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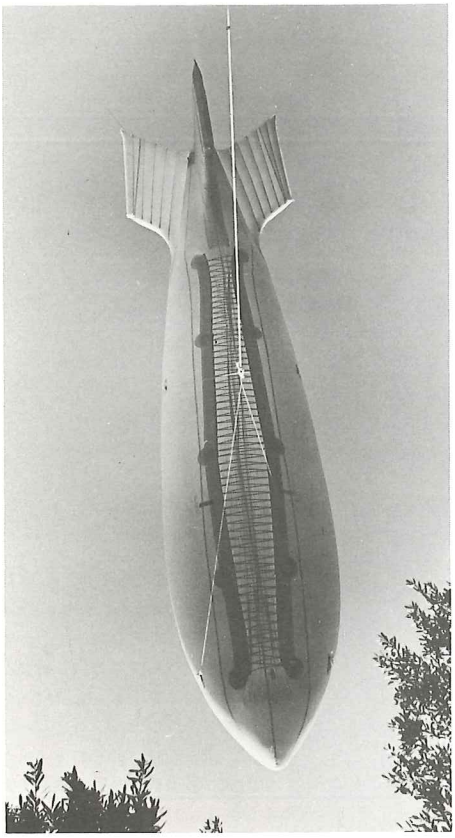
CONTEXT



Thirty-three foot inflatable blimp of urethane-coated nylon lifts tether from which dual cameras are supported in a magnesium gimbal and controlled by radio.

INSIDE THIS ISSUE:

Aerial Photography at Ancient Sites

by J. Wilson Myers and Eleanor Emlen Myers

J. Wilson Myers, Research Professor of Archaeology, and Eleanor Emlen Myers, Research Fellow, have recently joined the Department of Archaeology at Boston University, bringing with them their thirty-three foot captive blimp, radio-controlled cameras, aerial photo archive, and computer base of related data. They have specialized in aerial prospecting and site recording for the past 13 years, photographing over 90 sites, working in Italy, Sicily, Yugoslavia, Israel, Greece, and, most recently, in Crete, where four years of fieldwork have now been completed for their forthcoming Aerial Atlas of Ancient Crete, *a project sponsored by the National Endowment for the Humanities.*
Moving their academic base from Michigan State University, where their research in the field and laboratory had been warmly encouraged, the Myers were attracted to Boston University by the new Center for Remote Sensing with which the Department of Archaeology and the Center for Archaeological Studies are affiliated. They will be able to combine their own forms of remote sensing through low-altitude photography to the capabilities offered by the multi-spectral scanning and the image enhancement and analysis techniques made possible through computer manipulation of the aerial data.

The low-altitude aerial recording system that we use is a much-improved version of the tethered balloon and camera method first developed by P.L.O. Guy in 1930 while he was field director for James Breasted's University of Chicago excavation at Megiddo—site of the ultimate biblical Armageddon—in Palestine. At each level of excavation during the season, Guy made detailed 8" X 10" negatives at a very low level with a homemade plywood camera whose shutter he released with a solenoid wired to a box of batteries on the ground, and found that these "photo-plans" offered a great advantage for interpretive study at the time and were most useful as a permanent state record. The enlarged photographs made up a mosaic of the entire citadel, eliminating much tedious drawing and measurement. The major problem was that the spherical balloon used by Guy proved quite unstable in the eddying winds of the Megiddo plain. Though the lift of the balloon could support the camera in calm air, the apparatus had an unfavorable lift to drag ratio and, unlike a kite, headed for the ground when a breeze sprang up. At the end of the 1930 season, the camera crashed when the balloon was blown down, and the method, which could only be used on dead-calm days, was abandoned as impractical. Nevertheless, the field reports by Guy and Breasted give a glowing account of the earlier results and the value of the photographs. Two sets of prints were made, one for use in the field, and one for safekeeping in the archive at Chicago. Guy also made glass slides for "magic lantern" projection and found that a leisurely study of the greatly enlarged images enabled him to see patterns that had been invisible on the ground and to make sense of the complex network of overlapping mud-brick walls, shifting as they did through rebuilding at the many stratigraphic levels.

The development of the motor-driven and radio-controlled Hasselblad camera, used by NASA for the first photographs on the moon, now allows continuous filming—where Guy had to lower

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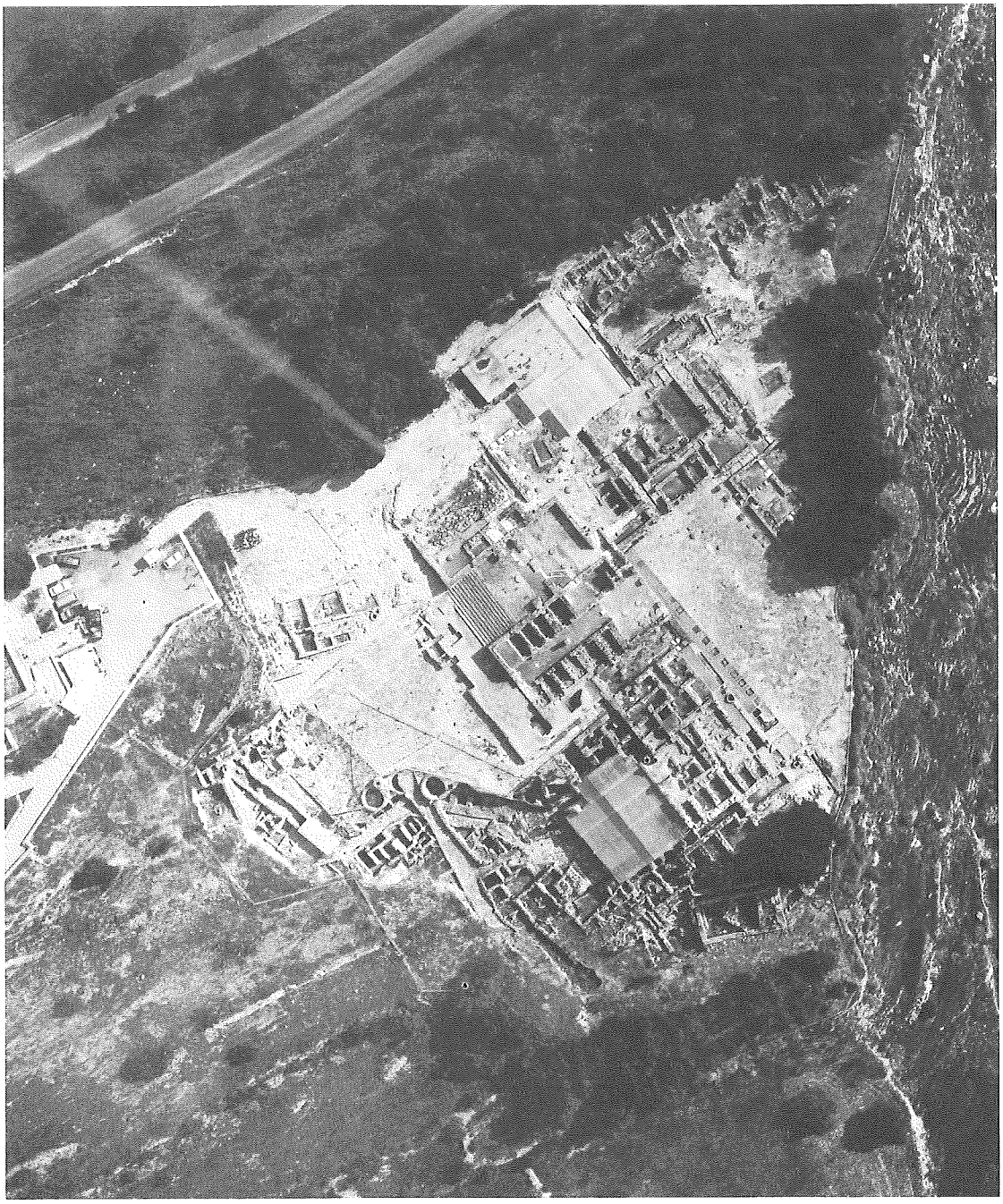
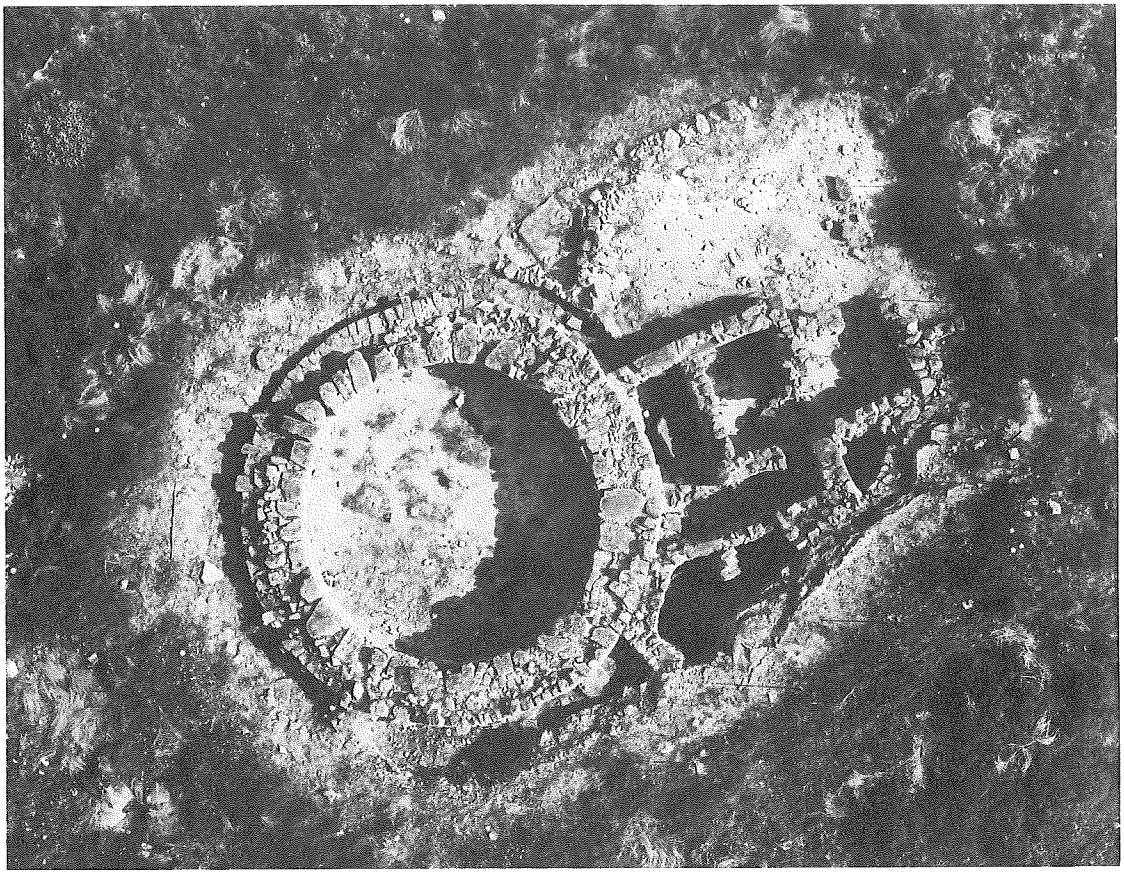


Minoan Palace at Phaistos, recorded by balloon camera in 1984 for the Aerial Atlas of Ancient Crete. *Corner of main courtyard (right) has disappeared with erosion of steep hillside. Hilltop location commands the fertile fields of the Mesara Plain.*

the balloon each time he took a picture—and has made the camera operation much simpler. But it is the use of the pressurized and aerodynamic kite-balloon (essentially an inflatable blimp) that offers a better lift-drag ratio and permits flight in breezes from 12 to 15 mph. A braided polyester fiber is used for the tether cord; stronger than nylon, it is light enough so that the camera can climb to 800 meters before the weight of cord reaches equilibrium with the lift of the balloon. A larger balloon, either spherical or aerodynamic, would offer more altitude but could not be hand-held and would require machinery to raise and lower it. We have experimented with large kites, but find that they become difficult to control in a rising wind and are unstable in the eddying currents of mountain air.

The specific advantage of the balloon recording method is that it can operate at lower altitudes—and thus provide images of higher resolution—than can satellites or airplanes. Operating range of the present blimp starts as low as 10 meters and reaches up to 800 meters—from which a square kilometer is easily photographed. Helicopters can be used at low level over some sites, though the unstable hovering mode produces much vibration, and the down-draft is not only destructive to fragile excavations but causes ripples over drowned sites photographed in shallow water. The balloon method has been particularly useful, when a water penetration filter is used, in recording sites now submerged near the ocean shore. Through clear water, structures can be seen to a depth of 30 feet or more.

The Myers use a specially designed aerodynamic blimp of unusually light urethane coated nylon, whose four tail fins and kite bridle keep it stable in moderate breezes.



The Kamilari tholos tomb is one of many Minoan tombs that dot the Mesara Plain. These communal or family burial chambers were in continued re-use for centuries and may be the models for the later Mycenaean Greek "beehive tombs." Two-meter ranging pole at left gives scale.

Two motor-driven cameras are flown in tandem, suspended in a magnesium gimbal that holds the lens axis perpendicular to the ground. Over a level site, the result is an orthographic rendering. On uneven sites, ranging poles placed on the ground at several levels give the scale and, since the poles are placed to point north, compass orientation.

Field procedures at the site to be recorded vary a bit with the terrain and the weather, but a camp is established with a specially outfitted VW van, which serves both as a balloon tender and, where other facilities are lacking, a mobile darkroom. Tents are provided for the ground crew, which may include two or three persons in addition to the Myers. The site is first carefully measured, with the exact locations marked for the successive stations at which members of the crew will hold the ends of the tether cord for given altitudes. The tether cords are color coded at regular intervals so that the exact altitude of the cameras can be regulated, and the excess cord is carried on a convenient back-pack reel, allowing the crew to walk the balloon to sites that cannot be reached by vehicle. Allowing delays for weather and moving the crew and equipment, the season's schedule has averaged about a site per week. Regional studies covering many square miles can take longer, but where much territory is to be covered at moderate altitude, survey by mapping plane is preferable.

When the pre-dawn weather is promising and winds and clouds do not threaten, the balloon is unfolded on its ground cloths and inflated from the cylinders of compressed gas. A dilation panel of pleats and shock-cords—a sort of girdle—along the bottom of the blimp helps it keep its aerodynamic shape through changes of temperature and altitude. Since the altitude and the focal length of the lenses are known, the area covered on the ground is easily calculated. The centering over an archaeological target is controlled by crew members using walkie-talkies to site the balloon into north-south and east-west alignment. When all is ready, the cameras are triggered by FM radio signal, the twin cameras providing a choice of films. Black-and-white negatives are developed the same day and carefully studied. If these are properly centered and framed, the colored photos taken at the same instant will follow suit and need not be developed in the field.

After recording and exploring for many years at the request of individual excavators in the Mediterranean, we became convinced of the value of a unified aerial study that would concentrate on a group of sites closely related by culture and geography. Thus the idea of an aerial atlas series evolved, and a preliminary visit to the Minoan sites on Crete made that island a clear candidate for a first volume. Ever since Sir Arthur Evans and others began investigating Minoan sites on Crete at the turn of the century, much mystery and scholarly excitement have been inspired by this pre-Greek people, the pioneers of civilization in the western world.

Now that the four-year project to record the 43 major sites on Crete has been completed, an editing grant from NEH is enabling us to compile the entries and interpretive drawings that will appear opposite the large format

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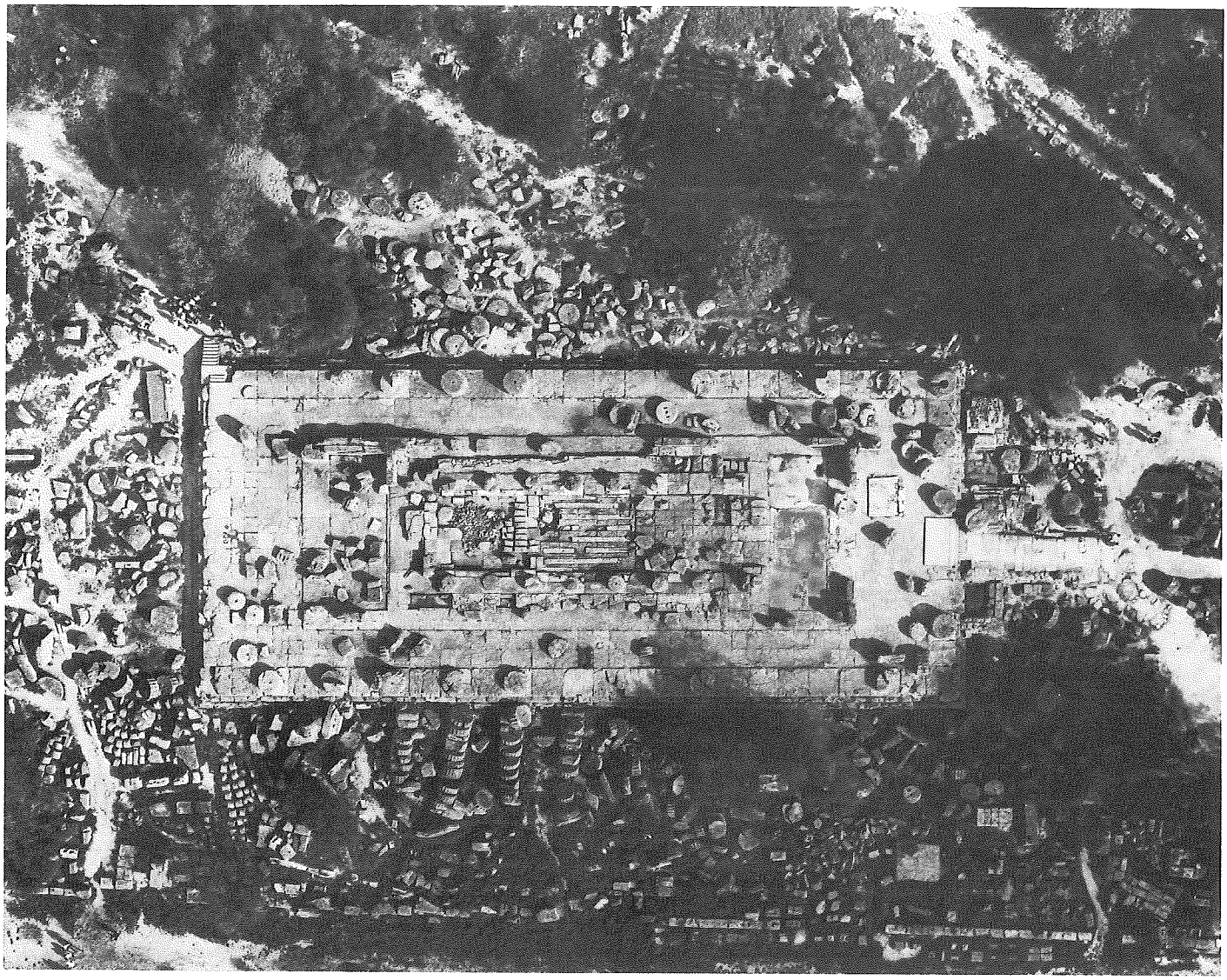
photographs. British archaeologist Gerald Cadogan, a colleague in the creation of the *Aerial Atlas of Ancient Crete*, is drawing on his 25 years of experience in Crete to coordinate the data submitted by currently active excavators and to originate those for sites now in the public domain. Because many of these excavations are fragile and subject to erosion, the photoplans will conserve data that would otherwise be lost to future scholarship. The research value of the *Atlas* will be enhanced by a general discussion of the complex chronology of Crete and the inclusion of an updated bibliography for each site.

For further volumes in the *Aerial Atlas* series, we will enlist the aid of other regional specialists. Plans are now being made for an *Aerial Atlas of Ancient Sicily*, with the expectation that Macedonia, Cyprus, and Turkey will be next. But collaboration will also continue at individual sites outside the *Atlas* series. Last season saw the authors with their balloon at Olympia and Nemea (both sites of ancient panhellenic games) and the Mycenaean citadel at Gla; this year we will visit Epidauros, Ithaca, and Naxos in Greece and Selenute in Sicily.

Excavators use low-altitude aerial photographs both as a convenient method for recording successive levels of excavation for future study and for presentation of sites through publication and lecture slides. High-resolution photographs made with the newer color of infra-red films, can preserve nuances of rock or soil tones that escape the architect, and the photographs serve as a quick check on the measured, recorded, and drawn dimensions that appear on a plan. Using photographs in overlapping stereo pairs, even vertical measurements may be checked through careful photogrammetry, and close observations made through greatly exaggerated stereo viewing, which makes canyons and alps appear in almost level ground.

But the photograph is not always a full substitute for the practiced eye of the recording architect, for whom the smallest



Its column drums tumbled by an earthquake, the Temple of Zeus at Olympia dominated the sanctuary area at the Olympic games.

scratches or builders' marks may be meaningful and who can interpolate missing walls and returns and other features on the basis of long experience. Photographs and drawn plans should ideally complement one another in recording and reporting excavations. In the regional *Atlas* format, they will appear side by side for the light each can shed on the other.

With archives of aerial photographs (or magnetically recorded images) of archaeological sites developing now in many countries and exchanging information with each other, it may soon be possible to develop computer programs to scan any location on earth for site potential—noting configurations of land, water, surface formation—and to indicate where unlocated sites may still be uncovered. What is more, as a typology for each culture is developed for the site configurations to be seen from the air, a computer program could scan images for known patterns and make a tentative identification of the sites it located. Nothing can replace the ultimate utility of the spade (or the dental pick) for the truth to be revealed by excavation, but the crop markings, frost markings, and shapes revealed by standing water after a rain, which are best seen and identified from the air, may be the best means for prospecting and exploring. Unmistakable shapes of prehistoric sites have first been located and photographed from the air in England in patterns of melting frost—reflections of differences in soil density so subtle that the trowel was unable to verify the find.

Aerial archaeology is an exciting and fast-growing field, and the recent formation of the Center for Remote Sensing at Boston University, linked with NASA through data from planes, the space shuttle, and satellites, and the computer programs for image enhancement and analysis, promises much for the future. Now images from the low-altitude aerial surveys will form a first rung on this continuous ladder of aerial capability.

New Center for Remote Sensing

by James R. Wiseman

Archaeology will play a major role in the new Center for Remote Sensing (CRS) which will open this summer at Boston University, contingent upon approval by the Board of Trustees. The Department of Archaeology joined the Departments of Geography and Geology in developing the concept that led to the creation of the Center during this past year.

The principal objectives of the CRS, as set out in its Charter, are to:

A) develop, sponsor, and coordinate remote sensing applications in research projects, and conduct computer-assisted analyses of remotely sensed data from those and other projects;

B) provide a national and international base for interdisciplinary research and teaching of remote sensing and related computer-assisted analysis;

C) develop programs and projects involving new applications of remote sensing in disciplines whose practice requires an interdisciplinary approach;

D) serve as a regional, national, and international resource for information about, and education and training in, all types of remote sensing.

Facilities of the CRS at present include a VAX 11/750 computer, the DIPIX Aries II image processing and display systems, a coordinate digitizer, and a matrix camera. The DIPIX systems are also able to make use of the software (ELAS) that was developed by NASA for the analysis of remotely sensed data. Two complete workstations are now in operation in the Center's temporary quarters, Rooms 128 and 141 in the Stone Science Building. The Center will move to larger, permanent quarters on the 4th floor of the same building when remodelling has been completed during the coming academic year.

The Center will provide a base and facilities not only for research, but also for teaching courses in remote sensing. The Center will also offer workshops, seminars, and special training programs for American and foreign researchers. It will be concerned primarily with remote sensing from spacecraft and aircraft, but will also be concerned with other types of remote sensing, including aerial photography from airplanes and tethered balloons, underwater sensing, and geophysical prospecting.

Members of the Department of Archaeology and the Center for Archaeological Studies are now developing research projects involving remote sensing in Europe, Asia, and the United States. Plans are also underway for special training programs to introduce archaeologists to this new technology, and the Department will include a remote sensing component in a new course on computer applications in archaeology to be offered next spring by F.P. Hemans. Courses in remote sensing and in the computer-assisted analysis of remotely sensed data are already offered by Curtis Woodcock, Assistant Professor of Geography.

Appointments

Dean Geoffrey Bannister announces that Curtis Woodcock, Assistant Professor of Geography, will serve as Acting Director of the Center for Remote Sensing, and that Frederick P. Hemans will also join the senior staff as Director of Remote Sensing Applications in Archaeology. Hemans, who completed his studies for the Ph.D. in the Department of Archaeology in May, takes up his duties with the CRS in July and will join the Department of Archaeology as a Visiting Assistant Professor in September. Dean Bannister also announced that the Executive Committee of the Center, composed of representatives from all departments and centers that are directly involved in the CRS, will be chaired by James Wiseman, Chairman of the Department of Archaeology.

Antiquarians and Archaeologists: Rhode Island Burial Survey

by Lauren Cook

Providence, 1785

The location of Bowen Street had been laid out, and the workmen began preparing for the arduous task of laying the roadbed. Fences had to be taken down and trees removed from the line of the block-long street that was to run between Town Street and Benefit Street. One of the workmen was assigned the task of harvesting the vegetables from a garden along Town Street, no doubt under the watchful eye of the garden's owner. One of the cabbages proved particularly difficult to remove. Bracing himself, the now anonymous laborer pulled again. When the cabbage was uprooted, the reason for its stubbornness was clear. Tangled in its roots was a human skull When the workmen recovered from their surprise, they began digging in the area of this unusual find. Later descriptions indicate that they had uncovered a cemetery dating to the Contact Period, when Rhode Island's Indians were receiving European goods through trade. Although no record was kept of the number of burials that were found, there is mention of several "copper pots," or kettles. In fact, so little notice was paid to this unusual occurrence that mention of it did not appear in print until 75 years later with the publication of Zachariah Allen's Memorial of Roger Williams *in 1860.*

Southern Rhode Island, 1982

The bulldozer operator was hot and tired. He had spent the last several days preparing land for the construction of a housing development, breaking the sod and pushing it into large piles. After shutting his machine off for the day, he walked past the heaps of earth on the way to his car. Something caught his eye. On closer inspection, it became clear that the surface of one of the mounds was littered with broken glass, ceramics, and what appeared to be human bones.
A field examination by the Rhode Island Historical Preservation Commission found that the bulldozer blade had disturbed nine Indian burials. An agreement was reached among the Commission, the landowner, and the Narragansett tribe to permit full archaeological excavation of the site, which proved to be a Narragansett cemetery dating from about 1650 to 1670. During the excavation, the site's location was kept secret from the press and the public in order, to prevent looting of the site, now known as RI-1000. When analysis is complete, the 59 burials and their associated artifacts will constitute the most intensively studied remains from that period ever excavated in the state.

In the aftermath of the RI-1000 discovery, the Rhode Island Historical Preservation Commission recognized the need for a comprehensive plan for dealing with Indian burials throughout the state. Before such a plan could be drawn up, however, several questions had to be answered. How many Indian burials have been found in Rhode Island? In what kinds of geographical environments were they located? How can we best protect those cemeteries whose locations are known? The Rhode Island Burial Survey (RIBS) was developed by Boston University's Office of Public Archaeology (OPA) to answer those and other questions through extensive documentary research combined with site examinations. The survey was funded by a Survey and Planning Grant from the preservation commission and was conducted by the author of this report under the supervision of Ricardo J. Elia, Director of the OPA.

The first stage of the survey consisted of a search for mention of burials in documentary sources. Archaeological reports and articles, local histories, articles in historical journals and newspapers, manuscripts, and site files of archaeological organizations, as well as the memories of the state's archaeological community, were consulted. In all, more than 125 documentary sources were examined, and information on burials was provided by no fewer than six archaeological organizations. Seventy-six sites were identified during this phase of the project, of which fewer than 20 were previously known to the Preservation Commission. Mention of sites varied from detailed descriptions of locations and contents to single sentences indicating that burials were known to exist in some general area. Information on the date of discovery and the number of burials recovered was noted for each site. About three quarters of the sites could be assigned to the Prehistoric Period, the Contact Period, or the Historical Period on the basis of the site descriptions.

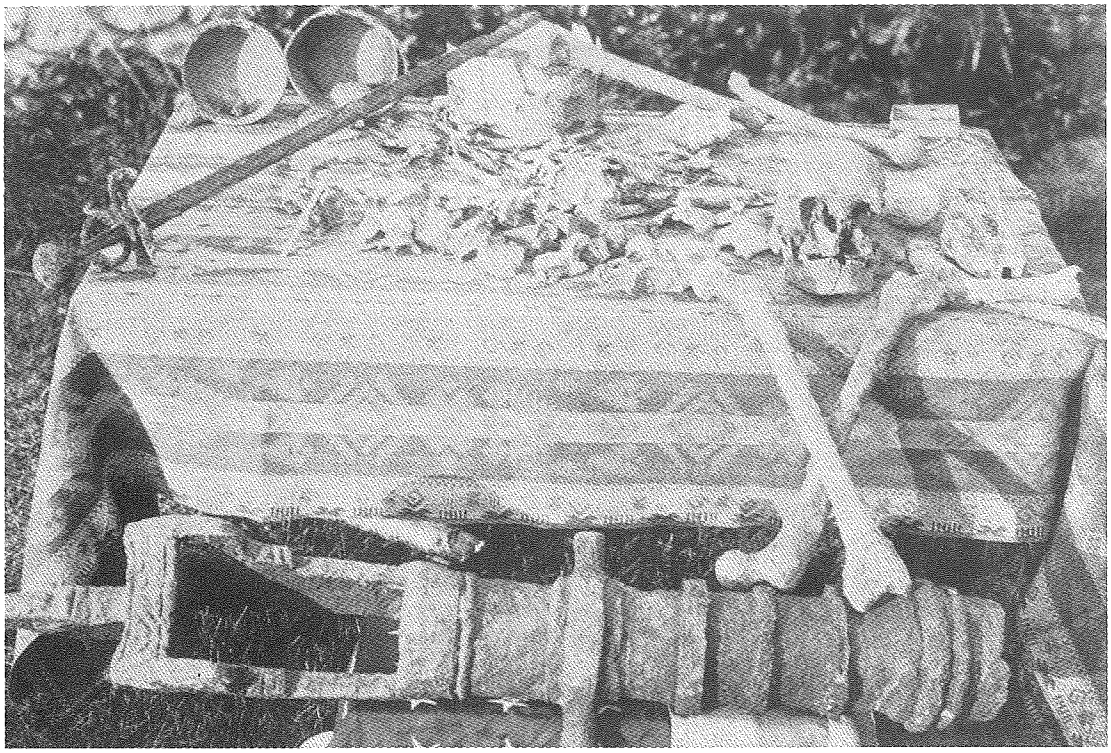
In the next phase of the survey, an attempt was made to locate each of the identified sites. It proved possible to locate about 55% of the sites. Another 30% were located to general areas, and about 15% of the sites could not be located at all.

As might be expected, the cemeteries that were described in detail were generally the easiest to locate. Where the name of the owner of the land on which burials were found was mentioned, it was often possible to trace the property through time to the present, using deeds, wills, and tax records. In some cases where the general location of a site was known, knocking on doors in the area often resulted in locating those sites.

Once a cemetery was located, it was a fairly simple matter to determine its environmental characteristics. Particular attention was given to each site's elevation above sea level, distance from fresh and salt water, elevation above the nearest water source, and the type of soil on which it occurred. Each located site was visited in an attempt to gauge the degree of preservation and to identify any potential threats, such as nearby construction activities.

The information on site location and characteristics was then analyzed, to see how burial customs had changed over time. Generally, it is clear that from Prehistory to the Historical Period cemeteries tended to be located at higher elevations, further from water, and on rockier, less productive soil, with the greatest changes taking place between the Contact Period and the Historical Period. Most of the sites were spread out along the shore of Narragansett Bay and Block Island Sound, within a few kilometers of salt water.

The number of burials found on prehistoric sites averages about four burials per site. For the Contact Period sites, the average is more than 25 burials per site. This



Bones and artifacts recovered from an Indian burial in southern Rhode Island in 1923. Note the breech-loading swivel-gun.

average drops to about 12 burials per site in historical cemeteries. It is not clear why the Contact Period cemeteries were so large. It may be that changes in settlement pattern and exposure to European diseases were important factors.

One of the most interesting aspects of the study was the opportunity that it provided for the study of changing attitudes towards Rhode Island's Indians. Present-day archaeologists and historians are often amused by what they regard as the naivete of earlier scholars, who are regarded as well intending folks who did the best research possible without modern analytical techniques. It is, however, undeniable that today's scholars owe much to ideas that originated in the nineteenth and early twentieth centuries. These ideas are best examined in terms of the context in which they originated.

During the seventeenth century, colonial observers recorded much about the Indian way of life, including burial customs. Puritan observers considered native religious practices to be pagan, but in all fairness it should be said that they felt the same of most religions other than their own. Although the Puritans themselves did not practice religious rites at burial during the early seventeenth century, most Englishmen did. Consequently, some Indian customs, such as blackening the face during mourning, were easily understood by colonial observers.

It should also be remembered that early writers were describing practices that they had either seen themselves or had heard described by others who had witnessed them. As a result, certain customs and beliefs, such as avoidance of using the proper name of the deceased, and the sanctity of burial grounds, often were described as positive qualities of Indian life.

After King Philip's War (1675-1676) Rhode Island's surviving Indians were sold into slavery, most of them within the state. Some were still living in slavery during the eighteenth century, but later scholars may have overestimated the effect that this period of slavery had on Indian culture.

Not much was written about Rhode Island's Indians during the eighteenth century, although by the 1780s an antiquarian movement, patterned after that in England, began to arise in New England. The only Indian burial known to have been found in Rhode Island during this period is the one described at the beginning of this article. The fact that this discovery did not appear in print until 75 years later indicates that scholarly interest in the Indians was not strong or widespread at the time.

Rhode Island's antiquarian movement got off the ground after the founding of the Rhode Island Historical Society in 1822. The major concern of the early antiquarians was with documentary history. The finding in about 1835 of the "skeleton in armor" in nearby Fall River, Massachusetts, provided the first real spark of interest in subsurface evidence. Popularly believed to be the remains of a Norse warrior, partly because of Henry Wadsworth Longfellow's poem, this burial was probably that of an early Contact Period Indian. By the time the dust of controversy had settled, it was clear that subsurface remains could contribute to an understanding of New England's history.

By the 1860s there was a widespread network of antiquarians in Rhode Island. Most of them seem to have been doctors and lawyers who studied the past as a hobby. As they were members of the historical society, it is hardly surprising that their major interest was in contributing to the state's history, and they relied a great deal on documentary sources in the interpretation of their finds. The anti-

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quarians also began to develop a sense of time, however rudimentary. Burials containing only stone tools were recognized as being earlier than those containing European artifacts.

A great deal of information was contained in local histories that were written for the Centennial in 1876. That year also happened to be the bicentennial of King Philip's War, and many writers discussed the events of that conflict, and would often point to archaeological sites as evidence that Indians had once lived in the town that they were writing about.

Nineteenth-century writers were heavily influenced by the then prevalent scientific racism, which held that Indians, blacks, and women were inherently inferior to white males. Many of the antiquarians attributed the downfall of the Indians to racial mixture during their period of slavery, some even going so far as to insist that there were no more genuine Indians in Rhode Island. Thus at a time when General Phillip Sheridan is reported to have said that "the only good Indian is a dead Indian," antiquarians were saying in effect that the only real Indians were dead. This attitude had a great effect on state policy. In 1878, the state erected monuments at Indian Burial Hill in Charlestown, as well as other sites. Two years later, the state legislature unilaterally decided that the Narragansett tribe no longer existed. Only in 1983 did the tribe regain official recognition.

By the first decades of this century, antiquarians were trying to use excavated data to interpret the early history of Narragansett Bay. The presence of Dutch, and possibly French, traders was reflected in the presence of artifacts from those countries in burials. The focus was still on answering historical questions.

With the founding of the Narragansett Archaeological Society (1936) and the Massachusetts Archaeological Society (1939), the focus of antiquarian research shifted dramatically. By the 1940s, these two organizations, probably by default, had cornered the market on the results of archaeological excavations. Their goal was more the answering of anthropological questions than historical ones, and their members tended to be more interested in excavating prehistoric settlement sites than their predecessors had been. The establishment of teaching positions in archaeology at Rhode Island's universities and colleges during the 1950s and 1960s, the change to an explicitly scientific framework of inquiry during the 1960s, and the rise of contract archaeology during the 1970s have given the state's archaeological community its present makeup.

Overall, the cultural context of the burial accounts that have been written during the last several centuries has had a great deal of impact on the usefulness of their data to the burial survey. For example, sites mentioned in nineteenth-century accounts were often easier to find than those that were mentioned after the 1930s. This is because the nineteenth-century antiquarians were writing to inform other antiquarians of the location and contents of burials so that they might see the sites or burials for themselves, while the twentieth-century writers were interested in concealing the location of sites to prevent their being looted.

The best lesson that the Rhode Island Burial Survey has to offer archaeologists is that the documentary record contains a wealth of unexplored data on archaeological sites. The antiquarians, who are often taken lightly by the archaeological community, were often competent observers who have left us a great deal of information about sites, some of which no longer exist.

Lauren Cook, graduate student in the Department of Archaeology at Boston University, has been excavating in New England for over a decade. His interests include documentary archaeology, and the study of seventeenth-century New England settlements, both European and Indian.

Huguenots on the Massachusetts Frontier

by J. Cooper Wamsley

In 1685 King Louis XIV of France bowed to Catholic pressure and revoked the Edict of Nantes, a promulgation calling for religious toleration in his country. This edict had protected the Huguenots, devout French Calvinists, from persecution by their Catholic countrymen. With its revocation came renewed oppression and many Huguenots expediently chose emigration as the proper recourse for their plight.

As a result of trade contacts established in the seventeenth century, Boston was well known to people from the large port towns of western France. It is no coincidence that many of the religious refugees from these towns settled in Salem and Boston and became highly successful merchants. One of these merchants was Gabriel Bernon.

Meanwhile, King Philip's War had come to an end and much of the former territory of New England's native Americans was parceled into tracts and sold. One of these tracts, located in south-central Massachusetts about fifty miles southwest of Boston, was purchased by three Englishmen who sold a portion of it to Bernon. He, in turn, supervised and paid travel expenses for more than forty Huguenots to settle this frontier region. Lumbering along the "Bay Path," the trail leading west from Boston to the Connecticut River, the refugees were on their way to New Oxford in the spring or summer of 1687. They carried with them personal belongings salvaged from their estates and those things many had accumulated during a period of temporary refuge in London. Gabriel Bernon, the settlement's major benefactor, made sure the settlement was well-supplied.

The settlement at New Oxford was an industrious frontier community in existence from 1687 until 1696. During these nine years, a large stone fort, a temple

(church) with an associated small fortification, dwellings, a sawmill, and a gristmill were constructed. A wash leather mill (a mill with a large water-driven, hammer-like apparatus used to tenderize glove-quality leather), in operation by 1703, may also have been constructed in this period.

The fifty miles between Boston and New Oxford, however, was the difference between a comfortable port town and a hostile frontier, and the refugees who settled the latter were exposed to a totally unfamiliar environment. The Nipmuck Indians, who were to be the nemesis of the pioneer Huguenots, inhabited central Massachusetts and northeastern Connecticut, an area that included New Oxford, Massachusetts. There is no evidence that relationships between the colonists and Nipmucks were anything but peaceful during the first three years. By 1691, however, rum trafficking between some of the Huguenots and natives began to cause friction in the settlement. Daniel Bondet, minister of the French congregation at New Oxford and a missionary to local Nipmucks under authority of the Corporation for the Propagation of the Gospel in New England, petitioned against the trade, which apparently continued unabated.

The colony suffered greatly from the effects of King William's War (1689-1697). This confrontation was part of a larger global conflict between France and England that manifested itself in the Massachusetts Bay Colony as a direct conflict between the British colonists and the Indians. The French usually had a significant but indirect role as the coordinator of Indian attacks. Indian hostilities forced the Huguenots to garrison themselves in their fort in 1694. In 1696 a group of Indians massacred John Johnson, an Englishman married to a New Oxford Huguenot, and his three children. The entire community immediately abandoned the settlement and fled to Boston. In 1699 resettlement was attempted by a group of eight to ten Huguenot families who were driven away again by 1704. The resettlement of New Oxford by

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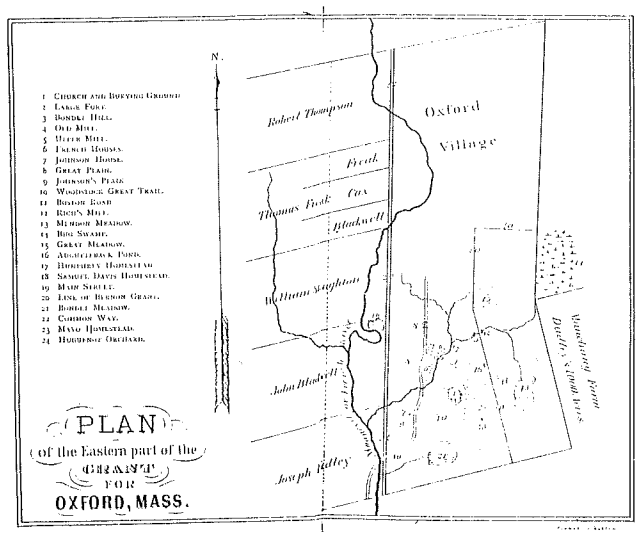
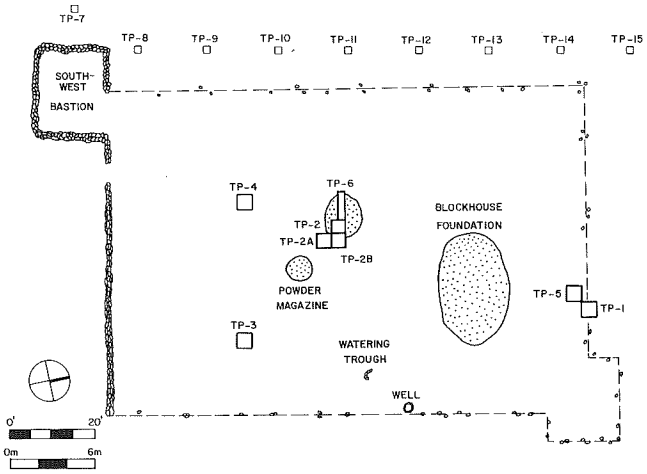
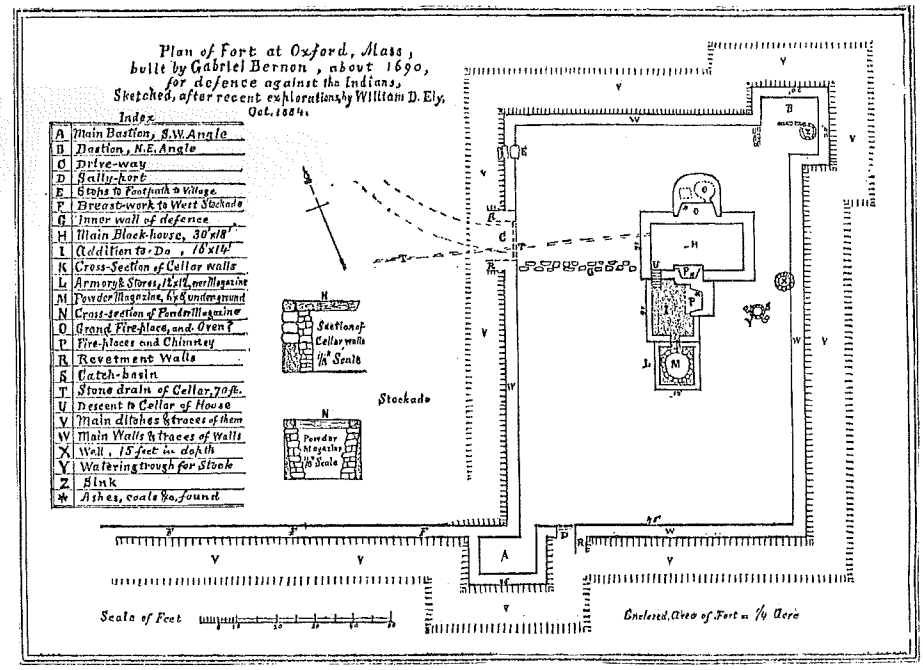


George F. Daniels' map of the settlement at Oxford (from Huguenots in the Nipmuck Country, *1880).*



Plan of the fort, 1984, showing the location of test pits.



William D. Ely's plan of the fort, 1884.

Huguenots was not attempted again.

Archaeological investigations relating to the Huguenot settlement were made possible by a survey and planning grant from the Massachusetts Historical Commission and by a matching grant from the Town of Oxford, Massachusetts, both to Boston University. Investigations, directed by the author of this report, were concentrated on assessing the integrity of the fort site and attempting to locate the Huguenot settlement area, gristmill site, and Johnson massacre site. Despite an exhaustive study of historical records relating to the settlement, no evidence of these latter structures was found. While testing for the location of the settlement area, however, evidence of a fairly extensive prehistoric site, tentatively assigned to the Early Woodland period (3,000 years B.P.), was uncovered. Several hearths, flakes, projectile point fragments, and a preform were found on a bluff overlooking Lowes Pond in the Town of Oxford.

As the most visible and massive relic of the Huguenot settlement, the fort has been the focus of numerous examinations, reconstructions, and, to some extent, excavations, in the nineteenth and twentieth centuries. Limited excavations at the fort by William D. Ely in 1884 resulted in a map of the site that included interpretations of features. The fort today is situated on a town-owned parcel of land and is surrounded by plowed fields on its north and west sides and by grass on its remaining two sides. The most prominent features of the fort include the south wall, southwest bastion, a rubble-lined depression in the location of what Ely interpreted as the fort block house, and a stone-lined well. Poplar saplings, grape vines, poison ivy, and thorns obscure much of the site.

Recent archaeological investigations indicated that, despite disturbances, the fort retains much of its integrity. Excavators who worked along one wall of the fort uncovered intact stone wall foundations approximately 1.2 meters wide. Other excavations within the fort enclosure uncovered an intact corner of what Ely called the addition to the blockhouse. Undisturbed seventeenth-century levels also were found in two test units within the fort's boundaries.

Further excavations at the site of the fort would uncover more information relating to the experience of this poorly understood cultural group in New England. The major theme of current Huguenot research stresses how quickly these people assimilated and the difficulty of tracing their history through documentary research. Once directly in contact with an Anglo-American culture, these refugees rapidly became part of the mainstream society and were no longer traceable as a distinct group. Such notables as the Reveres, Faneuils, and Bowdoins are known primarily for their accomplishments within an Anglo-dominated colony. That they happened to be French or of French ancestry seems to have had no effect on what they were able to accomplish; these Huguenots seem to have been considered as American as any Englishman. Thus further excavations at the fort would lead to evidence that relates to the earliest stage of this process of acculturation which cannot be fully understood from documentary research. Archaeological studies of ethnic groups have received a great deal of attention within the past decade, but have not successfully addressed the subject of the dynamics at work when any two cultures come in contact.

The Huguenot fort is testimony to the fact that these refugees were in direct contact with an aboriginal culture. Contacts between the Huguenots and Indians appear to mirror those of the English and the natives. Friction, caused by liquor and land encroachment, was relevant in this case as it was all over New England. Missionary organizations and their attempts to convert Indians to Christianity also played a significant role in these Huguenot-Indian relations. The conflict between England and France manifested itself at New Oxford in the form of Indian attacks that twice caused the dispersal of the community. Huguenot-Indian relations at New Oxford were not characterized by unique interactions, but were part of a larger Anglo-dominated scheme dealing with settlement and Indian subjugation.

J. Cooper Wamsley is a doctoral student in New World Historical Archaeology, and is currently employed by the Virginia Department of Highways and Transportation (see the article titled "Archaeology Students on the Job," in this issue of Context*). The field crew consisted of John Shea as Field Assistant, and crew members Lorinda Rodenhiser, Jennifer Hills, and Kevin Sharpe. Patricia Crawford analyzed the faunal materials.*

Southwest bastion of the fort, looking southeast.

Historical Archaeology and Interdisciplinary Concerns

by James Wiseman

The text that follows was presented as the keynote address at the opening session of the Annual Meetings of the Society for Historical Archaeology and Conference on Underwater Archaeology in Boston on January 10, 1985.

It is a special pleasure for me to be permitted time here for this brief address because I, like most of you, have been concerned during most of my professional life with the archaeology of historical cultures. True, the historical societies with which I have most often dealt have been rather early in date, but the historical record of the classical civilizations has been at least as rich and varied as any we know.

I am not thinking now only, or even primarily, of literature, important as that is, but rather of documents that record the transactions of daily life as well as those that form the archives of public or sacred offices. Real estate transactions, financial accounts, epitaphs, and court proceedings have contributed directly to archaeological research concerned with the social history of ancient Greece just as they have to archaeological research into the social history of Colonial America, or the early West, or the even earlier West Indies.

The documents are precious; even the choice of language or the choice of detail is instructive. You will all have your own examples to support *that* observation; my own favorite is found in the financial records of the construction costs of the Erechtheum, a temple of the Acropolis in Athens, in the late fifth century B.C. The records are so detailed that we know the name and the amount of pay of the person who carried the paint buckets up the ladders to those who painted the sculptural decoration of the Temple. But the act of recording itself, under the circumstances, is highly informative, for the records I refer to were carved in well-cut letters on fine marble to be set up in a public place. More labor at far greater cost and involving considerably greater skill was expended in making that record than what was represented by the pay that the pot carrier received, a pittance, you may be sure. And all this in the last days of a devastating war, when the inevitability of defeat by their enemy was clear to almost all the citizenry.

Now *there* is a social commentary for you on the significance of labor and of the individual in one society at one time: public recognition was required, even if the record cost more than the task. And lest you think that I am making too much of a single instance, let me assure you that the example is repeated in various forms in other documents that extend over a period of generations. It is understandable in its context; it *is* a reflection of the society.

Documents, of course, constitute only one aspect of what we might call the historical approach in archaeology. And if documents do not exist—that is, even if we are dealing with a prehistoric society—the broad historical approach still may lead us where we want to go. The approach I mean is exemplified by much of the work of V. Gordon Childe, work that Bruce Trigger recently cited as a model that should be adopted by certain American archaeologists of a more philosophical and anti-historical bent. He suggested that they proceed in their attempts to solve such problems as the development of social organization

> not by analyzing isolated fragments of archaeological data, but by trying to understand historical sequences of development in terms of their social, economic, political, and ecological implications.

That is an historical approach with broad significance, and a suggestion we all might heed, whether we are investigating historical or prehistoric societies.

Trigger, in the same work from which the previous quote was derived, was even more emphatic about the dangers of a fragmented study of society and the threat to American archaeology of what he termed "a new form of irrelevance" that comes from

> archaeologists seeking to study in detail isolated aspects of the archaeological record, either as an exercise in technical or theoretical virtuosity, or in order to establish general 'laws' concerning fragments of human behavior. These disparate studies threaten archaeology with intellectual as well as social inconsequence.

The historical approach, we know, does not always find favor in our discipline. There are reasons. Archaeologists sometimes forget that there is historical fact, that certain events did occur at certain times and in certain ways, and that *people* participated in those events. People. Real, living people; not the fantastic array of Barry Fell's travellers in *Bronze Age America*, or the inept ghosts of the so-called "psychic archaeologists"; not even the "Beaker Folk," the Minyans, or the Noble Savage. In the midst of concentrating on archaeological minutiae, or, the converse, on grand schemes of universal application in human affairs, archaeologists forget that there *are* people, that there *is* history.

Things actually happened in the past: not theoretically happened, not just might have happened. The Bronze Age ship that George Bass and his colleagues have been investigating off the southern coast of Turkey actually sank. Its astonishing cargo of glass ingots, tin, copper ingots, ivory, and other artifacts are demonstrably associated with that particular ship, because thay have been detected, recovered, and documented in a controlled archaeological investigation. And the ship itself was built by people in a certain manner that we may now learn and—more—will be able to associate with a specific time and region. Those of us who want to know "What Happened in History" will learn much from the report of Professor Bass at this meeting and from future reports on this shipwreck, one of the most significant archaeological dis-

Continued on next page.

coveries of our generation.

But archaeologists not only *want* to know "What Happened in History," we *need* to know. Without that knowledge we cannot hope to go on to the next step, that is, *understanding* and *explaining* "What Happened in History." We want to know *why* whatever happened happened, because in that way we may understand the behavior of the humans and the societies involved in the events that occurred. Perhaps we may even come to understand what was in their minds.

Even Childe, however, was pessimistic about achieving the latter. Many of you will recall his illustrating some of the constraints (in his view *salutary* constraints) on archaeological investigation by speculating about the manufacturing process of a Mousterian scraper.

> To make a D-scraper, collect a flint nodule (1) at full moon, (2) after fasting all day, (3) address him politely with 'words of power,' (4) ... strike him thus with a hammerstone, (5) smeared with the blood of a sacrificed mouse.

He then pointed out that (1), (2), (3), and (5), as we now know, "are quite irrelevant to the success of the operation prescribed in (4)" and that "It is just these that have been erased from the archaeological record." Good thing, he thought; they were delusions and not worth relearning, even if we could. There may be others of us who are less than stirred by the lost rituals of the Neanderthal. And maybe they are unknowable, after all.

And yet—and yet I keep finding myself reflecting again and again on that passage. Damn it, I *do* want to relearn those lost rituals, those delusions. I would travel in time if I could. The Mousterian toolmaker was no less a part of the humanity that it is vital for us all to *try* to understand than the most renowned builders, or warriors, or the most productive farmers, or those who might have been great but were not, like those buried in Thomas Gray's country churchyard. Those delusions, after all, may be taken to represent all the thoughts, all the emotions, all the concepts of the past that were never recorded or, if they were, whose record was lost.

That passage of Childe, one of the century's great thinkers in matters archaeological and historical, is, then, deeply troubling. Perhaps it was only a rationalization stemming from his perception of our intellectual capabilities in 1956. That is, since Childe could imagine no way for us to gain such intimate knowledge of the origin of a tool, he may have found it more intellectually satisfying to dismiss that particular realm of the unknowable as not worth knowing. And the rationalization does fit, though a bit too snugly, into Childe's Marxist view of "progress" in the historical process.

I want to suggest, since as archaeologists we are seeking understanding and explanation, that we must at least aspire to a knowledge of the mind—even the delusions—and even if the task seems impossible, as it did to Childe in 1956, and as we may perceive it today. I want also to suggest that there is more reason for optimism about what we may hope to learn of the past than Childe then, or many of us now, would have supposed.

Who would have supposed, before Willard Libby gave us the tools, that we would now be routinely dating cultural events of the distant past by measuring radioisotopic decay? Who would have supposed, before Herbert Wright's work with Robert Braidwood in the Kurdistan, that we would be able to determine the natural environment of the earliest farming villages? Who would have supposed, before Peter Throckmorton introduced George Bass to diving, that scientific excavation underwater was possible? Who would have supposed, before Landsat and the shuttle, that remote sensors would detect from space prehistoric riverbeds below the Sudanese desert? Or that similar sensors from aircraft would detect prehistoric roads in Chaco Canyon and raised agricultural fields of the Maya in Mesoamerica?

Advances in scientific technology have resulted in numerous new tools and new techniques that already have opened whole new fields of archaeological inquiry, and made feasible the investigation of problems hitherto considered too vast to contemplate, much less resolve.

The questions I raised a few moments ago serve to provide only a few examples; many more could be added. In all cases they involved intellectual exchange and cooperation among practitioners of two, or three, or several disciplines with archaeologists. It is this integrated, multidisciplinary approach to the study of humans and human society in their contexts, I believe, that offers reasons for optimism. Continued, even increased cooperation across disciplines will surely lead in the future, as it has in the past, to other new fields of inquiry and understanding. And while it is good and practical to ask questions that we know we can answer, it is vital for further advances that we continue to ask—not just dream about, but ask—those questions whose answers still lie just beyond our mental grasp, out of space, out of time.

By now you will have guessed that I do not intend to reveal that someone has developed a method for detecting the blood of a sacrificed mouse on a flint nodule. But I do suggest that through interdisciplinary studies in archaeology, we are closer to understanding the behavior of many of the earlier inhabitants of this world. We shall certainly come closer in the future.

Historical archaeologists, both in the Old World and the New World, coming from a variety of disciplines, and having experienced, as you have, the bright influences of the historical sciences, may now play a key role in this broader, multidisciplinary archaeology. What is more, an historical approach offers the basis for a full and intelligible integration of the intellectual pursuits of many disciplines within archaeology. But communication across those disciplines is vital.

The House of Archaeology, to borrow and slightly transform a metaphor of Kent Flannery, has many rooms. Sometimes the doors to all the rooms seem closed. Let's

open the doors. With direct communication throughout the discipline of archaeology, with direct communication with our neighboring disciplines, with mutual respect for the intellectual contributions of the various fields of archaeology, with the continued development of integrated and multidisciplinary approaches to the study of the human past, we may yet come to know not only what happened, but why. We may yet come to know what was in the minds of those whose cultures we explore.

Further Reading

The works cited in the text are: Bruce G. Trigger, Gordon Childe, Revolutions in Archaeology *(Columbia University Press: New York 1980) 183-184; V. Gordon Childe,* Piecing Together the Past: The Interpretation of Archaeological Data *(London 1956) 171-172. See also: V. Gordon Childe,* What Happened in History *(Harmondsworth 1942), and Ruth Tringham, "V. Gordon Childe 25 Years After: His Relevance for the Archaeology of the Eighties,"* Journal of Field Archaeology *10 (1983) 85-100. The building inscriptions of the Erechtheum can be found in Gorham P. Stevens, et al.,* The Erechtheum *(American School of Classical Studies, 1927), and William B. Dinsmoor, "Attic Building Accounts, II. The Erechtheum,"* American Journal of Archaeology *17 (1913) 242-265.*

Archaeology Students on the Job

by Fritz Hemans

It seems only yesterday that *Context* carried the announcement of the formation of the Department of Archaeology at Boston University, but in fact it has been in existence now for three years (see *Context* 2:2 [1982] 2-3). In 1982 the Department officially replaced the interdepartmental Archaeological Studies Program that had been formed in January, 1979. Our growth in the brief time since then is reflected in the large number of graduate students that have enrolled in the program (enrollment in 1984-85 was 37) and in a faculty that now numbers nine, in addition to Research, Visiting, and Adjunct Professors. These numbers, however, are only the 'tip of the iceberg' if we are to count the people who have participated in the Center's workshops, colloquia, and field schools; and undergraduates in the Department this past year totalled 70 (31 majors and 39 minors).

To many of the students who have enrolled here, however, the years spent at Boston University are only a prelude to careers in archaeology that take them elsewhere. Two of our graduate students have recently entered another archaeological world: applying the training acquired at the University to cultural resource management projects in Virginia and Delaware. They have sent us brief reports on their progress to share with readers of *Context*.

Graduate student J. Cooper Wamsley was recently hired by the Virginia Department of Highways and Transportation on a full-time basis to perform cultural resource management work. Whenever a highway project is planned, archaeological resources in the vicinity of the project must be identified and any impact to sites must be evaluated in terms of federal and state environmental protection legislation. Wamsley's responsibilities involve identifying sites, making recommendations regarding site significance, and mitigating impacts to significant sites. A native of Virginia, Cooper is familiar with the state's history and prehistory and enjoys the opportunity to do fieldwork all over the Old Dominion. He has been heavily involved with approximately sixty highway projects to date, ranging from small bridge replacements to a new seven-mile-long road alignment.

Virginia is one of many states that now have full-time highway department archaeologists. These state agencies have found that having cultural resource management work done by in-house personnel is more cost effective than having to hire consultants for every project. In Virginia, consultants are still used for some major mitigation efforts, but most archaeological work is accomplished by highway personnel. For those projects where outside help is necessary, Wamsley helps evaluate the proposals and archaeological work of consultants.

Conrad M. Goodwin, graduate student in the Department of Archaeology, formerly Programs Coordinator of the Center, and co-director of the Galways Plantation Project, began a new job in mid-January as the City Archaeologist of Wilmington, Delaware. His task for the nine-month period of the post is to create a plan for the management of the city's archaeological resources for the Planning Department. The position is funded by a federal survey-and-planning grant administered by the Delaware Division of Historical and Cultural Affairs with in-kind support provided by the City of Wilmington.

Wilmington has begun a major program of urban renewal and development, and the targeted areas are also those that contain most of the oldest historical resources, both standing structures and subsurface remains. "Perhaps the major aspect of my job," says Goodwin, "is to inform the city where the critical resources are located so that appropriate mitigation procedures can be planned for, prior to demolition and development."

To do this requires the creation of a research design and 'study units' appropriate to Wilmington. Study units are a model of the historical development of the city divided into manageable blocks with geographical and chronological boundaries. For example, one study unit is Eastside during the period 1630 to 1730; Eastside is the location of the earliest European settlement in Wilmington. A research design or series of specific questions has to be formulated for this study unit. The next step is to study the documentary record for Eastside to see the impact the city's growth has had on the area. This will provide a preliminary assessment of the integrity and significance of the archaeological resources for the study unit that may remain to answer the questions of the research design.

The final steps in the process are to test in the field the preliminary assessments and to synthesize the results into a practical management plan that city planners, the state historical preservation office, archaeological contractors, the academic community, and the people of Wilmington can use.

Ceramic Analysis and the Personal Computer: A Case Study from 'Ain Dara

by Paul Zimansky and Elizabeth C. Stone

More than one archaeologist in the Near East has been overwhelmed by the sheer quantity of pottery coming out of the ground. No other artifact category comes close to being so abundantly represented at most post-paleolithic sites, and none takes up so much of the excavator's time. The flood of potsherds can clog both the bureaucratic machinery and the intellectual circuits of the modern excavating team, and lies behind some of the great scandals of publication failure by otherwise responsible archaeologists.

To give an example of how great the problem can be, let us consider some figures from the Boston University/SUNY Stony Brook excavations on the lower mound at Tell 'Ain Dara in northern Syria (see *Context* 3:3 [1984] 8-9). This is a small-scale operation in which a staff of four Americans and a Syrian crew of roughly fourteen men and women are currently excavating an area of less than 200 square meters. In two seven-week field seasons during the summers of 1983 and 1984, we have removed approximately six hundred cubic meters of soil, of which roughly fifteen percent was material disturbed by modern cultivation. More than 129,000 sherds were found in contexts clear enough to make them worth recording, and of these 13,724 were "diagnostic" in the sense of being either rims, bases, or handles, or having some form of decoration that would make them useful chronological/functional indicators. Analysis of this artifactual harvest is obviously no minor task.

In a more carefree era of archaeological research, "humble potsherds" caused few problems—one threw them away. The ceramic inventory of a site would at best be portrayed in the form of a typology based on whole pots, which are rare outside of cemeteries. Granted, "interesting" sherds (those with unusual decoration, or clear imports) might be illustrated and study collections were often retained, but by and large, in the heroic era of Near Eastern archaeology, the more prosaic sherds wound up in the dump, unrecorded.

No modern excavation, of course, would countenance such a policy; full recording of sherds is now the norm. The price that one pays for this heightened concern, however, is a substantial commitment of time, energy, and money, often through the labor of full-time ceramic specialists and elaborate computer studies. Ironically, the current trend in archaeological theory is toward increasing skepticism about the cultural inferences that can be made on the basis of this kind of evidence. Pottery, after all, often appears in secondary contexts that relate in complex and indirect ways to actual pottery use in antiquity. Statistically it is tricky since its quantifiable aspects are apt to be culturally irrelevant; inadvertent strokes of the pick, for example, may increase a sample size by an order of magnitude. Every archaeological project is an exercise in pragmatism, and the director must weigh the cost of each form of analysis against its dividends in information. Under such circumstances, any means of facilitating record keeping, increasing the number of questions one can ask, reducing the amount of time one has to wait for answers, and expanding the amount of data one's research can encompass is worth exploring. It is not surprising that the personal computer, with its enormous potential in these regards, has already found a niche in archaeology.

Excavation in progress at Tell 'Ain Dara.

It is this pragmatic aspect that we wish to stress. Computers have been around for a long time and their effectiveness in analyzing ceramic data has been convincingly demonstrated on numerous occasions. The inexpensive computers that are now available are extending the range of archaeological research, in some cases by accompanying the archaeologist into the field. At 'Ain Dara, however, portability is not at issue. There is neither a regular source of electricity nor means of protecting delicate instruments from the characteristic high temperatures, winds, and dust of the summer. Even under these conditions, microcomputers have certain advantages that enable the small-scale archaeological project to avoid the Scylla and Charybdis of either squandering an unreasonable percentage of its resources on sherds or giving them short shrift.

We are certainly not in a position to disregard pottery. It is more than a chronological indicator in the 'Ain Dara project, which is seeking to document social and economic change in the Dark Age that followed the collapse of Bronze-Age civilization in the eastern Mediterranean. Ceramic evidence reflects a general and striking tendency for the cultural uniformity that characterized the Levant at the beginning of this period to break up, creating a new pattern of regional diversity. Local typologies often prove inapplicable to sites only a short distance away, and each excavation requires its own study. The crucial problem of how various principalities in northern Syria related to each other and the outside world cannot be evaluated without some fairly detailed work. Given these

Typical diagnostic Iron Age body sherds with painted decoration. Each type of decoration has a numerical code.

priorities and limitations, the home computer has become an integral part of our research design.

Our field procedure is to wash, classify, count, and weigh all excavated sherds. For each diagnostic piece a form is filled out, categorizing its shape, fabric, paint and ware color (according to Munsel code), tempering material, decorative motifs, etc. Everything that does not fit into the typology is drawn, and a color photograph is taken of all the sherds for which this would show anything. In the evenings after excavating and on the Friday "weekend," the entire staff devotes itself to this work, along with conservation, registration, flotation, and shopping for supplies.

The suitcases of forms generated by each field season constitute a data base that could of course be entered into any computer. It was our initial assumption that we would be putting them into a large "mainframe" computer, and Charles Pennington at the Department of Archaeology at Boston University did just that, with one thousand of them, in the spring of 1984. This pilot project was perhaps more useful in what it told us about computers than about Iron-Age pottery. The information for selected variables on the field cards was entered as a string of numbers, monotonous to type out and frequently garbled because they were not the kind of thing to keep Pennington's mind alive.

The walk from the terminals at which we were working and the computer center to pick up printouts, not to mention printing delays during more active times of day, created a gap between the posing of questions and receiving the answers. If a partial analysis of only one-tenth of our material had taken up several months, was there any realistic hope that we would be able to process the rest as fast as it came out of the ground?

We soon came to appreciate that microcomputers have advantages over mainframes in two important ways. First, any idiot can use them. The development of "user-friendly" programs has been primarily aimed at the microcomputer market; as a result, potential complications of data input have been greatly eased. Second, and more importantly, microcomputers are much more interactive than mainframes. Using a "data-base management" program such as *DBase II* one can survey data and correlate variables quickly instead of waiting for output at the computer center. Cutting out this time-lag makes possible a dialogue in which a line of questioning can be pursued to its logical completion by making the computer subject to something more like an oral than a written exam. Relationships can often be probed without asking formal questions by reviewing selected aspects of the data base. The extensive and pointless excursions down blind alleys into which the misdirected computer is apt to wander are cut off with a simple command to shut up. None of the greater intellectual advantages of the larger computers is lost by working at home,

Continued on next page.

Computer with display of frequencies of one type of pottery in each microphase.

Some forms our typology was not ready for, but if we ever find another Neo-Hittite shower head, we'll have a place for it.

since data entered on a microcomputer can easily be transferred to a mainframe for more sophisticated analysis.

Using a *DBase II* template to record the data on each sherd card, the authors were able to log in virtually all of the quantifiable information on more than ten thousand diagnostic sherds in less than a week over the Christmas holidays. This was only a fraction of the time that would have been required to enter the long strings on *SPSS-X*, and the task was not particularly onerous—most of it was accomplished in pleasant surroundings while watching television. The two *Kaypro* computers at our disposal each cost less than a round-trip air fare to Damascus and could be pressed into service for other excavation-related correspondence, sifting through artifact inventories, and indexing field notebooks.

The actual analytic work is currently proceeding apace, using a statistical program known as *Abstat*. We have generated type frequencies for each of the twenty microphases of occupation in the lower tell so far uncovered, and histograms of rim diameters for each form have refined the definitions employed in our typology. The correlations between paint and ware colors also suggest chronological groupings that we had not caught by visual inspection as we were processing the material in the field. What is emerging is a very detailed picture of ceramic diversity and change in a period for which archaeologists in the past have had to throw up their hands. Individually the sherds are quite boring, but in the aggregate they are producing a solid base of useful information.

The software literature for home computers is now so vast and hardware so diversified that there is no point in outlining the specifics of our work. Far more elegant programs and machinery are available even on the home computer level, and what one uses for a given project will undoubtedly depend on what is available. The point is not that any of this is marvelous or sophisticated—quite the reverse. It is the very simplicity, economy, and modest amount of training required that gives these machines their greatest potential. They reduce the task of statistical analysis of mundane sherds from a grand project to a routine chore, and make it more likely that the work will actually be published by the excavator than relegated to an as yet unborn student who will lay claim to a Ph.D. for cleaning up the mess.

Paul Zimansky is Assistant Professor of Archaeology in the Department of Archaeology at Boston University and Elizabeth C. Stone is Assistant Professor of Anthropology at the State University of New York, Stony Brook. They are Co-Directors of the 'Ain Dara project.

The Center for Archaeological Studies, which was founded at Boston University in 1980, has as its chief aim the development and coordination of interdisciplinary archaeological programs in education and research on local, national, and international levels. The Center also seeks to increase national and international awareness of the importance of understanding other cultures, and of preserving the world's cultural heritage, by involving professional archaeologists, scholars in other fields, and the general public in the activities of the Center.

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