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Joshua Lederberg

# The Infamous Black Death May Return to Haunt Us

In mid-14th century, the Crimean seaport of Caffa (now called Feodosia) was an important fortified outpost of Genoese traders. For the previous 50 years, Genoa had been in intermittent conflict with Venice, and with factions of the Mongol Golden Horde. The famous Travels of Marco Polo were written while this Venetian adventurer was a prisoner-of-war in the hands of the Genoese.

In the year 1346, Caffa was again besieged by the Mongols. During this same time, a vast epidemic of bubonic plague had rapidly spread through the Mongol empire. In the words of Gabriel de Mussis, a contemporary chronicler, "The Tartars, fatigued by such a plague and pestiferous disease, stupefied and amazed, observing themselves dying without hope of health, ordered cadavers placed on their catapults and thrown into the city of Caffa, so that by means of these intolerable passengers the defenders died widely."

After this bacteriological attack, the survivors abandoned the city and returned to Genoa as best they could. By 1348, the Black Death had devastated Europe.

DR. V. J. DERBES of Tulane Medical School, writing in the Journal of the American Medical Association (April 4, 1966), pointed out that the plague would undoubtedly have reached Europe by trade routes, regardless of this incident. Nevertheless, what is known of the spread of the Black Death, starting from the Italian seaports, is consistent with attaching it to the return of the Genoese ships from Caffa with a heavy cargo of infected rats and fleas.

PLAGUE IS STILL with

us. It is usually associated with tropical, rat-infested environments, and indeed it was again killing a million people a year, mostly in India, at the time of World War I. Since World War II, vigorous rat-eradication programs have succeeded in holding plague deaths down to a few hundred.

The disease has, however, gradually spread to native, wild rodents throughout the world, where it smolders, only to break out in an isolated case or small epidemic of "sylvatic" or forest-living plague. The deprivations of war, as in Vietnam, also foster new outbreaks of plagues.

As far as we know, these outbreaks are caused by the same bacillus that spread the Black Death. However, the organism does show considerable variation under laboratory conditions. An epidemic of the Black Death may have reflected the evolution of some especially virulent and contagious form of the bacillus. Fortunately, streptomycin and a few other antibiotics are remarkably effective.

NEVERTHELESS, human ingenuity is quite capable of wasting the good fortune of the human species. Mutant strains of the bacillus that are indifferent to antibiotic therapy are easily cultured.

The potential of plague for biological warfare (BW) is obvious in the light of the historic precedents. Any intelligent program of BW research, especially if its main mission were "defensive," would have to develop aggressive, drug-resistant bacilli in order to evaluate them as a military threat. BW research must

also be concerned with the factors that encourage the airborne spread of pneumonic plague.

The Black Death of 1346 probably could have been contained with the resources of modern medicine. When hostile bacilli have been augmented by human intelligence, however, any confidence that they can be contained is a delusion.

The disastrous course of present-day Soviet militarism makes it vastly harder to attempt a world settlement for the surveillance and control of BW agents. But BW can add nothing to the strategic power of nuclear-armed states. If in nothing else, we should be able to find a common cause in protecting ourselves from a recurrence of pestilence. Or must we console ourselves with the recollection that the Black Death helped pave the way to the Renaissance?

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