Letters

Purified Antigen Vaccines

I would like to expand and clarify one point in the report by Thomas H. Maugh II, "Influenza (II): A persistent disease may yield to new vaccines" (Research News, 15 June, p. 1159). Maugh states that "Work with influenza . . . has shown that the ability of purified antigens to stimulate the production of antibodies is significantly reduced when they are separated from the virion."

It is true that certain purified antigen (viral subunit) vaccines have proven serologically ineffective when tested in humans. However, serologic efficacy depends in part on the physical form of the immunizing antigen, which in turn derives from the method used for particle disruption and antigen extraction. At least three disruption procedures—utilizing ethyl ether (*1*), sodium deoxycholate (*2*), or tri-*n*-butyl phosphate (*3*)—are known to yield purified antigen preparations generally free of the bothersome side effects associated with whole-virus vaccines and with specific serologic potency at least equal to and probably greater (*4*) than that of the latter products. Antigen vaccines prepared by one or another of these procedures have been on the market in the United States and Australia for the past 5 years, and the many millions of doses used each year attest to their wide acceptance by the medical profession. Thus, it would be incorrect to leave the impression, as Maugh does, that all purified antigen vaccines are subpotent products awaiting new technological advances to bring them to practical use.

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The Frog Revisited

Papermaster and Gralla (Letters, 6 April, p. 10) and Emmons (Letters, 15 June, p. 1118) advocate the use of tetracycline as a stopgap solution to the problem of disease in the laboratory frog *Rana pipiens*. Data recently collected in our laboratory partially support their contention but also indicate potential problems in the use of this single therapeutic approach on the diseased bullfrog *Rana catesbeiana*. The application of tetracycline was based on the assumption that aeromonads were the major pathogens of frogs (*1*). The selection of this antibiotic was certainly a wise choice, as the majority of our isolated presumptive bacterial pathogens were shown to be sensitive to the tetracycline treatment. Thus 5 milligrams per 30 grams of body weight administered by stomach tube for 5 days (*2*) or 0.9 milligram per 30 grams of body weight injected into the dorsal lymph sac for up to 2 days after the disappearance of the clinical symptoms reversed the classical redleg syndrome, and mortalities were substantially reduced.

Within 1 week after the initiation of the antibiotic therapy, approximately 20 percent of our treated animals died. *Aeromonas* was not isolated from the dead animals. Death in these animals was not preceded by observable clinical symptoms, as in the case of redleg disease, and the bacteria isolated from these animals belonged to two genera—*Corynebacterium* and *Flavobacterium* (subsequently shown to be resistant to tetracycline)). The pathogenicity of these isolates was confirmed by reinoculation into an adult frog. The presence of these three organisms in diseased bullfrogs suggests a complex ecological interaction in amphibian disease processes.

These observations emphasize the need for determining both the identification and antibiotic sensitivities of presumptive pathogens within individual frog colonies. Without this information the initiation of successful antibiotic therapy is not only difficult but incomplete. Disease control in the Louisiana bullfrog population appeared to be achieved by expanding the tetracycline therapy to include 0.9 milligram per 30 grams of body weight each of sulfathiazole and erythromycin. Additional prophylaxis was achieved by immersion of tadpoles, but not the adult frog, in the same antibiotic solutions prepared in 3.0 percent dimethyl sulfoxide.

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Technology Assessment and the University

Michael S. Baram's conceptual framework for technology assessment and social control (4 May, p. 465) brings into perspective the need for a "flow of information . . . coherent and balanced . . . [which] must present alternatives with their uncertainties in comparable terms." Universities should take up this task. This job, if well done, would convince citizens and legislators that academia can make valuable contributions to the solution of urgent national and world problems. It would do much to counteract the antiacademic attitude which is growing in the land.

Rather than staging "teach-ins" which affect primarily the university community, and protests which usually leave a negative flavor, academia should stage "hear-outs" which would reach the citizens through well-planned mass media programs, including independent review of all alternatives and two-way discussions with citizens of how to assign values and weights to environmental and social amenities.

Universities are in part responsible for the growth of specialized knowledge which is threatening to outstrip our collective ability to control its effects on our lives. Shouldn't we therefore assign to universities the task of helping us keep technology under control? For example, when an issue has been raised by an advertisement of a commercial product on television or radio, the "Fairness Doctrine" discussed by Baram could be invoked, and a government-supported university could be charged