Most archeologists agree that the study of pottery and other ceramic objects is the most fruitful method of tracing trade routes and movements of ancient peoples. We talked briefly about pottery in connection with thermoluminescence; let me extend those remarks somewhat in connection with neutron activation analysis.

Ceramics were the major cooking utensils and containers for storage and and shipping in early civilizations. They were also a major and universal medium for artistic expression and for fashioning cult objects for religious and burial practices. It is no exaggeration to state that much of what is known about prehistory comes from the detailed study of evolutions of pottery styles unique to particular cultures. Seemingly, wherever people went, their pottery went with them so the tracing of dispersion of pottery styles has become the means for tracing migrations, conquests, trade, and other cultural contacts.

In the past archeologists have relied largely on physical characteristics to identify pottery and to deduce its place of origin. Now scientists have analyzed by neutron activation pottery fragments of the same physical appearance and have found in some cases that they have different chemical composition and therefore were produced from different clay sources. Tiny amounts of elements such as cesium, lanthanum, and cobalt can be sorted out to give pottery material its own peculiar chemical fingerprint. For example, if a potsherd found in Yucatan matched the chemical profile of pottery originating in Cuzco, Peru, it would give a more-detailed picture of ancient trade patterns than can be obtained from pottery markings and shapes. Pottery styles were not always unique to a particular location.

Professor Isadore Perlman and his staff at Lawrence Radiation Laboratory have worked out a system of analysis in which about 35 elements can be measured in neutron-irradiated pottery, most of them with very high accuarcy. Extremely sensitive radiation detection equipment is used to analyze the hundreds of gamma rays that appear when pottery is irradiated. Laboratory researchers are now engaged in the exacting task of establishing local pottery group profiles for a number of sites of archeological importance and from these of proving the origins of pottery no matter where it is excavated. One can visualize from this work a growing atlas of chemical pottery profiles that will serve as a handbook for anyone in the world applying similar methods to archeological problems.