

INFECTIOUS DISEASES

Medieval cure-all may actually have spread disease

One of medieval Europe's most popular concoctions for treating disease might instead have been an agent of germ transmission, new research suggests.

In the Middle Ages, merchants in apothecaries often dispensed mumia, or bitumen, a black, asphaltlike substance thought at the time to alleviate ailments as diverse as epilepsy, gout, and plague. When natural supplies of the oozing tar ran short, merchants turned to Egyptian mummies as a source of the material, says Barb'ra-Anne Carter of the California State University in Los Angeles. That's because the practitioners mistakenly believed that bitumen had been used to create the dark-skinned mummies, whose name derives from mumia, she notes.

When import restrictions interrupted the supply of Egyptian mummies, the European merchants—loath to give up a profitable product—turned to readily available local imitations. Slowly dried in ovens, these European “mummies” were made from any corpse that unscrupulous suppliers could get their hands on, says Carter. The remains of criminals, the poor, and the sick were favorite raw materials because they could be obtained more easily than other bodies could.

Apothecaries dispensed the freshly made mummies in several forms, including ground, powdered, and diced preparations. In some cases, they boiled the desiccated flesh and skimmed off the oils and resins that had floated to the top of the water. They sold this material in small flasks.

Carter speculates that people who consumed or applied European-produced mumia were being exposed to disease agents. Parasites can survive within recently dried fish, she notes, so human parasites could probably have remained viable within the European mumia.

Circumstantial evidence also suggests that some bacteria—including *Yersinia pestis*, the microbe that causes plague—might have found refuge in the mummies, she adds. Between 1720 and 1722, France experienced several outbreaks of plague, the largest of which occurred in Marseilles, a major mummy-making center.

Most researchers attribute the spread of plague among people to bites from rat fleas infected with *Y. pestis* because that's how the disease is usually transmitted today, says Carter. However, rat fleas are dormant in winter months, but the French outbreaks—

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as well as many European plagues of previous centuries—occurred in all seasons. Furthermore, there's scant documentary or archaeological evidence for inordinate infestations of rats during those outbreaks.

Maybe, Carter suggests, many European plague outbreaks were, in fact, a curse of the mummy. —S.P.

ARCHAEOLOGY

Laser scanners map rock art

Researchers have developed a way to use laser-based surveying instruments to create detailed images of ancient etchings on stone. The new technique, which provides far more information than photographs do, could enable archaeologists to quickly catalog the ancient rock art, or petroglyphs, at sites that are geologically unstable or vulnerable to theft or vandalism.

The prototype equipment uses a green laser beam that scans back and forth to generate three-dimensional maps of objects and terrain, says Thad Wasklewicz of the University of Memphis in Tennessee. Those maps, which can be compiled in just a few minutes, span a 40° field of view and contain up to 1 million data points—each of which is accurate to within 6 millimeters.

Ancient artists created petroglyphs by scraping away a dark, mineral-rich coating called desert varnish (*SN*: 1/3/04, p. 14) to expose underlying light-colored material. The intensity of laser light that reflects off the varnish is different from that which bounces back from exposed rock. After field data have been collected, analysts can digitally assign a different shade of color to each intensity level of reflected light and thereby create high-resolution, false-color images of the art.

Wasklewicz and his colleagues field-tested their technique at a site near Little Lake, Calif., where some petroglyphs date back as long as 14,000 years ago. With their equipment, the researchers generated large-scale maps of the ancient lava flows, as well as detailed images of art on individual rocks. In some cases, the laser scans picked up the faint

traces of ancient petroglyphs that couldn't be seen with the naked eye because they were obscured by a fresh coat of desert varnish, says Wasklewicz. —S.P.

SCIENCE AND SOCIETY

Night space images show development

For many emergency-management officials, monitoring the rapid pace of development in fire-prone regions of the western United States is a daunting task. Now, scientists may have come up with a means to estimate population growth in these areas by using satellite images taken at night.

To assess the fire risk to people in a region, analysts need to determine where houses are being built and how close they are to each other. However, by the time enough data are compiled by current methods, the information is often already outdated, says Thomas J. Cova, a geographer at the University of Utah in Salt Lake City. For example, census data in most sparsely populated areas of the United States are updated only once every 10 years. Acquiring and assembling data for broad regions can be difficult if not impossible, says Cova.

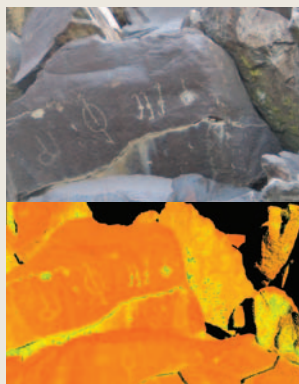
To circumvent these troubles, emergency-response officials have sometimes resorted to high-resolution daytime satellite images. But these are expensive, and analyzing them to spot houses in thickly

forested areas is tedious. Cova and his colleagues suggest that analysts can more easily spot areas with booming populations by compiling and analyzing nighttime images taken by Defense Department satellites. They carry instruments sensitive enough to detect the illumination from a single floodlight outside a home at night.

By comparing such composite images of Colorado snapped in 2000 with images gathered in 1992, the team estimated the rates of development in many areas. In Teller

County, the acreage developed jumped by the most, 7.3 percent.

Such data are next combined with maps that depict a region's fire hazard, assigned on the basis of factors such as terrain and types of vegetation. Analysts can then estimate the fire risk to specific locales. —S.P.



ANCIENT SCRAPES

Petroglyphs at a site near Little Lake, Calif., as seen in visible light (top) and in a false-color, laser-scanned image (bottom).