

The neutron techniques

The human presence in Greece is being detected since the distant Paleolithic period and continues, almost uninterrupted, until today. In all these millennia, the different races, peoples, etc., which either settled, or conquered, or crossed the borders of modern Greek territory, created their own culture, with its special characteristics and left there their indelible traces, some of which are still visible today, others are still waiting for the archeological research and others have already been discovered and either adorn in the numerous Greek museums, or are in the process of study, evaluation and preservation.

The enumeration of the various inhabitants of the Greek peninsula can be characterized as exhaustive, starting with the Paleolithic people and ending with the modern Greeks. Respectively, their traces of residential remains, religious buildings, weapons, tools, jewelry, everyday objects, artifacts, etc., are uncountable, with a huge variety of shapes, colors, materials, uses and dates.

The systematic archaeological research, of course, using the historical knowledge of each place, the written sources, the global bibliography, previous researches and stratigraphy, succeeds, with great success, in identifying and dating the findings of excavations and archaeological researches in general. And it is true that in the last decades, archaeological research has performed miracles in Greece, despite the various difficult conditions, with continuous excavations, restoration and publication of monuments, construction of new modern museums, where exhibits have been placed according to museological studies and visitors can navigate using the latest technology that helps them to understand, in the best possible way, the history of each place.

Of course, new technologies have now penetrated into every science, as well as into our daily lives, changing everything radically. After all, there is a two-way relationship between technology and science, as science seeks to evolve technology and technology to promote and facilitate the work of science. Especially in the case of archeology, over time, there was a need for cooperation with different sciences and specialties in order to study monuments and finds, such as photographers, engineers, architects, conservators, historians, philologists, numismatists, epigraphers, etc. Modern archaeology now relies a lot on technology. Contemporary archaeologists use chemical analysis, radiocarbon dating, laser scanning etc. to evaluate artifacts without damaging them. In addition, technology has permitted archaeologists to use advanced excavation techniques, enabling safer recovery of fragile artifacts or exploration of sites without disturbing the soil and objects underneath. In conclusion, using advanced techniques, archaeologists have been able to explore deeper into the past than ever before.

Of course, in archeology, as in all sciences, problems and questions increase as research intensifies e.g. we often have undecorated vessels or objects from disturbed stratigraphy or findings from previous unscientific and systematic excavations in museum warehouses, without much accompanying evidence, two difficult cases regarding their origin and dating. Also, masonry, without findings, with coarse stonework, or fortifications with many repairs raise dating problems. The same category includes murals and ecclesiastical objects, which are dated approximately and based on style. In addition, in monument restorations, architects often need information about the mortar and its materials. And finally, in cases where an object looks imported or a building has a very different construction technique from the local or modern, it is necessary to trace the origin of the materials.

To all of the above and even more questions can be given specific, specialized and detailed answers from a new technique, which promotes archaeological research faster and more completely. It is the use of neutrons in order to date and analyze the composition of various objects of different materials. This technique, already known in the industry and in various other fields, does not affect the subject. On the contrary, it offers very detailed information, which can be used in various ways, regarding the dating, origin, composition and construction of the object, leading to valuable conclusions and significantly enriching the research.

The aforementioned technique was presented, in detail, by Dr. Massimo Rogante, who applies it, on May 31, 2021 in the online lecture entitled «"Advanced characterization by neutron techniques in the field of Culture Heritage", organized by the Hellenic Institute of Cultural Diplomacy, based in Ancona, Italy in collaboration with the University of Ioannina and the Office of Mechanical Studies Rogante.

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