PLEISTOCENE MAN IN FLORIDA

W. A. Cockrell and Larry Murphy

Introduction

Intermittently, during the past six years, the principal author has worked at Warm Mineral Springs, Florida (8So19), a 70 m deep vertical cavern which was dry during the terminal Pleistocene and is now submerged, due to the ground water rise which accompanied the Holocene sea level rise. (Fig. 1). Preservation of perishable material is enhanced by the constant 86°F spring fed anaerobic waters. A ledge 13 m below present water level has produced a human burial (Fig. 2) dated ca 10,310 radiocarbon years before present (Cockrell 1973a, 1973b, 1974a, 1974b, 1974c). Figure 3 is a Table of 16 radiocarbon samples from one laboratory from the general area of a human burial; two from another laboratory are in the same range. Recovered with this burial was a worked shell spear thrower spur, the first evidence of such compound tool used in North America (Fig. 4a). A number of artifacts have been recovered from 8So19 by Col. William Royal, the discoverer of the site (Fig. 4b). Col. Royal also recovered skeletal elements of at least 12 individuals and a skull containing what was apparently preserved brain tissue (Royal and Clark 1960). Prior to the inception of the present project a 1 m test trench was excavated by Carl Clausen in 1972 (Calusen et al. 1975), but the principal of those excavations incorrectly assumed that the deposits containing human remains were all wet-deposited. Present research proves that at least some, if not all, of the 13 m ledge deposits were dry deposited, and that Burial 1 was an intentional flexed burial, covered with two calcium carbonate dripstones, (Cockrell 1973-1976, n.d.).

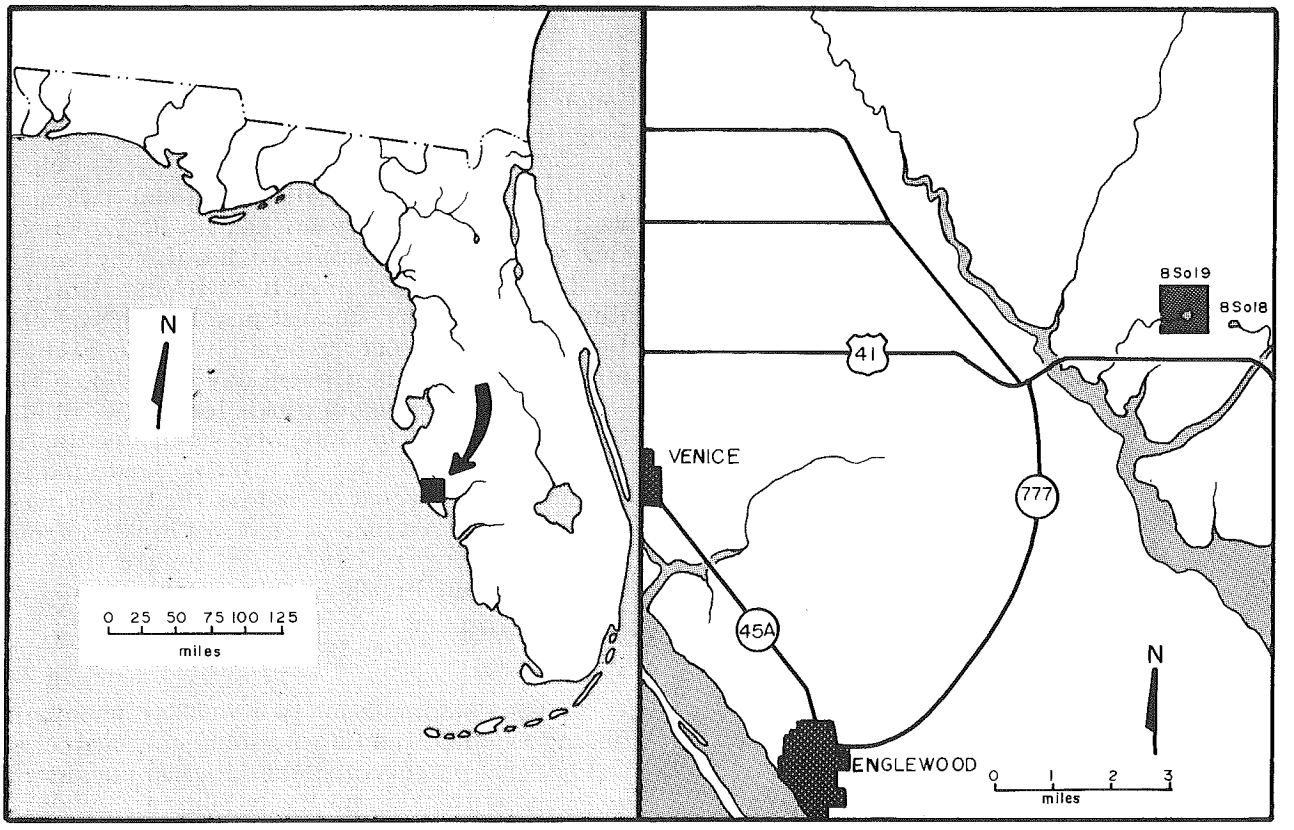
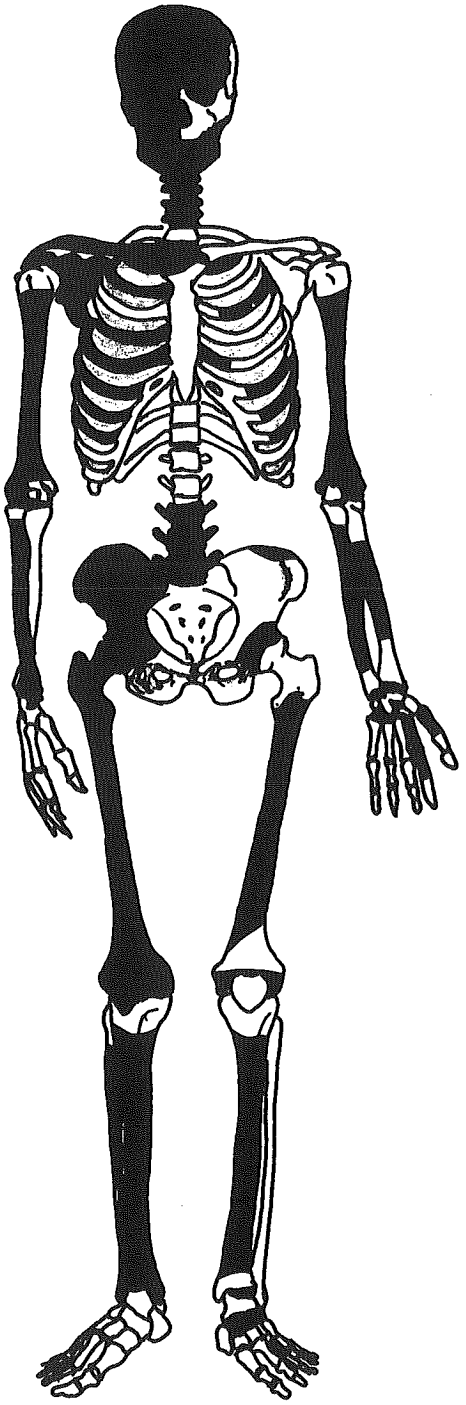


FIGURE 1. Location of Warm Mineral Springs 8So19.



Recovered parts are solid.

BURIAL NO. 1 8So19

SKELETAL ELEMENTS PRESENT

FIGURE 2

Current Research

Recent field seasons have concentrated on the collection of paleoecological data, especially during the multi-disciplinary excavations of 1974, 1975, and 1976. We have recently been attempting to utilize these data and geological evidence (Emery and Edwards 1966; Shepard 1964) to locate other sites of the terminal Pleistocene-early Holocene horizon in peninsular Florida. This recent information, as well as current sea level change data, largely ignored by archaeologists until this decade, has contributed to changes in our basic conceptions of these early sites, as well as our model for site location. Climatological data based on the well preserved macrobotanical materials from 8So19 (Sheldon 1975, 1976; Sheldon and Cameron 1976), supported by palynological profiles of James King of the Illinois State Museum, (King 1975) and others (Watts 1969, 1971), indicates that, at one time a drier, cooler environment with a remnant deciduous forest extending down into the peninsula. Many minor fluctuations are reflected in the data but at one time, at least, a more arid condition prevailed.

A precise chronology for these changes has yet to be worked out, but the general range for this fluctuating condition is about 10,000-15,000 BP, during the terminal Pleistocene. The sea level was then at least 30 m and possibly as much as 100 m below the present level (Fairbridge 1974).

A model for the location of early sites must take into account climatological data as well as the effect of lower sea level. We speculate that since the peninsular fresh water hydrostatic head is related to the sea level (Cockrell n.d., Kohout 1966, 1967, Hearst p.c.), at lower sea levels many present surface rivers would disappear, much as in present day Yucatan. This would leave a series of sinkholes which could then become foci for intensive human utilization. Fluctuations of sea level, climate, and land forms seem to have leveled off before the appearance of the classic Archaic period in Florida, around 6-5000 BP (Cockrell 1970, Fairbridge 1974, Scholl and Stuiver 1967, Shier 1969).

New Directions

The contemplation of recent archaeological findings against the latest geological, hydrological, and general paleoecological data has considerably altered our thinking on Early Man in Florida. Early sites have indeed been found in the past but they were definitionally and conceptually dis-

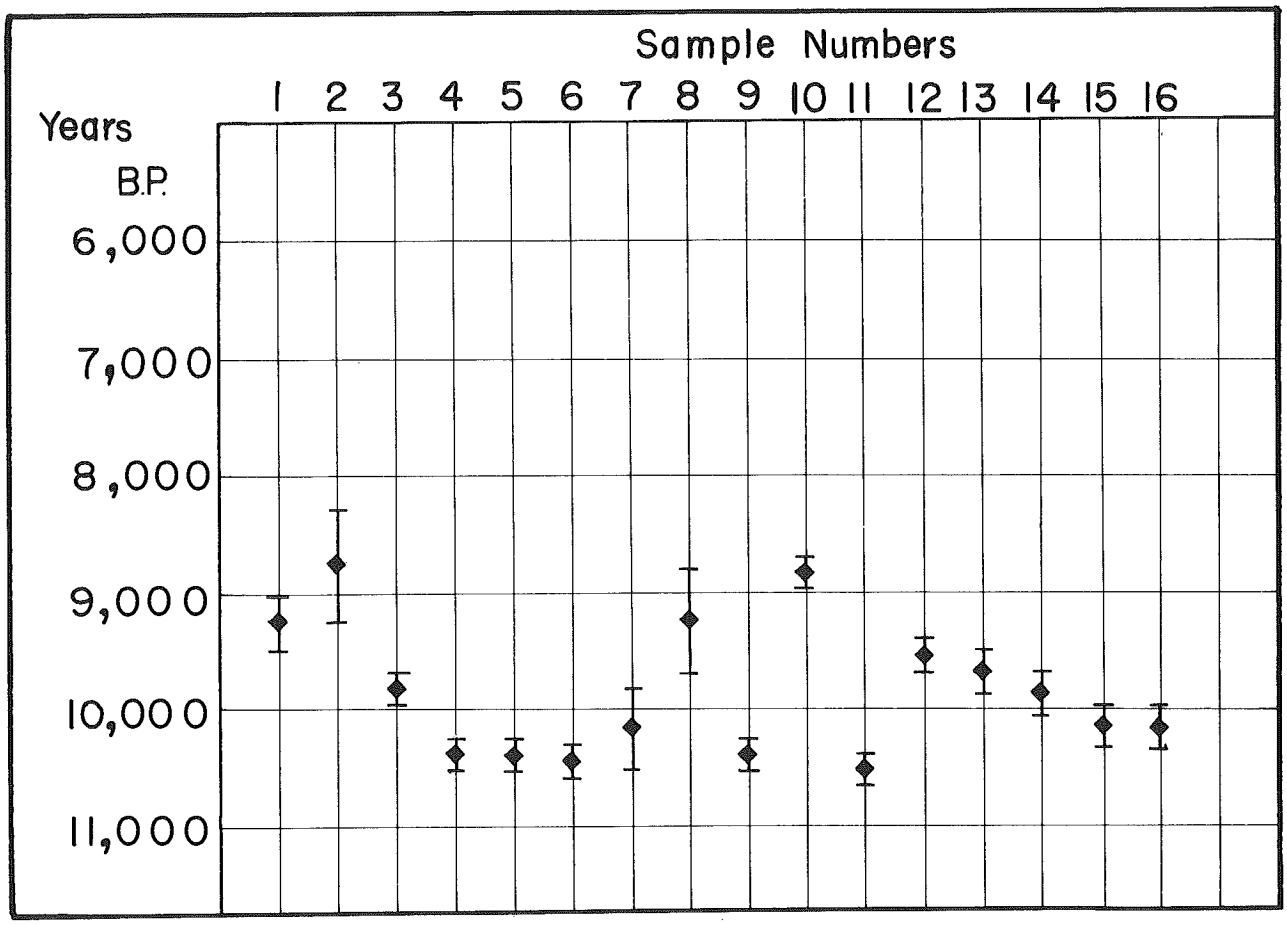


FIGURE 3. Radiocarbon Dates from Burial 1 8So19.

counted by early investigators. Sites such as Vero Beach (8Ir9) and The Melbourne (8Br44) location were found with human remains in direct association with extinct Pleistocene fauna (Sellards 1916, 1917). But Ales Hrdlicka in BAE Bulletins #33 and 66 (Hrdlicka 1907, 1918) as well as in the *Anthropology of Florida* (Hrdlicka 1922) discounted these, as well as all other claims for the great antiquity of humans in the Eastern United States.

Hrdlicka examined and discounted each claim basically on the then common geological definition of the end of the Pleistocene as occurring at ca 20,000 BP (Hrdlicka 1918); it was then commonly accepted that native Americans came into Florida ca 2000 to 5000 BP. This presented no logical problem when human remains were found in association with extinct Pleistocene fauna, as it was simply assumed to be some sort of accidental or intentional mixing, or perhaps poor field work. These conceptual and definitional restraints were in effect as late as 1969 when the principal author, as a graduate student in anthropology, was taught that the Vero and Melbourne human remains were Archaic, and no older than 3000 BP. There are other sites as well, some which have not received the attention that Vero and Melbourne have. One such is near Sarasota on the Gulf Coast; a cranium was recovered in the 1920's on Phillippi Creek which, when sent to the American Museum of Natural History, was judged by George Gaylord Simpson to be late Pleistocene, based on the features and state of mineralization (Simpson 1932). A site further south, just north of Naples, on Big Hickory Island Pass (8Cr190), produced a fully flexed human burial encased in a limestone marl uncovered by beach erosion. This site has, unfortunately, been since destroyed by accelerated erosion (Cockrell and Murphy 1978a, 1978b).

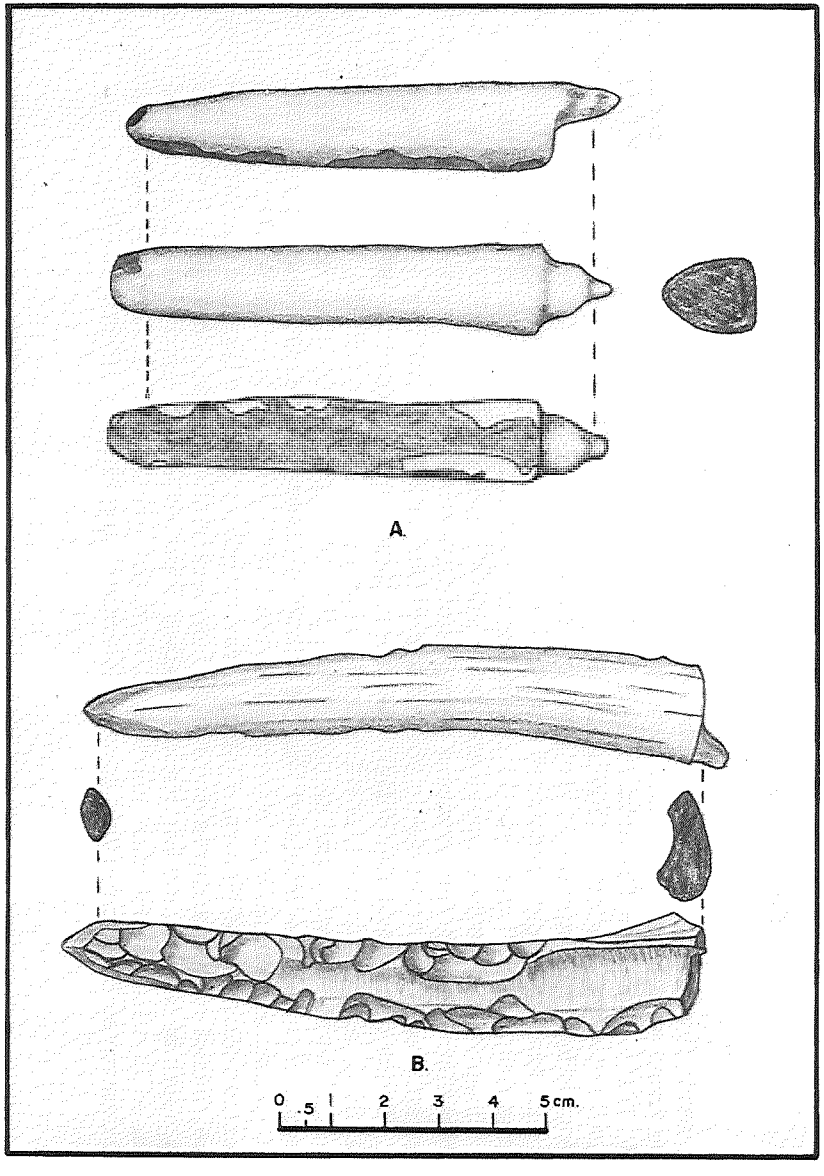


FIGURE 4. A. Spearthrower (Atlatl) spur of carved shell from Burial 1 8So19. B. Fossil bone multiple-use tool (polished and pressure flaked) recovered by Col. William Royal from 13 m ledge 8So19.

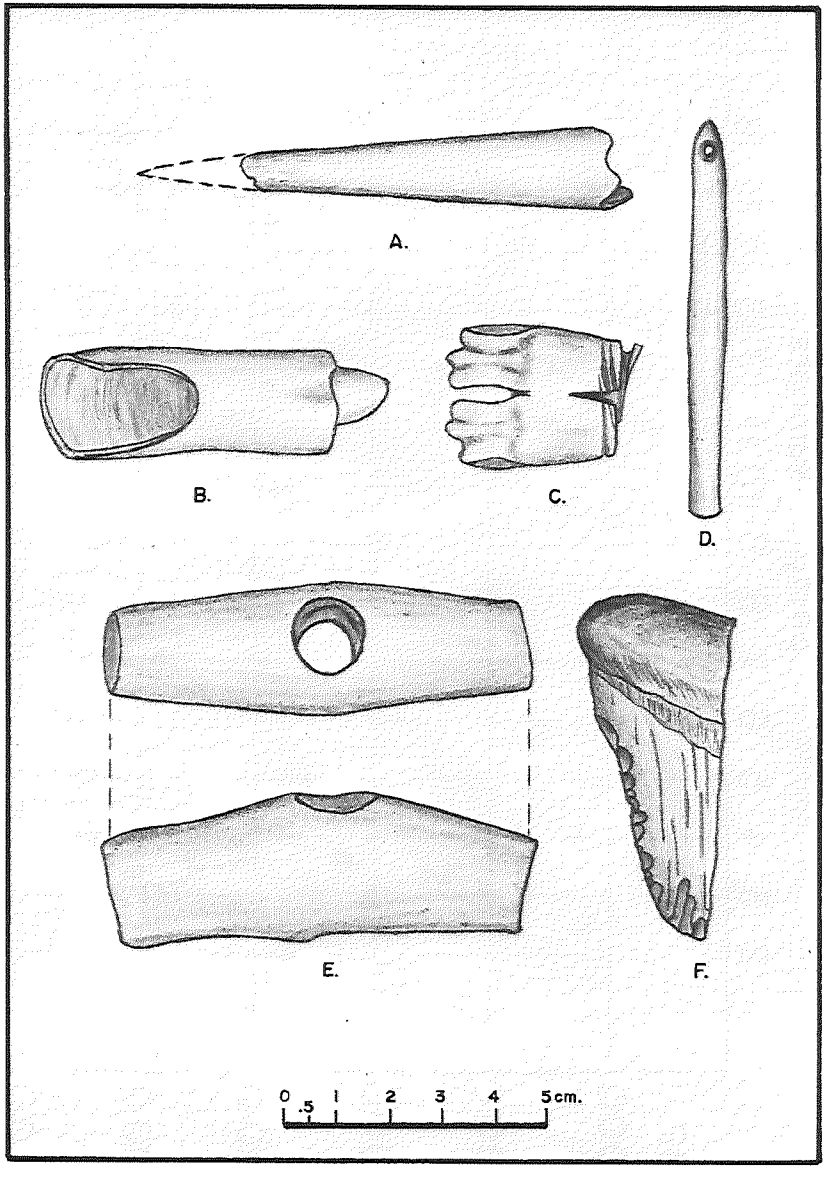


FIGURE 5. Artifacts recovered by Col. William Royal from 13 m ledge 8So19. A. Worked antler object; B. Worked bone object; C. Cut deer bone; D. Polished bone needle; E. Worked bone (possibly spearthrower related); F. Fossil shark's tooth with intentional pressure-flaked edge.

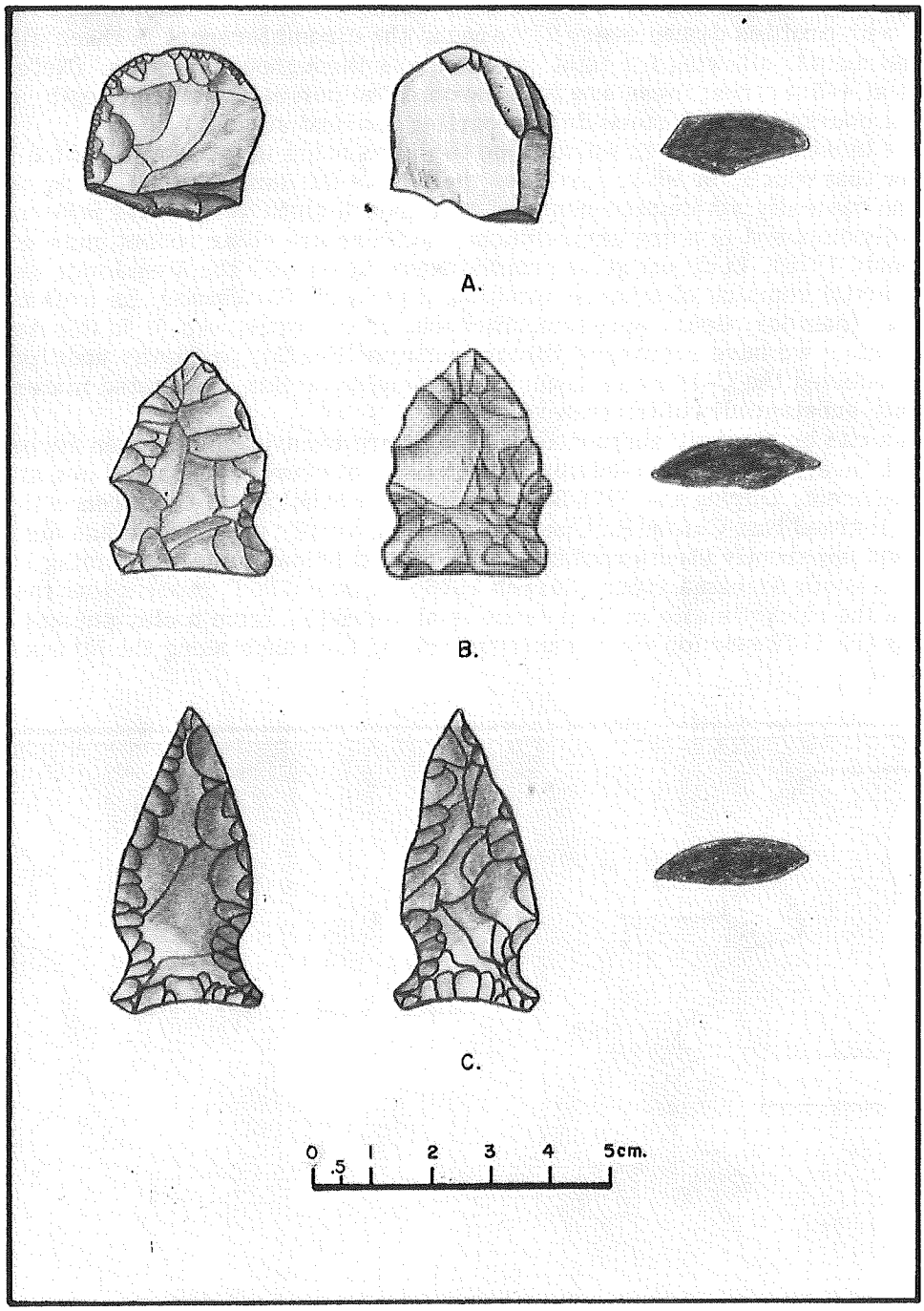


FIGURE 6. A Scraper recovered from Feature 44, land excavation 8So19. B. and C. Projectile Points (Greenbriar type) recovered by Col. Royal from 13 m ledge. (A third Greenbriar type point was stolen) All three exhibit basal and lateral grinding.

Recent Developments

We will turn now to some recent developments from Warm Mineral Springs which are relevant to these early sites and the model of site location which we are developing. A cross section

of the Springs (Fig. 7) is a result of recent field work; the site has been mapped from 20 m to the surface, with profiles drawn every 15° around the circumference. A three dimensional grid has been constructed, allowing for tight data controls throughout this area. (Note the presence of stalactites at 4-5 metres; these are found around the perimeter at this depth, at 13-15 m, and at 32 m; all of course, were formed during earlier lowered stages.)

We have most recently been working on the 13 m ledge in the stratigraphic layer (Fig. 8) directly below that which, in 1973, produced the 10,319 BP human burial, from which we are recovering the basically articulated remains of a ground sloth *(Megalonyx jeffersonii)*; it apparently had decomposed in a dry environment, as there are clear rodent gnaw marks on the fibula (McDonald 1976). In direct stratigraphic association with the Megalonyx we have recovered the partial remains of a sabre-tooth cat *(Smilodon floridanus)*, as well as a number of extant species, (panther, deer, opossum, raccoon, frog, turtle, etc.). In this same gray-green clay stratum we have recovered human remains (Fea33), presently undergoing analysis. We have not received the C-14 dates from wood samples on this associated material yet, but it is apparently substantially older than 11,000 BP.

The data can be strongly supported, as the entire excavation has been recorded on video tape (Cockrell, n.d.). The faunal-human association, of course, attracted our attention to the earlier sediment. During the 1976 Southeastern Archaeological Conference in Tuscaloosa, Alabama, we learned that Cailup B. Curren of the University of Alabama had also discovered Pleistocene and apparently stratigraphically associated human material coming out of a gray-green clay in a south Alabama river (Curren 1976). Mason (1962) reports that the Paleo-Indian material from the Nuckolls site in Tennessee is also eroding from a clay subsoil layer. Upon our return for the 1977 session we began investigating the banks along the Myakka River; a

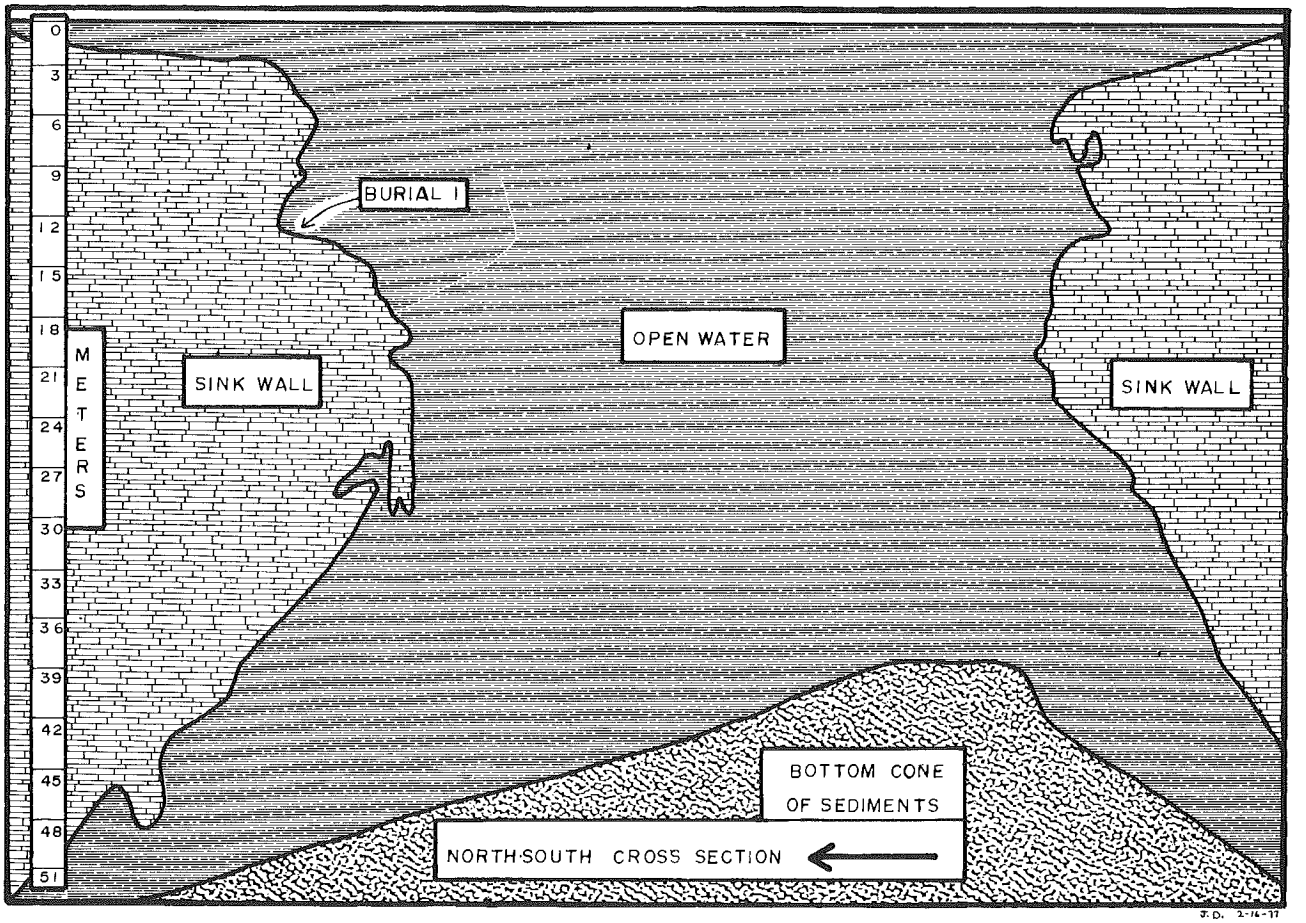


FIGURE 7. Cross section of Warm Mineral Springs 8So19 (vertical scale compressed).

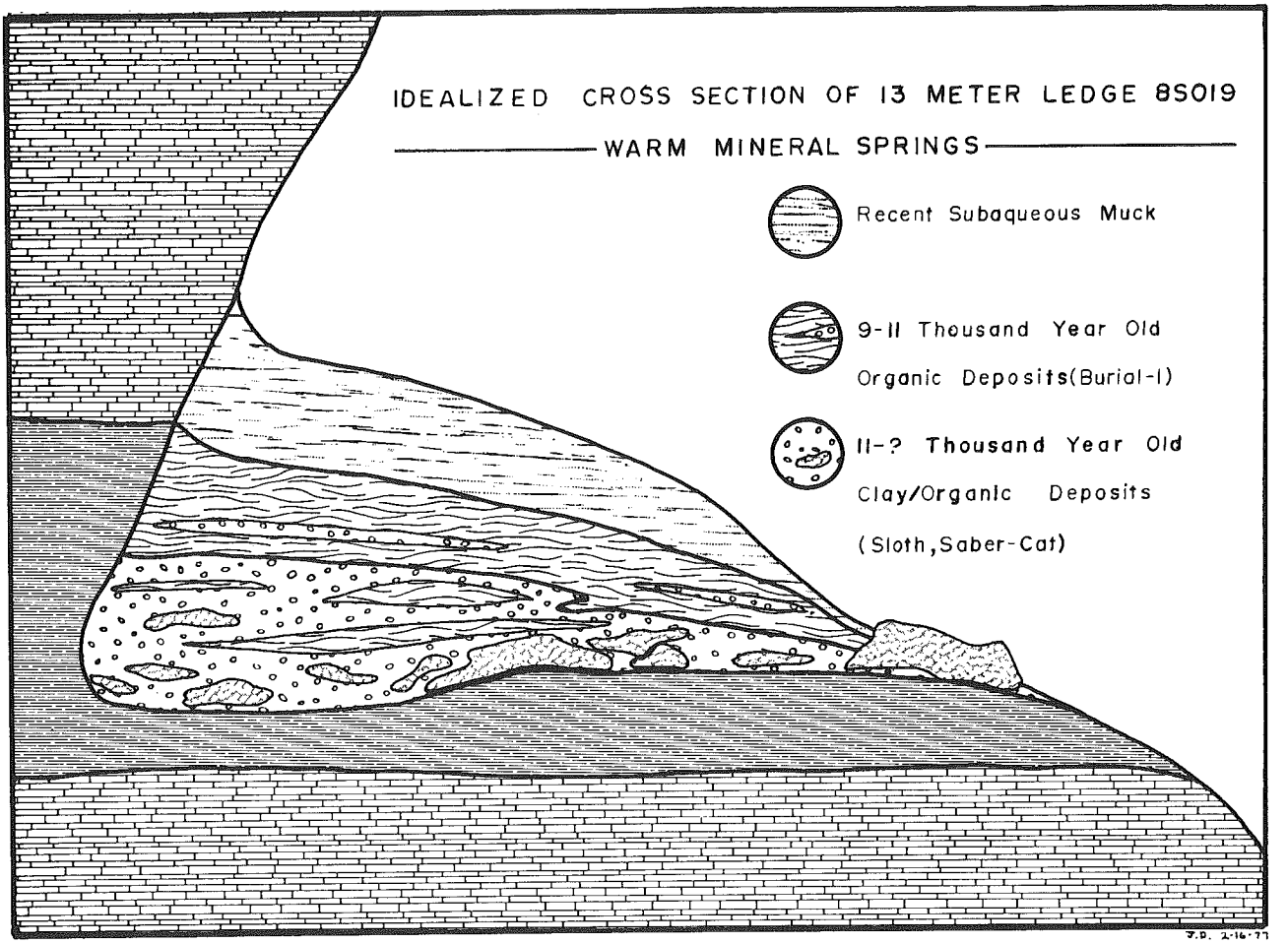


FIGURE 8

scant 5 km from Warm Mineral Springs we located a gray-green clay outcrop (8So32) where fossils and tools were located. One of the tools was a fossil whale otolith which had been worked into a scraper, with multiple secondary chipping. Another tool was made from a mineralized large mammal bone, possibly proboscidian. We also found remains of proboscidians and Pleistocene horse in the area. Pleistocene horse and camel remains had previously been located in the terrestrial site at Warm Mineral Springs, in the same post or terminal Pleistocene aeolian sand stratum as a lithic workshop containing a scraper and debitage of pressure flaking. (Fig. 6a). It is considered possible that these clay and sand deposits were contemporary, reflecting differing microenvironments or, of course, that they reflect different temporal horizons. Further paleo-ecological studies are planned, to lend more precision to the context.

Upon examining the late 19th and early 20th century literature pertaining to the sites of this southwest Florida area we learned that possible early human remains had been found at Nokomis and Osprey at 4 different locations, as well as the Phillippi Creek Locus previously mentioned (Leidy 1889, Dall 1887, Heilprin 1887). Hrdlicka reviewed these finds, but in each case the bones had been removed prior to his investigation. One important fact did emerge however; in Hrdlicka's stratigraphic map he depicted the human material as lying at the interface of the humic sand and marl (Hrdlicka 1918).

The physical anthropological evidence from the four unit population recovered from 8So19 lends further credence to the authenticity of some of these potential early sites, and the gray-green marl as being a possible marker for the location of early sites. (The study of the 8So19 skeletal material was conducted by, and under the supervision of, Donald Morris of Arizona State University.) The physical type was found to be different from the subsequent Indian popu-

lations of the Southeast, having greater similarity to early Archaic, Punin, and Choukoutien 101 crania than to recent prehistoric crania (Morris 1975, Seybart 1975). It should be pointed out that the population is morphologically different than the population of Little Salt Springs (8So18), a short distance from Warm Mineral Springs, where the dates of habitation are ca. 5000 to 7000 BP (Clausen p.c.). It was found that the cranial indices of the Warm Mineral Springs material, when compared with the previously discounted early remains of Vero and Melbourne, were similar to the Tranquility population, also thought to represent one of the earliest skeletal populations of North American Indians (Angel 1966).

Site Location Model

We are using this background material to develop a model for site location both inland and offshore. Inland we are particularly interested in karst sinkhole and submerged cave locations as possible early man sites, and are developing the methods for a state-wide survey and sampling of these regions. Sinks and submerged caves may be found in the open, and in the beds of present rivers, as well as offshore, as inundated marine springs and sinks. Sinks and caves offer a high potential for the presence of intact, well-preserved sites, since they have, until recently, been less accessible to disturbances by land development and looting (Lenihan and Murphy 1976). Certain Florida sinkholes have already produced large concentrations of Pleistocene material, such as Wakulla Springs in North Florida.

This spring was one of the first worked in Florida, with hard hat divers removing an entire mastodon skeleton in the 1930's (now on display at the Museum of Florida History, in Tallahassee) and with later investigations producing much paleontological and cultural material (Olsen 1958). Silver Springs and Hornsby Springs (Dolan and Allen 1961; Hoffman p.c.) have both produced Pleistocene fauna and cultural materials. In the early 1960's John Goggin investigated underwater sinks and caves at Warm Mineral Springs, Devils Den, and Jughole Springs of the Ichetucknee River in Florida (Goggin 1962, Gluckman 1967) and found Pleistocene fauna and cultural materials at each location. Of these recoveries of extinct megafaunal and human remains, the contemporaneity of the materials has been largely unproven, or is unprovable, with the possible exception of the Silver Springs finds.

Through the 1968 work of George Fischer in Montezuma's Well in Arizona (Fischer 1975), Reynold Ruppé's work (1968, 1974, in press), and most recently Cockrell's at 8So19, methods, techniques and equipment have been developed which allow the same precision of data recovery from these underwater sites as would be expected on land sites (Cockrell 1972-1976; Cockrell and Murphy 1978a; Murphy 1978). This developing site location model has attracted attention to potential offshore sites (Cockrell 1975). Florida's Underwater Archaeological Research Section is now involved in the administration of a contract program which allows commercial salvors to salvage historic period shipwrecks in Florida waters. Our site location model has been applied to offshore work and we are closely monitoring excavations for evidence of early sites as well as for the ongoing collection of historic shipwreck data. The 1976 and 1977 field seasons have produced encouraging results, as one east coast site has produced Pleistocene horse material from a gray-green marl sediment in 7 m of water. Mastodon remains have also been reported in 13 m of water near Jacksonville, on the Atlantic upper East Coast of Florida.

One most notable site is 8Sl17, a 1715 Plate Fleet shipwreck off the Ft. Pierce coast. This well known wreck, often referred to as the "Gold Wreck", has been reported on by Carl Clausen (1965) and by Robert Burgess and Clausen (1977). The site has been worked since the mid-60's and, due to the nature of Florida's contract program at that early date and the relatively primitive techniques employed, there was little control over the recovery techniques employed and the data have proven to be largely undependable. We have substantially changed the program and now exercise more vigorous controls, and are in the process of reconstructing, as nearly as possible, the early shipwreck data and incorporating them into a current research design. Unfortunately we can re-examine only some 25% of the material, that portion traditionally retained by the State, as the rest was given to the salvor as payment.

There has also been developed a mapping system which has been instituted on this and all other shipwreck sites being currently worked. The beach is first surveyed and a base map drawn up, with datum points, large artifacts, and all features being triangulated in from shore-based

transits. Inwater positioning from the boat is accomplished by taking two angles from three visible shore positions with either an Ilon position finder or a horizontally held sextant. Inwater tape measurements are also taken, from sub-datum points on the seabed. Each artifact is serially tagged upon recovery and entered on the site map, with an artifact record form being filled out on-site for each artifact. For purposes of conceptual manipulation, the artifacts are presently divided into eight provisional categories, given UTM coordinates, and entered on clear acetate overlays on the base map according to these provisional categories. (e.g., ceramic containers, non-ceramic containers, etc.) All positions are based on the UTM coordinate system and the base map is tied into Florida Department of Natural Resources coastal setback monuments. This enables us to rapidly collate intersite and intrasite data for later analysis. We are currently working on the development of a computer program which will incorporate site provenience, laboratory analysis data, field data, and artifact category, for the integration and manipulation of this large amount of data.

Through our attempts at reconstructing the data on shipwreck material brought up in the 1960's and early 1970's, and re-examination of the collection, we discovered that reports of elephant bones and ivory, then stated as perhaps indicative of a slave ship, were stemming from the discovery of mammoth remains at 8Sl17. We found also that a human cranium, mineralized and of darkish color, had been recovered, as well as a projectile point, both of which unfortunately cannot now be relocated. We have recovered in the last 2 years from this site bone pins, fossil horse, camel, and mammoth. The proboscidian is yet *in situ* and work is planned for summer 1978. There is, as evidenced by this material, and the stratigraphic profiles, an intact Pleistocene strata beneath this shipwreck (Cockrell and Murphy 1978a, 1978b).

Present Work

Daily checking of the beach inshore of this site area was begun this past season, particularly during periods of bad weather when rapid erosion takes place, as shipwreck materials are often uncovered near the surfline. It was noted during this checking that a peat outcrop was exposed which appeared very different than the fairly late peat often visible on this beach apparently from an 1890-1920 deposit. The earlier peat layer has tree stumps in it, as well as surface collected Pleistocene material (horse and turtle) on the beach in immediate proximity. About 40cm below this earlier peat a gray-green clay was encountered. The same stratigraphic sequence occurs offshore. Samples of this beach material were collected for C-14 dating, palynological, and petrographic analysis; the results are not as yet available. Our speculation is that, in light of the other evidence presented, it will probably date to the terminal Pleistocene, ca. 10,000 B.P. It was surprising that even though this is a moderate to high energy coastline, with strong lateral current and littoral drift, we still have intact peat and marl deposits. Apparently this exposure of the older peat is infrequent and short term, as the next day it may completely be covered by re-deposited beach sand.

It thus seems that evidence suggests that a coastal site does not always require a humic covering shield to survive immersion by relative sea level rise, as the beach sand itself may provide a protective mantle, or buffer, after some initial scouring. This offers promising prospects for others who might be edgaged in similar search. We feel that this is a potentially very productive site and plan to continue work on it in the upcoming field season.

Conclusion

The importance of this study is that underwater sites do exist, and that there now exists a model for early site location, both on and offshore from the Florida Peninsula. We have much to learn; these are but preliminary investigative stages. However, as our knowledge grows and our understanding of the behavior and lifeways of these early people expand, we should be able to refine the model and facilitate the location of offshore sites by going to the appropriate depth and searching. A productive test of this incipient hypothesis would be to start with the 6000 to 7000 BP sites, at the early Archaic horizon, as it appears from our current research that there was a rapid population expansion then, with large sites occurring; additionally, there is a general consensus on the sea level stand at this later period among geologists, as opposed to wide vari-

ation for terminal Pleistocene stands. We have begun examination, at the appropriate sea level contour, for these sites, and once they are located, we will test and develop methods for remote signatures. We suspect that we are going to find a band of Archaic sites between 10 and 20 m water depth, with earlier sites deeper, around Florida's coastline. We will be reporting further on this work in the near future.

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