RANDOM SAMPLES

edited by CONSTANCE HOLDEN

Plague in India Confirmed

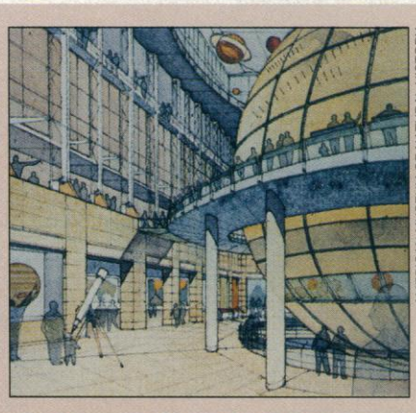
Six months after the epidemic that hit Surat, India's diamond capital, a government committee has established that the disease was, indeed, pneumonic plague. By culturing the bacterium from blood and sputum samples and analyzing its DNA, scientists have identified the bacterium *Yersinia pestis*, the same agent that caused the bubonic plague that devastated Europe in the 14th century.

The announcement is expected to lay to rest speculation among scientists that the disease, which claimed more than 60 lives and led to financial losses estimated at $600 million, was not really plague. In reports published in *Nature* and *The Lancet*, scientists had pointed out that although bacteria resembling *Y. pestis* had been isolated from victims, they had not been definitively identified. Skeptics also asserted that the epidemic had nonplaguelike features. One team suggested the disease might really be melioidosis, whose bacterium, *Pseudomonas pseudomallei*, looks like *Y. pestis*.

The report, released by the Technical Advisory Committee that the government set up after the epidemic, explains that millions downed massive amounts of antibiotics to keep the killer at bay, so mortality, at 1%, was exceedingly low. Kamal Krishna Datta, chief of the National Institute of Communicable Diseases, adds that the drugs initially made it difficult to collect enough bacteria from blood and sputum samples to culture.

While the committee was able to nail down the Surat scourge, it was unable to confirm a small outbreak of what is believed to have been bubonic plague that preceded the pneumonic outbreak because there were no culture samples available from patients. Nor can the committee track down the original source of the infection, says Datta, because so little data is available on the Surat region. "India's disease surveillance system is like what it was in the 1960s," he says. He and other officials hope that the report will be a first step toward improving it.

Health officials say that in the past, pneumonic plague was preceded by bubonic. Because that does not appear to have been the case this time (the bubonic outbreak was more than 100 miles from Surat), some experts want to look for DNA samples from 14th-century plague victims to see if the bacteria match up.



AMERICAN MUSEUM OF NATURAL HISTORY

Planetarium gets facelift. New York's American Museum of Natural History is planning to greet the next century with a big bang. Its 60-year-old Hayden Planetarium will be expanded and packed with the latest technology to enact astronomical events. And a new Hall of Planet Earth is being designed to show how the history of the universe is related to the evolution of the planet. No other planetarium "has undertaken an initiative of this size," says museum spokesperson Elizabeth Chapman. Hayden's 80-foot dome will be turned into a completed sphere housed in a glass enclosure (see above). Inside will be treats ranging from simulated stellar explosions to live linkups with the National Aeronautics and Space Administration. The project, approved by the Board of Trustees in December, is estimated to cost up to $90 million and is to be ready by the end of the millennium.

High-Energy Phantom?

High-energy physicists have had a lot to tantalize them in recent weeks. Last month, Los Alamos National Laboratory investigators said they had evidence that the chargeless and supposedly massless particles called neutrinos do indeed have mass. And shortly before that news came an even stranger report. The week before Christmas, physicists at England's Rutherford Appleton Laboratory announced that they had stumbled on what might be a hitherto unimagined particle.

Described in a press statement as "unexpected and so far unexplained," the surprise appeared in a neutrino-mass experiment known as KARMEN. Similar to the setup used at Los Alamos, it uses an atom smasher to create particles that then decay into neutrinos. Over a 4-year period, the KARMEN detector picked up a handful of interactions that seemed to occur long after all of the expected neutrinos would have either interacted with atoms in the detector or passed through without a trace. Conventional physics has no explanation for these interactions, and so the scientists wonder if the signals are coming from the decay of a new kind of particle. Because 20 feet of steel separates the detector from the neutrino source, Johnny Kleinsfeller of the KARMEN team says the particle would, like neutrinos, have to be able to pass through matter virtually unimpeded. But its delayed arrival would imply that it weighs 60 times as much as an electron and is a slow traveler.

The team is currently writing up its results in what Kleinsfeller admits will be a very cautious paper. With so few events detected, nobody is very confident that the particle exists—and there is nothing like it among the throng of particles predicted by theorists over the past decade.

Kleinsfeller says the group will continue to gather data over the next 2 years, and maybe the signal will get stronger. "That's all we can hope for," he says. "Proving that it is a particle decaying would require a different experiment. There isn't any experiment around that could prove us right or wrong, and there won't be for 4 or 5 years."

Liposomes for Home Diagnostics

Scientists at Lawrence Berkeley Laboratory (LBL), using a test for spotting influenza virus, say they have taken an important step in simplifying diagnostic tests so they can be used at home.

The scientists had already created a film of molecules that changes from blue to red after binding to the virus. But such films aren't practical because they degrade quickly. Now, in the 18 January issue of the *Journal of the American Chemical Society*, the researchers report they have stabilized the molecules by enticing them to self-assemble and link together into spherical particles called liposomes.

Deborah Charych, the group's leader, explains that the liposomes act as a single-step diagnostic because they are made up of two-part molecules. The first part, sialic acid, binds to receptors on the viral particles. When this happens it alters the shape of the links between the second part, long hydrocarbon chains. The shape change confines the electrons to smaller regions around the linkages, thereby altering the color of light reflected from blue to red.

While the assay gives a quicker signal than current lab culture techniques, Charych says it has a way to go before it can be marketed. The sialic acid is somewhat indiscriminate in what it binds to, being attracted to some bacteria as well as flu virus, so there is still a problem of false positives. So the researchers want to replace the sialic acid with molecules such as antibodies that are more specific for their target.

"We're not at the stage yet where we can incorporate such large proteins in our lipo-

somes," says Charych. Nevertheless, other researchers believe the LBL group is headed in the right direction. "It's a very interesting demonstration," says Howard Weetall, a biosensor specialist with the National Institute of Standards and Technology in Gaithersburg, Maryland. What's more, he says, there appears to be no reason that the process couldn't be generalized to other types of home tests—by replacing the sialic acid or antibody with a different receptor. Charych and her colleagues agree and are hoping to design similar tests for diagnosing various sexually transmitted diseases.

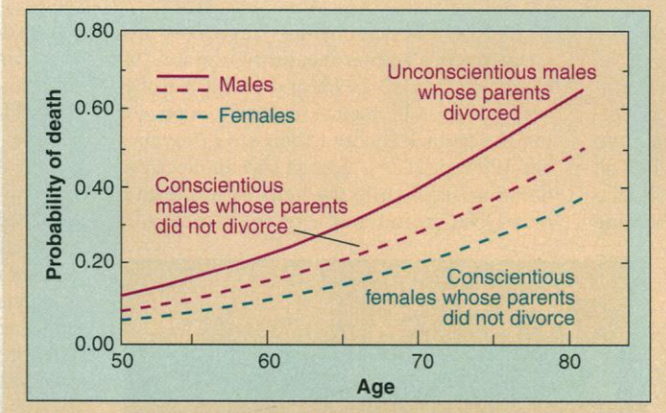
Italian Docs For the Chop

Italy has a population problem: It is suffering from the uncontrolled proliferation of physicians. With a total of some 300,000, evenly divided between public and private sectors, it has an oversupply of about 100,000, according to some estimates. The World Health Organization considers 3.5 doctors per 1000 people as optimal: Italy has 5 per 1000, at least twice the density of doctors in France and the U.K.

The situation is so bad that one third of Italy's doctors are not practicing full time, according to data from a joint university and health ministries commission. Now doctors, worried about their own jobs, want first-year intake into the country's 35 medical schools slashed from 7500 to 5000. The appeal was made in mid-February at a conference in Rome held by the national economy and labor council and the higher health council. It follows a press campaign mounted last summer by the doctors' federation, warning aspiring medics of the poor job market. They want further action in line with a 1990 law that limited admissions to the present 7500.

The matter is urgent, says health minister Elio Guzzanti, and numbers need to be fixed soon by new legislation. A meeting to propose lower intake levels, involving a joint university and health ministries commission and the national conference of medical faculty deans, is set for next month.

While Italy is churning out too many doctors, it's got shortfalls in other areas. The country doesn't have enough nurses and technicians or enough physicians with a specialty—now a requirement in medical education. More courses and grants are to be made available, but some estimates put the reorganization time at 5 years. Meanwhile, what with the bleak job market and rising fees for medical education, the oversupply problem may solve itself.



Temper and sex. Mortality lines for low-risk women (conscientious; nondivorced parents) versus high-risk and low-risk men. Probability of death by age 70 is double for the high-risk men, more than twice what the sex difference alone would predict.

Temperament for Longevity

Although pop psychologists often tout the health benefits of having an upbeat personality, recent results from a venerable longitudinal study suggest that stability and conscientiousness are more important for longevity.

In 1921, Lewis Terman launched a lifetime study of 1528 high-IQ California boys and girls. Half the sample have so far died, and now this elite group—whose fates are not confounded by poverty, ignorance, or discrimination—is being used to examine social and psychological factors associated with longevity.

After tracking down death certificates and poring over decades of personality tests, psychologist Howard Friedman of the University of California, Riverside, and colleagues in New York and California report in the February issue of *American Psychologist* that they've come up with a "psychosocial risk pattern for premature mortality." The pattern comprises two major elements. One is social instability, as indicated by parental divorce, which correlates with a loss of 4 years from a person's life-span. The other is a personality trait: conscientiousness. "Children, especially boys, who were rated as prudent, conscientious, truthful, and free from vanity ... lived significantly longer," the authors write.

The corollary is that being an ebullient extrovert doesn't do anything for your life-span: "Contrary to our expectations, we have found that childhood cheerfulness is inversely related to longevity," say the authors. Why? It often goes hand in hand with impulsivity, egocentrism, and arrogance, which, in turn, are linked with smoking, drinking, and general risk-taking.

Psychologist David Watson of the University of Iowa says these findings "have already shaken people up a little bit" because they show no particular health benefits from good cheer. Nonetheless, the authors write, "in terms of the rush toward death, the encouraging news may be that good guys finish last."

Cro Bagged

Cro, the Children's Television Workshop's attempt at a commercially appealing science cartoon show, will be cancelled in September by ABC TV after a two-season run. It and its two (noneducational) Saturday morning neighbors will be replaced by shows that are "believed to be stronger ratings performers," says an ABC spokesperson. In *Cro*'s time slot will go *Dumb and Dumber*, a cartoon about two moronic louts, derived from the movie of the same name.

Cro, modeled on a book called *How Things Work* by David Macaulay, features a Cro-Magnon boy who learns about laws of science with the help of a couple of woolly mammoths. The show's producer, Jeffrey Nelson, says it was CTW's first venture into the cutthroat world of Saturday morning network cartoons.

Nelson says that there were a number of "challenges specific to that arena." For example, two common things that happen to cartoon characters—"squash and stretch" in TV lingo—have limited applicability in the teaching of such topics as leverage and vibration. Nelson says he's surprised at the cancellation because the show's audience was expanding: "They moved us to noon recently and our ratings went way up." Not according to ABC, which says *Cro* was "not showing growth."

Extinct TV science. The cartoon *Cro* will go off the air this fall.