

# Preface

The 1990s will probably be remembered in the history of archaeology as the age of GIS. At that time, the introduction of digital technology in archaeological research was in its infancy. Software and hardware had only a limited capacity to integrate the range and complexity of information involved in the archaeological process. In the following decade, however, the archaeological community became gradually aware of the need for a consistency of approach across the whole framework of archaeology, while rapid advances in software and hardware made it possible to envisage a significant renewal of the whole or large parts of the archaeological process. This was the age of the Digital Revolution.

At the same time, remote sensing gained an increasing relevance and application within archaeology and throughout the scientific community. Up to this stage, the definition of remote sensing had focused on the analysis of data collected by sensors that were not in physical contact with the objects under investigation, using cameras, scanners, radar systems, etc., operating from spaceborne or airborne platforms. Now, a wider characterization began to take hold, treating remote sensing as *any* nondestructive approach to viewing the buried and nominally invisible evidence of past activity. Spaceborne and airborne sensors (now supplemented by laser scanning) became joined by ground-based geophysical instruments and undersea remote sensing, as well as—for *some* archaeologists at least—by other noninvasive techniques such as surface collection or field-walking survey. Within this broader interpretation, *any* method that enables observation of the evidence on or beneath the surface of the earth, without impacting on the surviving stratigraphy, can legitimately be included within the ambit of remote sensing. This and other impulses have also resulted in a rapid growth in multidisciplinary working within and around archaeology and related cultural studies.

From the methodological point of view, the most important change over the past few years has been the burgeoning capacity of archaeologists and cultural historians to collect—relatively easily and quickly—massive 3D datasets at the landscape, local, site, and object scale. Initially, archaeologists did not know exactly how to manage this vast array of 3D information. They readily grasped the idea of its huge potential but did not see how to exploit it. The all-pervading presence of the third

dimension prompted the need for new perceptions of archaeological features and processes at an intellectual level, in terms of “3D thinking”—or better 4D thinking considered that as archaeologists, we cannot avoid dealing with the chronological dimension—and at a procedural level, challenging long-established approaches to archaeological documentation and therefore to the interpretation process as a whole.

Now, in the early years of the present decade, we feel that we are ready—or at least *nearly* ready—to embrace these new methods of recording, interpreting, conceptualizing, and communicating archaeological data and relationships across the passage of time. Technological, cultural, and epistemological advances are enticing us to encompass new and completely different perspectives based on immersive, interactive 3D and 4D environments for managing archaeological data at both the scientific and interpretative levels.

Everybody, in the next few years, will have the opportunity to blend the physical world with a sensory-rich “virtual” world where archaeologists can naturally and intuitively manipulate, navigate, and remotely share interpretations and case studies. Our understanding of archaeology will be taken to a new level, enhancing our capacity to develop interpretations and to present them to fellow specialists and to the general public as simulated scenarios in 4D. Rapid developments in ICT, including hardware and software for immersive environments, will even allow us to communicate and interact with one another through further cultural experiences such as sound, smell, and tactile interfaces. The transformation of the traditional remote sensing in “something else” defines new borders for this research field and suggests a new methodological approach. “Polysensing” rather than “remote sensing” can better define this revolutionary approach. It is quite interesting to notice that archaeology plays as primary actor in this revolution because of its multidisciplinary character and mission.

Welcome in the Age of Sensing!

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