

Today's Presentation

Program: Ancient Pigment Solves Modern Crime

Speaker: Dr. Gregory D. Smith, Otto N. Frenzel III Senior Conservation Scientist, IMA **Attendance:** 108

Guests: Jim Stohler, David Zauner, Jay Franco, David Roy, Howard Harris, Katie Patterson, Kathleen Rice

Introduced by: Bonnie Carter

Scribe: Jerry Kurlander

Editor: Bill Elliott

Dr. Smith showed images of the very extensive science lab at the IMA. Much information about paintings can be learned by studying both the fronts and backs. Many techniques can be used, including x-ray and infrared analysis. The chemistry of colors used in the art objects can also be utilized in determining many features of the objects, including age and authentication. The colors used have evolved over time from the Egyptian Blue probably 5250 years old to the recent development of the profound black of Vantablack.

The conservation scientist uses all of these techniques and more of those seen on television in the forensic scientist programs. Dr. Smith is involved in an IUPUI graduate seminar where they do a scientific analysis of fakes, forgeries and misattributions.

The current study is of Egyptian Blue which was probably used about 3250 B.C.E. This substance, $\text{CaCuSi}_4\text{O}_{10}$ was compounded from malachite, natron, chalk and sand at 925 degrees centigrade for 10 hours. The creation of this color was quite remarkable for that time. It can be identified with luminescent photography. The particle size of this color under the microscope could be differentiated from lapis lazuli which was commonly used in fakes.

"It is impossible for a criminal to act especially considering the intensity of a crime without leaving traces of his presence." Edmund Locard (1877-1966) Latent fingerprints are the most common type of finger mark. There are challenging surfaces for detection of finger marks such as paper currency and soda cans. In dusting for prints, particle size is very important. Even the type of brush used for the dusting is important. Natural hair fibers must be used. The age of the fingerprint is also very important, though fingerprints have been lifted from paper after many decades under certain circumstances.

Egyptian Blue has many advantages as a dusting powder, including higher contrast and low cost among others.

Dr. Smith's work, at least in part, will be included in the May issue of National Geographic. He had many co-workers in this project, including some from Curtin University in Perth, Australia.



Dr. Gregory D. Smith