

A cesium magnetometer was largely instrumental in finding the lost Greek city of Sybaris, buried for about 2500 years on the southern coast of what is now Italy. Sybaris, referred to many times in classical writings, was the richest and most decadent city of early Greece. First it was destroyed by war, and then, in the course of an earthquake, this ancient fun city, built literally as well as spiritually on sand, either slid into the sea or was inundated by coastal waters. Because most of the remains lie under the water level, recovery is very difficult, but the fact that the ancient city was detected under the waterline is an added technical accomplishment for this sensitive device. Use of an exploratory instrument such as this to locate ancient ruins should eliminate much of the unproductive digging that was carried out in the past. I understand that a similar instrument has been used to try to locate Camelot, the palace of King Arthur some 1400 to 1500 years ago. The search in South Sudbury, England, has not yet unearthed this legendary site.

Radioisotope X-ray fluorescence analysis

Radioisotope X-ray fluorescence analysis is being developed for a variety of industrial applications but also can be used with benefit by the archaeologist and art investigator. This technique detects the presence and measures the amount of a number of chemical elements in a specimen. It is based on the absorption of X-ray or gamma-ray photons by particular elements, followed by emission of X rays whose energies are characteristic of the elements present. Either an X-ray machine or radioisotopes can be used to generate the incident photons. Radioisotopes, however, offer the opportunity for use of portable equipment.

X-ray fluorescence has been used to analyze and identify the glazes of old ceramics and was used some years ago on the skull and jawbone of the Piltdown Man. You may recall that it contributed the final bits of information that established Piltdown as a complete fraud. This method provided proof that the brown coloration of the skull was not a result of prolonged staining by iron in the water, as originally claimed, but was the result of artificial treatment of the bones with chromic acid.

Neutron activation analysis

Another nuclear technique which has broad application in the humanities and related areas is neutron activation analysis. An im-