



Joshua Lederberg

We Can Make a Safer World By Dropping Work on Toxins

LAST Nov. 25, President Nixon announced a major step in U.S. policy concerning biological weapons. They "have massive, unpredictable and potentially uncontrollable consequences," he said. "They may produce global epidemics and impair the health of future generations. . . . The U.S. shall renounce the use of lethal biological agents and weapons and all other methods of biological warfare. The U.S. will confine its biological research to defensive measures such as immunization and safety measures."

The President also asked the Senate to ratify the Geneva protocol of 1925, which prohibits the first use in war chemical as well as bacteriological weapons.

Many scientists, including myself, have urged a still more decisive initiative toward the general prohibition of research and development in the field of chemical warfare. This was not done, probably in the belief that the Geneva protocol was a sufficient step toward driving hard bargains with the Soviet Union on disarmament issues. But this reflex, orientation to the Soviets overlooks the greater threat to our security from the lack of a world system to control the proliferation of cheap but nasty and unreliable weapons among smaller powers.

THE PRESIDENT'S statement has now become the

subject of a sharp debate about its application to toxins. These are complex chemical compounds, often proteins, which are produced by many living organisms, including infectious microbes. In some diseases like food poisoning, diphtheria or tetanus, an easily isolated toxin plays a central part in the lethal action of the responsible bacteria. In more subtle fashion, a toxin is probably connected with every infectious disease, but we do not always know enough to be able to isolate the crucial molecule. The understanding of toxins is obviously a central issue in disease research.

Military research is also much interested in toxins. Much has been said about their enormous potency; a half pound of botulinus toxin "properly distributed" would do in all of North America. But their real attraction is the possibility of immunizing the attacking forces and their allies.

Our emotional revulsion against such agents should not becloud either their classification or the precise reasons to develop better policies to deal with them. Toxins are undoubtedly chemical poisons, not living agents. President Nixon's principal reason for renouncing U.S. use of biological agents, the unpredictable chances of epidemics outside the theater of combat, does not apply to toxins.

Toxins, nevertheless, are now produced by industrial processes that can hardly be distinguished from the production of vaccines or of bacteriological weapons. It will be impossible to sustain the credibility of our renunciation of such weapons if we continue secret research and pilot plant development on toxins. Nor can we visualize any system of inspection or verification of international agreements that would expose bacteriological work and leave toxins concealed.

THIS IS NOT an argument to redefine the sense of chemical weaponry, which could have serious

side effects in deterring national leaders from stepwise advances in policy. Rather, the toxins present a special problem, separate from biological weapons. We will help make a safer world if we set an example by eschewing secret military work on the production of toxins from microbes, as well as the microbes themselves.

The possibility also exists of synthesizing known toxins, and designing new ones, by chemical methods. It will be an unhappy day if we promulgate that art by applying more energy to developing the technology than to vital global controls.

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