartz	1	tabular, crushing on base
		flake	primary cortical	quartz	1	tabular
		flakes	secondary cortical	quartz	2	tabular
		flakes	bifacial thinning	quartz	5	
		flakes	pressure retouch	quartz	8	
		blanks	unifacially edged	quartz	5	
		shatter	large	quartz	2	
		shatter	medium	quartz	2	
		shatter	small	quartz	34	
12:	20-30cm	preform, middle stage	bifacial/percussion	quartz	1	
	N.W. Quad	flake	primary cortical	quartz	1	tabular; crushing on edge
		flake	primary cortical	quartz	1	tabular
		flakes	block	quartz	4	
		flakes	bifacial thinning	quartz	3	
		blank	unifacially edged	quartz	1	
		shatter	medium	quartz	2	

		shatter	small	quartz	12	
12:	20-30cm	preform, middle stage	pressure	quartz	1	
	S.W. Quad	flakes	block	quartz	6	
		flakes	pressure retouch	quartz	7	
		blanks	unifacially edged	quartz	4	
		shatter	medium	quartz	1	
		shatter	small	quartz	11	
12:	30-40cm	preform, early stage	bifacial/percussion	quartz	1	
	S.W. Quad	flakes	block	quartz	3	
		flake	primary cortical	quartz	1	
		flake	tertiary	quartz	1	
		flake	bifacial thinning	quartz	1	
		flake	flat	quartz	1	
		shatter	medium	quartz	2	
		shatter	small	quartz	9	
12:	30-40cm	shatter	large	quartz	1	
	S.E. Quad					
12:	30-40cm	flakes	block	quartz	6	
	N.E. Quad	flakes	pressure retouch	quartz	7	
		blanks	unifacially edged	quartz	2	
		shatter	small	quartz	24	
12:	30-40cm	flakes	block	quartz	4	
	N.W. Quad	flakes	pressure retouch	quartz	2	
		flake	notching	quartz	1	
		blanks	unifacially edged	quartz	2	
		shatter	small	quartz	5	
		shatter	small	argillite	1	
12:	40-50cm	preform, middle stage	pressure	quartz	1	
		flakes	block	quartz	10	
		flakes	bifacial thinning	quartz	5	
		flakes	pressure retouch	quartz	4	
		blank	unifacially edged	quartz	1	
		shatter	medium	quartz	1	
		shatter	small	quartz	37	
12:	40-50cm	preform, late stage	pressure	quartz	1	fragment
	N.W. Quad	flakes	block	quartz	4	
		flakes	primary cortical	quartz	1	tabular
		flakes	bifacial thinning	quartz	2	
		shatter	medium	quartz	1	
		shatter	small	quartz	3	

12:	50-60cm	preforms, early stage	bifacial/percussion	quartz	2	fragments
		preforms, late stage	pressure	quartz	3	
		flakes	block	quartz	6	
		flake	flat	quartz	1	
		flakes	bifacial thinning	quartz	7	
		flakes	pressure retouch	quartz	3	
		shatter	medium	quartz	2	
		shatter	small	quartz	20	
12:	60-70cm	preforms, middle stage	pressure	quartz	3	fragment
		preform, late stage	pressure	quartz	1	
		flakes	block	quartz	5	
		quarry block/core	large	quartz	1	
		flakes	bifacial thinning	quartz	8	15cmX14cm X13.5cm
		flakes	pressure retouch	quartz	12	
		blanks	unifacially edged	quartz	6	
		shatter	large	quartz	1	
		shatter	medium	quartz	1	
		shatter	small	quartz	20	
12:	60-70cm N.W. Quad	flake	primary cortical	quartz	1	tabular
		flakes	pressure retouch	quartz	8	
		pebble	unifacially edged	quartz	1	
		blank	unifacially edged	quartz	1	
		shatter	medium	quartz	1	
		shatter	small	quartz	6	
13:	0-10cm	core	platform	quartz	1	tabular
		preform, middle stage	pressure	quartz	1	
		flakes	block	quartz	30	
		flakes	primary cortical	quartz	2	
		flakes	secondary cortical	quartz	3	
		flakes	bifacial thinning	quartz	6	
		flakes	pressure retouch	quartz	27	
		blanks	unifacially edged	quartz	10	
		preform, early stage	pressure	quartz	1	tool
		preform, middle stage	bifacial/percussion	quartz	1	
		hammerstone	soft	sandstone	1	
		shatter	large	quartz	2	
		shatter	medium	quartz	4	
		shatter	small	quartz	259	
13:	10-20cm	preforms, early stage	bifacial/percussion	quartz	10	
		preforms, middle stage	bifacial/percussion	quartz	3	
		preforms, middle stage	pressure	quartz	5	

		preform, late stage	pressure	quartz	1	
		flakes	block	quartz	14	
		flakes	primary cortical	quartz	7	tabular
		flakes	tertiary	quartz	2	
		flake	flat	quartz	1	
		flakes	bifacial thinning	quartz	7	
		flakes	pressure retouch	quartz	23	
		blanks	unifacially edged	quartz	26	
		shatter	large	quartz	4	
		shatter	medium	quartz	5	
		shatter	small	quartz	51	
13:	20-30cm	flakes	block	quartz	7	
		flakes	pressure retouch	quartz	6	
		blanks	unifacially edged	quartz	9	
		shatter	small	quartz	13	
13:	30-35cm	flakes	bifacial thinning	quartz	2	
		flakes	pressure retouch	quartz	3	
14:	0-10cm	preform, middle stage	pressure	quartz	1	
		flakes	block	quartz	11	
		flake	bifacial thinning	quartz	1	
		flakes	pressure retouch	quartz	6	
		blanks	unifacially edged	quartz	2	
		shatter	small	quartz	8	
14:	10-20cm	core	block	quartz	1	
		flakes	block	quartz	2	
		flake	secondary cortical	quartz	1	tabular
		flakes	bifacial thinning	quartz	6	
		flakes	pressure retouch	quartz	5	
		blanks	unifacially edged	quartz	3	
		shatter	medium	quartz	1	
		shatter	small	quartz	6	
14:	20-30cm	preform, middle stage	bifacial/percussion	quartz	1	
		preform, late stage	pressure	quartz	1	
		scraper	unifacial	quartz	1	tool
		flakes	block	quartz	11	
		flake	flat	quartz	1	
		flakes	bifacial thinning	quartz	4	
		flakes	pressure retouch	quartz	6	
		blanks	unifacially edged	quartz	3	
		shatter	large	quartz	1	
		shatter	medium	quartz	2	
		shatter	small	quartz	10	

		core	block	quartz	1	
14:	30-40cm	preforms, early stage	bifacial/percussion	quartz	2	
		preform, middle stage	bifacial/percussion	quartz	1	
		flakes	block	quartz	2	
		flakes	pressure retouch	quartz	2	
		blank	unifacially edged	quartz	1	
		shatter	medium	quartz	1	
C:	0-20cm	flakes	block	quartz	5	
		quarry cobble/core	large	quartz	1	14cmX14cm X12cm
		flakes	pressure retouch	quartz	2	
		shatter	small	quartz	7	
Area 12		hammerstone		quartzite	1	tool
surface		blank	unifacially edged	quartz	1	

Appendix3

Test Excavation Records

1994

Location: Lot 10, East of QIS 4,5

Test No.	Stratum	Depth (inches)	Description of Strata/Munsell Soil Color	Cultural Remains
1 (3' X 3')	Surface			hammerstone frag.
	I	0-4	Very dk. brown silty sandy loam, few pebbles; 10 YR 2/2	cer. frag., glass frag.
	II	4-9	Very dk. brown silty sandy loam, many rocks (1.5" -5" in size); 10 YR 2/2	pcs. of coal
	III	9-26	Dk. yellowish brown silty sand, many lg. frag. of gneiss; 10 YR 4/6	none
2	I	0-3	Very dk. brown sandy loam, few sm. angular rocks; 10 YR 2/2	coal
	II	3-22	Dk. yellowish brown silty sandy clay, wet; 10 YR 4/6	none

Location: Lot 11, South of QIS 3

3	I	0-5	Very dk. brown sandy loam, few sm. angular rocks; 10 YR 2/2	coal
	II	5-20	Dk. yellowish brown silty sand; 10 YR 4/4	none

Location: Lot 10, East of QIS 4, 5

4	I	0-3	Very dk. brown silty sandy loam; 10 YR 2/2	none
	II	3-8	Dk. yellowish brown silty sandy clay; 10 YR 3/4	none
	III	8-27	Strong brown silty clay, wet; 7.5 YR 4/6	none

Location: Lot 11, South of QIS 1, 13

5	I	0-4	Black silty sandy loam; 10 YR 2/1	pc. of coal
	II	4-10	Brown silty clay; 10 YR 4/3	none
	III	10+	Bedrock	none
6	I	0-6	Very dk. grayish brown silty sandy loam; 10 YR 3/2	none
	II	6-11	Dk. yellowish brown sandy silt, quartz pebble; 10 YR 4/6	none
	III	11-22	Strong brown silty sandy clay; 7.5 YR 5/6	none
	IV	22+	Bedrock	none

7	I	0-3	Very dk. brown silty sandy loam; 10 YR 2/2	none
	II	3-9	Dk. yellowish brown silty sandy clayey loam; 10 YR 3/4	none
	III	9-24	Strong brown sandy silty clay; 7.5 YR 4/6	none
8	I	0-3	Very dk. brown silty sandy loam, quartz pebble; 10 YR 2/2	pc. coal
	II	3-10	Dk. yellowish brown silty clay; 10 YR 4/6	none
	III	10+	Bedrock	none
9	I	0-3	Very dk. brown silty sandy loam; 10 YR 2/2	glass
	II	3-8	Dk. yellowish brown silty sandy clayey loam; 10 YR 3/4	none
	III	8-23	Strong brown sandy silty clay; 7.5 YR 4/6	none
10 (QIS 13)	I	0-11	Very dk. brown silty sandy loam; 10 YR 2/2	none
		11+	Bedrock	none

Location: QIS 7, Lot 6

11 (3' X 3')	I	0-8	Very dk. grayish brown silty loam, rect. stone block; 10 YR 3/2	bottle frag.
	II	8-18	Dk. grayish brown sandy silt; 10 YR 4/2	none
	III	18-25	Strong brown sandy silty clay; 7.5 YR	none
	IV	25+	Rock	none
12	I	0-9	Very dk. grayish brown silty loam; 10 YR 3/2	none
	II	9-15	Dk. yellowish brown silty sand; 10 YR 3/4	none
	III	15+	Bedrock	none
13	I	0-21	Dk. brown silty sand; 10 YR 3/3 disturbed, fill	brick frags., coal
	II	21-28	Dk. yellowish brown sandy silt; 10 YR 4/6	none
14	I	0-9	Dk. brown sandy loam; 10 YR 3/3	none
	II	9-10	Burnt wood, charcoal; 10 YR 2/1	none
	III	10-24	Dk. yellowish brown silty clay, 10 YR 4/6	

Location: At QIS 7

15	I	0-1	Very dk. grayish brown silty loam; 10 YR 3/2	none
	II	1+	rock	none

Location: Lot 12

16	I	0-3	Black silty sandy loam 10 YR 2/1	none
	II	3-10	Dark brown silty sandy loam; 10 YR 3/3	pc. coal
	III	10-28	Dk. yellowish brown silty sandy clay; 10 YR 4/4	none
17	I	0-9	Dk. brown sandy silty loam; 10 YR 3/3	none
	II	9-28	Yellowish brown sandy silty clay; 10 YR 5/6	none
	III	28+	Bedrock	none
18	I	0-1	Black silty loam, humus; 10 YR 2/1	none
	II	1-3	Dk. yellowish brown silty clayey loam; 10 YR 4/6	none

III	3-12	Mottled dk. yellowish brown, very dk. grayish brown silty clayey loam; 10 YR 4/6, 3/2; disturbed	none
IV	12-24	Dk. yellowish brown silty sandy clay; 10 YR 4/6	none

Location: Lot 4, QIS 14

19	I	0-5	Black silty loam, humus; 10 YR 2/1	none
	II	5+	Bedrock	none
20	I	0-3	Black silty sandy loam; 10 YR 2/1	none
	II	3-12	Dk. yellowish brown silty sandy clay, bits of charcoal; 10 YR 4/4	none
21	III	12-25	Strong brown silty sandy clay; 7.5 YR 5/6	none
	I	0-5	Very dk. brown sandy loam; 10 YR 2/2	glass, coal
	II	5-12	Dk. yellowish brown silty sandy clay; 10 YR 4/6	cer. frag.
	III	12+	Bedrock	none

Location: Lot 7, QIS 15

22	I	0-5	Black silty loam, humus; 10 YR 2/1	none
	II	5+	Bedrock	none
23	I	0-7	Black silty loam; 10 YR 2/1	bottle frags.
	II	7+	Rock, heavy roots	none

Location: Lot 1

24	I	0-10	Very dk. gray sandy loam; very stony; 10 YR 3/1	none
	II	12-26	Dk. brown silty sand; 10 YR 3/3	none
25	I	0-10	Very dk. gray sandy loam; stony; 10 YR 3/1	none
	II	10-23	Dk. brown silty sand; 10 YR 3/3	none

Appendix 4

1994 Artifact Inventory: Descriptions and Provenience

Location	Test No. Stratum	Artifact	Material/Color	Quantity	Comments
QIS 5, Lot 10	1/Surface (3' X 3')	Hammerstone fragment 118mm X 110 mm X 83mm	quartz/gray brown	1	cobble; edge battering pres.
QIS 5, Lot 10	1-I (3' X 3')	Cup frag., rim whiteware with purple trans. print dec. and lt. brown painted floral des overglaze	ceramic/white body	1	1820-pres.
		bottle frag., body, with mold seam, molded letter	glass/lt. green	1	prob. late 19th c.
QIS 5, Lot 10	1-II (3' X 3')	pcs. coal	anthracite/black	2	
Lot 10	2-I	pc. coal	anthracite/black	1	
		pc. burnt coal	anthracite/ gray black	1	
Lot 11	3-I	pc. coal	anthracite/black	1	
Lot 11	5-I	pc. coal	anthracite/black	1	
Lot 11	8-I	pc. coal	anthracite/black	1	
Lot 11	9-I	window glass frag.	glass/lt. green	1	1830+
Lot 6	11-I (3' X 3')	beer bottle frag.	glass/amber	1	20th c.
Lot 6	13-I	brick frags; small coal	clay/red anthracite/black	12 18	
Lot 12	16-II	pc. coal	anthracite/black	1	
Lot 4	21-I	pc. coal	anthracite/black	2	
		glass frag., thick	glass/lt. green	1	
Lot 4	21-II	flower pot frag.	ceramic/red	1	
Lot 7	23-I	bottle neck, tool marks, applied rim	glass/clear	1	late 19th century
		bottle frag., base and body	glass/clear	1	prob. late 19th c.
Lot 4, Tool Locus # 1	Surface	hammerstone, beaked; 126mm X 80mm X 70mm	diabase/black, brown	1	cobble; battered tip
Lot 4, Tool Locus # 1	Surface	hammerstone; 86mm X 92mm X 100mm	quartzite/black/tan	1	cobble; broken, battering pres.
Lot 4, Tool Locus # 2	Surface	hammerstone; 86mm X 80mm X 45mm	quartzite/grayish black	1	cobble; ext. end battering pres.

Lot 4, Tool Locus # 2	Surface	hammerstone; 93mm X 84mm X 60mm	granite/dk. gray-brown	1	cobble; weathered, edge battered
Lot 4, Tool Locus # 2	Surface	hammerstone; 176mm X 126mm X 53mm	quartz/brown dk. gray	1	flat cobble; ext. battered end
Lot 4, Tool Locus # 2	Surface	maul or anvil; 190mm X 185mm X 115mm	granite/dk. gray	1	spalled and battered
Lot 11, Tool Locus # 3	Surface	hammerstone fragment; 110mm X 90mm X 42mm	quartzite/lt. gray-tan	1	split cobble battered surface
Lot 11, QIS 1	Surface	rock spall (previously reported as beaked wedge shaped pounding stone); 146mm X 98mm X 42mm	gneiss/dk. gray, reddish brown	1	Natural
Lot 2, Quartz Deb. Locus A	Surface	small cobble (unworked)	quartz/white	1	Natural
Lot 2, Quartz Deb. Locus B	Surface	large block; 140mm X 75mm X 65mm	quartz; smoky, grayish, pink	1	
Lot 2, Quartz Deb. Locus B	Surface	shatter; 116mm X 56mm X 48mm	quartz, smoky	1	
Lot 10, QIS 13	Surface	shatter, large	quartz/smoky	1	
		shatter, small	quartz/smoky	5	
Lot 5, Quartz Red. Wkp.	Surface	shatter, small	quartz/milky	12	
		block flakes	quartz/milky	5	
		bifacial thin. flakes	quartz/milky	3	
		press.-retouch flake	quartz/milky	1	
		hammerstone; 48mm X 48mm X 23mm	granitic/tan brown	1	pebble battered

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