

The same systematic, analytic approach is being made in the neutron activation analysis of old paintings. The AEC is now in the midst of a three-year project with the National Gallery of Art which is being carried out by the Carnegie-Mellon University in Pittsburgh. This joint research effort is primarily concerned with analysis of various paints and materials used by particular artists or schools of artists and is aimed at resolving problems in art identification and authentication. Through neutron irradiation of paint specks from Van Gogh masterpieces, for example, it should be possible to compile a chemical profile or fingerprint of pigments that he used in his work and thereby establish a basis for authenticating or invalidating paintings represented as Van Goghs.

This research effort has become a little more complicated than originally anticipated because the early artist had a tendency to use various mixtures of whatever materials were available to achieve the color and texture he desired. Consequently, the chemical composition of certain paint materials used by the Renaissance artist is sometimes unusual enough to affect the credibility of a pigment analysis.

Neutron activation analysis is nevertheless a valuable nondestructive tool for the art investigator and is an effective method for exposing art forgeries. Since World War II there has been a growing trade in fake masterpieces, particularly of the French Impressionists. One critic has estimated that "Corot painted over 2000 pictures, and, of these, more than 5000 are in the United States."

Actually it has been quite difficult to pass off art work produced in the last 20 years as the genuine product of earlier artists. The increased amount of carbon-14 in the environment as a result of atmospheric nuclear tests has resulted in a higher concentration in linseed oil, which is produced from flax, or even in the paper or canvas on which the picture is painted. This increase in man-made radioactivity is large enough to be detected in relatively small samples taken from recent paintings and contrasts sharply with the minimal carbon-14 content in earlier paintings.

Activation analysis in crime detection

Since we are already discussing neutron activation analysis in the context of detecting art forgeries, let me branch out of the humanities