

The greatest threat of all

In 1991 cholera struck Peru in epidemic proportions. According to the World Health Organization (WHO) in Geneva, it was the first appearance of cholera in the Western Hemisphere in the twentieth century. In 1992, a new strain of cholera was identified during an epidemic in India. Cholera is now endemic in at least 36 African nations.

Epidemics of yellow fever in the Rift Valley of Kenya occurred in 1992 and 1993. They were initially misdiagnosed as malaria. Yellow fever has also been reported in Latin America and the Caribbean for the first time in decades, as has dengue fever. In 1994 India was plagued by two outbreaks of plague, the first since 1967 (p. 1237).

Waterborne cryptosporidiosis is known to have afflicted 400,000 people in the United States in 1993. There is every reason to suspect that the nation's water supply generally is more microbially polluted now than it has been for generations. Today, there are a total of 13,109 reported cases of tick-borne Lyme disease in the states. Little more than a decade ago, there were 197.

Eastern Europe and the former Soviet Union have been experiencing a resurgence of diphtheria since 1990; WHO officials cite war, huge numbers of refugees, and a shortage of vaccines and antibiotics for failure to bring diphtheria under control.

This year, as readers around the world learned in *The Hot Zone* about an Ebola threat in a suburban town just outside of Washington, DC, real outbreaks of Ebola haemorrhagic fever killed 245 citizens and health-care workers in Zaire. The high drama of *The Hot Zone* (*Nature Medicine*, 1, 89) has tended to make people think of it as fiction. But neither the drama nor the virus were imaginary. And, as David Heymann, director of the World Health Organization's division of emerging diseases, says, "... an outbreak of Ebola near an airport could mean [that] the disease is exported half way across the world in a matter of hours."

Because of an ageing population, the frailties that mark old age — Alzheimer's, Parkinson's and osteoporosis among them — rightly demand the attention of biomedical research. For reasons that remain unknown, the actual incidence of certain cancers is rising in Western nations. This, too, is a phenomenon of grave concern.

But there is no single problem that is more pressing

than our fast-deteriorating relations with the microbial world. An outbreak of disease in one country is likely to repeat itself in another. Altogether, 29 new or re-emerging diseases have been recorded by World Health officials during the past two decades. And, throughout that period, these same, often beleaguered individuals, have begged governments to pay attention.

Some action is being taken. For instance, the G7 nations agreed at the Halifax summit to support 11 pilot projects for a global information infrastructure to track and report disease outbreaks. And the WHO persists in its attempts to develop a worldwide alert network for disease surveillance (p. 1234).

But it is plainly not enough. It is well-known that microbes exposed repeatedly to antiviral or antibiotic agents can rapidly develop an astonishing measure of drug resistance. For years, this has not been an area of special interest to

either academic scientists or pharmaceutical companies, especially when the latter see a modest return on their investment.

Certainly government agencies such as the US National Institutes of Health, the British Medical Research Council, the Indian Council of Medical Research, and others could do a better job by directing significant sums of money into relevant areas of research. Pharmacology, rational drug design, and epidemiology are examples.

A particularly interesting idea that emerged from a US government working group on infectious diseases is the suggestion that researchers, physicians, and nurses be trained to identify and report "the unusual". This observation from its report is telling: As early as 1962, African doctors apparently witnessed cases of what was then known as 'slim disease'. Had the international community taken notice, epidemiologists might have gained a head start in learning how AIDS is transmitted and prevented.

Funding for the study of the physiology, genetics, and pathogenesis of microbes should also be on the list of areas targeted for new funds, even if it means reducing funding elsewhere. There is abundant evidence that talent follows money in science (as in other walks of life) and there is abundant evidence that of all the life-threatening diseases that plague us, a hostile microbial world represents the greatest threat of all.

Barbara J. Culliton

