On June 17 Fredrickson wrote to Richard S. Schweiker, Secretary of Health and Human Services, of his decision to resign. "I take this step with great ambivalence, for NIH is in the very marrow of my bones. I very much appreciated your immediate invitation to continue in my post upon your taking office as Secretary ...." Schweiker responded that it was "with profound regret" that he learned of Fredrickson's decision.

After leaving NIH, Fredrickson plans to spend a period as a visiting scholar at the National Academy of Sciences "to sort out options," he told SCIENCE NEWS. There he expects to get involved with issues of support for scientific research and of institutional stability.

Asked whether times were getting rougher for NIH, Fredrickson replied, "No, I see no period of chaos. All public institutions are traveling through choppy water. But I have no fears for NIH."

Fredrickson looks back "with some pride" on his period as NIH director. "It was a very exciting six years. We could find and create solutions for most of our problems," he says. "We never felt anything was insoluble."

Among the problems Fredrickson faced was "everything associated with the recombinant DNA guidelines." That issue took up approximately half his time in his first years as director. He now describes the guidelines as the first restrictive code for biological research, a balance of scientific imperatives and public interest achieved without restrictive law.

Defining the boundaries of NIH responsibility was another issue Fredrickson addressed. "They were very ragged when I came," he says. He was concerned about protecting scientists' objectivity, while at the same time having them take appropriate responsibility. To meet this goal, NIH has instituted technical consensus exercises as a discussion process in which scientists, doctors, patients and others evaluate new medical technologies.

Fredrickson sees a need, in order to "make practical success out of biology," to cope with problems at the rough interface of university, government and industry, where it is necessary to take a complex scientific area and get all the people to work together. He says that this was possible in a "bureaucratic tour de force" for the issue of biological effects of radiation. "I find that very satisfying. It was even tougher than recombinant DNA."

Finally, Fredrickson is pleased to have been able to "anticipate the austerity likely to come." For example, recent budgets stabilized the funding of biomedical research to 5,000 new and competing grants. "This," he says, "makes a big difference to the confidence of people who take up biomedical research."

So far there is no word on whom Fredrickson's successor may be. Fredrickson says, "I just hope it's a good person, it's a very nice big job, and important." □

Gene-splice vaccine for foot-and-mouth

It's the first vaccine to be produced with recombinant-DNA technology, and it could lead to "annual savings of billions of dollars and an increase in the world's supply of meat," says Department of Agriculture Secretary John R. Block. The vaccine, which is being produced in genetically engineered bacteria, consists of a single protein of the coat of the virus that causes foot-and-mouth disease. Tests conducted during the past eight weeks have shown it to be effective against that disease.

Foot-and-mouth is a severe, highly contagious disease that affects more than 30 species of animals, including cattle, sheep and pigs. It causes blisters on the mouth, nose and feet — weakening animals and reducing their agricultural value. Foot-and-mouth disease is an especially serious problem in Asia, Africa, Latin America and southern Europe. Strict importation screening and quarantine procedures have prevented outbreaks of the disease in the United States since 1929.

Seven types of the virus, and 65 subtypes, are implicated in the disease; animals immune to one type are still susceptible to the others. And although there are no treatments for foot-and-mouth, there have been vaccines that protect against it. The vaccine currently in use contains killed or attenuated virus matched to the existing disease in an area. An estimated 500 million doses are used annually, making it the most widely used antiviral vaccine. This vaccine, however, is difficult to use in developing countries because it must be refrigerated. In addition, incomplete attenuation of virus has resulted in outbreaks of foot-and-mouth disease among vaccinated animals.

In contrast, explains Block, "The vaccine produced by the new recombinant DNA technology is safe and effective. It cannot produce the disease in vaccinated animals because only a segment of the virus is used, not the whole virus. Also, the vaccine produced with the new technology can be stored for long periods of time without refrigeration. It is economical to produce, and greater quantities can be produced at a time than was possible under previous methods of production."

The new vaccine is a result of collaboration between scientists of Genentech, Inc., a South San Francisco genetic engineering company, and the U.S. Department of Agriculture. The team was led by Howard L. Bachrach, who had previously demonstrated that a single protein, called VP_3, of the four on the foot-and-mouth disease virus surface, produces immunity in animals without causing infections (SN: 2/19/77, p. 120). The work was carried out on Plum Island, off the tip of Long Island in New York, because federal law prohibits the keeping of intact foot-and-mouth disease virus on the U.S. mainland.

The USDA announcement follows a recent report that German scientists have spliced genes into bacteria to produce a surface protein of the foot-and-mouth disease virus (SN: 3/7/81, p. 150). The German and U.S. teams produced different viral surface proteins (VP_1 and VP_3, respectively), and the USDA-Genentech group reported a higher yield — more than a million molecules of viral protein per bacterial cell compared with only 1,000 molecules per cell reported by the German group. The new vaccine protects against only one common type of the virus, but work toward a more general vaccine is underway.

The business agreement between Genentech and the USDA involved no money. Genentech holds patent rights and the right to license the manufacture of the vaccine, but the USDA retains the right to use the vaccine without paying royalties any time it is needed in this country. Genentech plans to manufacture and sell the vaccine, which it estimates to have a $200 million annual market, under an agreement with the fertilizer manufacturer, International Minerals of Northbrook, Ill. Commercial production is expected to begin in the mid 1980s. □

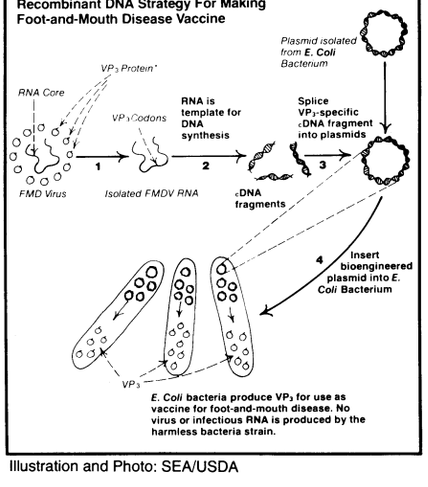

Illustration and Photo: SEA/USDA

Howard Bachrach