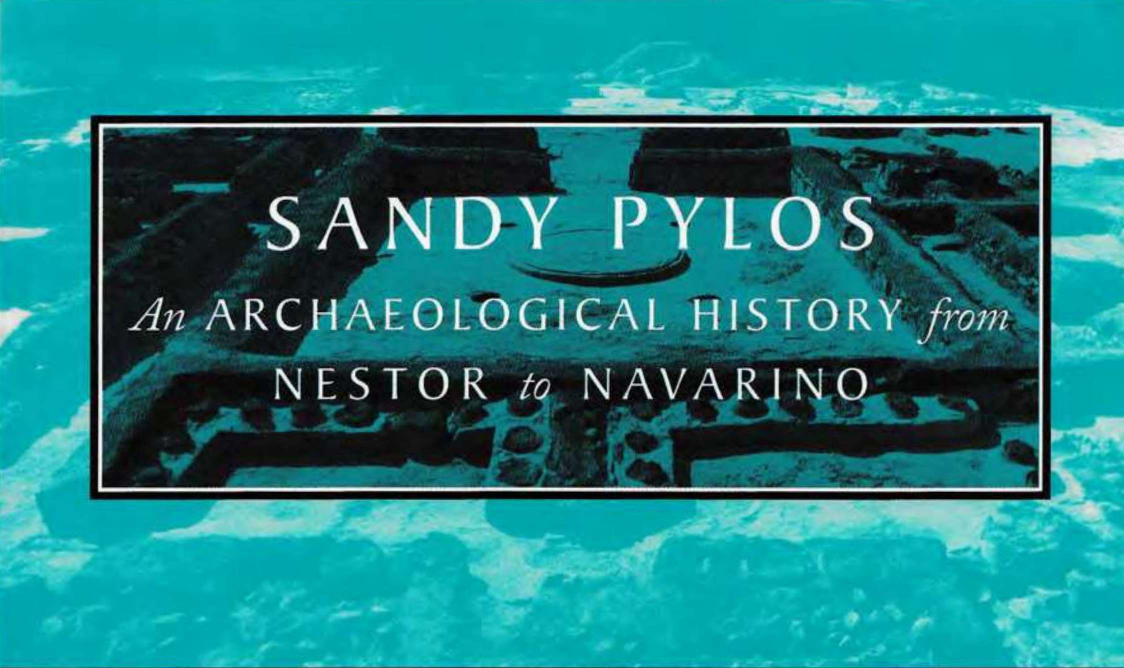

SANDY PYLOS

An ARCHAEOLOGICAL HISTORY *from* NESTOR *to* NAVARINO

EDITED BY JACK L. DAVIS

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FOCUS

The PHYSICAL SCIENTIST'S ROLE *in* REGIONAL ARCHAEOLOGY

Reconstructing the history of the Pylos region—or of any other landscape—means determining a sequence of events, like the scenes in a motion picture, showing when and for what reason landscape changes occurred. In environmental reconstructions—much as in screenplays—important moments are emphasized and presented in detail, whereas periods when little or nothing happened are simply omitted. The organization of the physical scientific work on an archaeological field project is also somewhat similar to that needed to shoot a film. In both instances, a team effort, involving experts from many different fields, is required. While some people are dedicated to solving special problems, others concentrate on the ultimate results of the combined efforts.

The movie director, however, has a script that contains the story, scene by scene, leading up to the film's climax, whereas the director of the physical scientific work on an archaeological project only has the last scene of events from which his teams will have to work backward, collecting clues during fieldwork to determine which processes were responsible for environmental changes. This last scene is simply the present landscape—the product of a long evolution, yet a momentary frame in the eternal evolution of the earth. To decide which methods are needed to reconstruct the landscape and who might be the right people to employ these methods, it is important to start with a careful interpretation of the present landscape. Hence, conducting a reconnaissance is as indispensable for an environmental reconstruction as reading the script is for the production of a movie.

In 1991, during a first visit to our study area, we established four main areas in which intensive physical scientific work was required. First, the modern floodplains had to be investigated to determine how much sediment had accumulated in recent times and how deeply some archaeological sites might have been buried under the surface. Second, at places

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where architectural structures were likely to be hidden under the surface, we wanted to conduct a geophysical reconnaissance to trace these constructions without excavation. Third, the vegetation history of the past several thousand years had to be determined to find out about the extent and character of ancient land use. Finally, the soils had to be studied to establish their state of preservation and the past and present agricultural potential of the landscape.

We invited a total of twenty-seven scientists and graduate students for the physical scientific fieldwork on PRAP, and many more experts conducted laboratory analysis on material collected in the field. The idea was to stimulate new ideas for landscape reconstruction in Greece by bringing in scientists who had worked outside the Aegean. Specialists came from many disciplines, including geoarchaeology, geomorphology, geophysics, geochemistry, soil science, palynology, geochronology, micropalaeontology, and hydroengineering. They came from eight different universities and research institutes in the United States, Greece, Germany, Canada, Russia, and Switzerland.

In contrast to many other archaeological projects in the Aegean, the ultimate goal of the physical scientific work on PRAP was not to produce individual contributions from the experts involved, which—again using the comparison with movie production—often appear like disconnected takes and scenes that bear little or no relation to each other. Instead, we were aiming for a complete integration of the many disciplines involved, which would lead to a comprehensive story of the evolution of the landscape, not as a substitute for, but as a complement to, highly specialized articles in scientific journals.

The first expert to join our team was Sergei Yazvenko from the Department of Higher Plants at Lomonosov University in Moscow. Yazvenko had written a dissertation about the Holocene vegetational history of the Black Sea's coastal region and received a grant shortly after the commencement of PRAP that permitted him to move to Canada, where he now lives. Yazvenko's botanical research for PRAP led to one of the most detailed, complete, and accurately dated vegetation histories of southern Greece. The methods he employed are the subject of a separate focus in this chapter.

To locate buried architectural structures, we invited a group of geophysicists from the Polytechnical University of Braunschweig in Germany. Guided by Falko Kuhnke, this team had already mapped an entire Roman settlement in southern France without moving any soil. Geophysical mapping rests on measuring minute variations in the earth's magnetic field, which are often caused by accumulations in the soil of natural building ma-

FIGURE 15
Geophysicists measuring subsurface anomalies at the Palace of Nestor. PRAP Archive.

terials such as stones or mudbrick. A second, equally useful technique measures the electric resistivity of the soil between two probes. Many thousand such measurements, at 1-meter intervals, produce a map that provides important clues about the size and extent of subsurface structures. These geophysicists systematically investigated a substantial area adjacent to the Palace of Nestor (Fig. 15), as well as three other sites (Bouka, Dialiskari, and Ordines; see Chapter 5 for the palace area, Chapter 7 for the other sites).

The next expert to join our team was Michael Timpson, from Northern Arizona University. For several years Timpson had worked as a soil scientist on American archaeological projects in eastern Crete. His role on the Pylos project was to determine how much of the prehistoric surface has been preserved until the present day and how much has been destroyed by erosion. Soils form in the uppermost epidermis of the earth through the movement of water, ions, and clay combined with the activities of plants and microfauna. The maturity of a soil mainly depends on the climate, the duration of exposure at the surface, and the type of vegetation that covers it. In Greece, at least one to two thousand years of landscape stability are necessary to generate a distinct soil with several different horizons. Timpson found that because of high rates of erosion, such undisturbed soils are extremely rare in the center of the study region. He was also able to distinguish between areas that now contain few archaeological sites due to soil erosion and areas that were never densely inhabited.

During the final season, we invited a few well-known authorities to examine specific problems that had arisen in the course of fieldwork. Jost Knauss, from the Polytechnical University in Munich, a specialist in Late Bronze Age water management, investigated the hydrological parameters of a basin near the town of Romanou, west of Pylos, and arrived at the conclusion that it was probably, at least in part, not natural (see Chapter 3). He also examined the Selas stream, which changed its bed not too long ago and now passes through the artificial basin. Günther Wagner, from the Max Planck Institute of Nuclear Physics in Heidelberg, and his colleague Yiannis Bassiakos, from the Demokritos Institute in Athens, were asked to help us date the first two Palaeolithic sites in Messenia—both of which were discovered by PRAP. Using a technique called thermoluminescence dating, they were able to determine when the sediments surrounding the stone tools were last exposed to sunlight, which in turn has provided a date for the deposition of both sediment and tools.

During the final season of the project in 1995, the physical scientists present in the field at times outnumbered the archaeologists—perhaps hinting at the increased significance of the role of physical sciences in archaeological research in Greece.