

Piecing together the siege of Sardis

Two ancient Greek cups are providing important clues about the fall of the kingdom of Lydia, which was established near the Greek empire in the seventh century B.C., in what is now Turkey. The cups, says Nancy Hirschland Ramage of Ithaca (N.Y.) College, were found broken and partly burned on the floor of a building undergoing excavation at Sardis, once Lydia's capital. They date to shortly before the middle of the sixth century B.C. and confirm suspicions that a colossal defensive wall behind the building was partially destroyed by Cyrus the Great of Persia in late 547 B.C. or early 546 B.C.

The destruction was caused by a battle in which the Persians, according to historical records, conquered Lydia while it was at the height of its power. At the time, says Ramage, Croesus was the Lydian king. Sardis later became a large Hellenistic and Roman city.

Over the last decade, the 60-foot-thick "city wall" has been studied by scientists associated with an ongoing expedition at Sardis sponsored by Harvard University, Cornell University, The Corning Museum of Glass and The American Schools of Oriental Research. In 1984, the floor of another structure was found buried beneath bricks that had fallen from the wall. A number of items lay scattered across the floor, including cooking pots, kitchen utensils, cups, lamps, glass beads, parts of a loom and foods such as barley and wheat heaped in storage vessels. Most of the pottery was Lydian, but the two cups in question were of Greek origin and could be compared to similar vessels that have been confidently dated.

One cup (seen below) was pieced together from 49 fragments and contains images of two panthers standing next to palmette plants. The reverse side, although missing some pieces, bears the same scene. The other cup was completely restored from 54 fragments. On each of its sides are two dancers placed between palmettes and tendrils. When compared to similar Greek cups, the shape and decorative style of the Sardis vessels dates to shortly before 550 B.C., reports Ramage in the October *AMERICAN JOURNAL OF ARCHAEOLOGY*. The two cups appear to have been imported to the site just before the Persian conquest.



Ramage

"The beauty of these cups is that they confirm the chronology for the destruction of this area," says Ramage. Some investigators have doubted whether the mud-brick wall was a defensive fortification. But the new evidence, she notes, argues against their misgivings. The cups also provide a valuable landmark for dating Lydian pottery that was found in the same structure.

The fact that many of the cup fragments were burned, says Ramage, indicates that a fire raged through the building. Bricks from the city wall then fell on the structure, burying and sealing the floor. Since food storage and preparation and other household activities were carried out there, Ramage suggests that the occupants must have fled, "abandoning food, loom, cooking pots and even fine imported pottery as fire and then falling bricks destroyed this place."

AIDS virus protein coat lethal

The more scientists learn about the AIDS virus, the more diabolical the particle appears. A nongenetic component of the AIDS-producing human immunodeficiency virus (HIV) is sufficient to kill cells *in vitro*, several recent studies show. The new finding complicates the vaccine picture because the protein, if included in a vaccine, could harm the recipient's immune system.

Robert F. Garry of Tulane University in New Orleans, along with colleagues from Tulane University and the University of Southern California in Los Angeles, exposed HIV to ultraviolet radiation, a process that prevents the virus from reproducing itself or directing the production of new proteins. The irradiated virus killed cells in culture at the same rate nonirradiated HIV killed cells, they report in the October *VIROLOGY*. The finding supports work from other laboratories indicating that the protein itself, even without genetic expression or viral reproduction, is lethal.

Harvard University researchers have shown that high levels of the protein, which coats the virus, prompted a laboratory cell line to fuse together and die. Several other laboratories, including Robert Gallo's at the National Cancer Institute, showed that HIV with a mutant envelope gene can replicate itself but not kill other cells (SN: 8/16/86, p.104). In addition, Gallo's lab and several other institutions reported in the Oct. 23 *NATURE* that vaccinia virus saddled with the envelope gene caused white blood cells to fuse and die.

Many vaccines are made of whole viruses that have been inactivated or killed, but the evident lethality of the HIV envelope protein indicates that such an approach could be toxic. "It means that if one is to make a vaccine, you have to inactivate the function of the envelope protein that kills the cells," says Garry.

But while the findings close one door, they may well open another, says Garry. Modification of the envelope protein may be possible. The findings also suggest that the search for a cure should focus on compounds that will interact with the virus particle quickly, before the envelope protein encounters the cell surface and the virus slips in. "Anytime you learn something about a pathogen, you're learning about your enemy," says Garry.

Another role for TNF/cachectin

Tumor necrosis factor (TNF) is becoming a do-everything substance. First Rockefeller University researchers in New York City realized that cachectin, the weight-loss-producing substance they had been working on for years, was essentially the same as tumor necrosis factor, a substance that researchers had isolated using its ability to kill cancer cells (SN: 8/31/85, p.132). Now a study described in the Oct. 30 *NATURE* indicates that cachectin can directly kill several kinds of viruses, independently of its ability to induce production of antiviral interferons in the body.

The report comes from several German institutions and Genentech, Inc., in South San Francisco, which is interested in the commercial potential of TNF. Whether it will be an anti-cancer drug, a weight-loss product or a cure for the common cold remains to be seen.

Vaccine compensation passes

President Reagan signed into law last week an omnibus health legislation plan that, among other provisions, includes a no-fault compensation plan for injuries or death related to vaccines required for school attendance. The legislation does not provide a source of funds for compensation; the House of Representatives is expected to consider a tax on vaccine manufacturers when Congress convenes next year.