Letters

Agent Orange Studies

Marcia Barinaga's article "Agent Orange: Congress impatient for answers" (News & Comment, 21 July, p. 249) may leave the impression that the American Legion study is the first epidemiologic investigation of Vietnam veterans. Such is not the case. In fact, Agent Orange and its notorious contaminant dioxin (2,3,7,8-tetrachlorodibenzo-*p*-dioxin) differ from most environmental toxicants because of the volume of information that has been accumulated about them.

There can be no doubt that the Air Force personnel who served in Operation Ranch Hand and sprayed 90% of the Agent Orange in Vietnam got the greatest exposures there. The concentration of dioxin in their blood fat now averages 38 parts per trillion (ppt), the highest concentration being greater than 300 ppt. The average is more than seven times greater than the average concentrations (<5 ppt) found in the blood fat of veterans of ground warfare in Vietnam, as well as in that of veterans who did not serve in Vietnam. Skin cancers of the sort usually associated with exposure to the sun are more frequent in the Ranch Hand veterans than in a nonexposed control population, but incidence of none of the health effects reported in the American Legion study is higher.

Neither are those effects elevated among residents of Seveso, Italy, where a chemical plant explosion in 1976 exposed more than 35,000 people of all ages to varying amounts of dioxin. Twelve years of medical examination and follow-up have not convincingly demonstrated increased rates of any disease except chloracne, which is associated with high dioxin exposure.

Several chemical plant accidents around the world in the 1940s, 1950s, and 1960s exposed workers to high concentrations of dioxin that caused chloracne. There are no consistent findings of elevated rates of cancer, other serious diseases, or premature death in those populations.

Discussions of the health effects associated with Agent Orange and dioxin have been fueled by contradictory results. In general, associations between exposures and disease (except chloracne) have been made in populations in which we are least certain of exposure. Studies in highly exposed populations have failed to verify those associations. The two cancers now most commonly associated with exposures to Agent Orange and dioxin—soft tissue sarcomas and non-Hodgkins lymphomas—fit that pattern. In any event, much more definitive information will be available in March 1990, when the Centers for Disease Control is scheduled to release the results of a study of the occurrence of six cancers, including soft tissue sarcomas and non-Hodgkins lymphoma, among Vietnam veterans.

Agent Orange is one of the last vestiges of the nation's torment over the Vietnam War. Many members of Congress as well as many citizens are ashamed of our treatment of Vietnam veterans during and immediately after the war, a feeling that I share. But that guilt also fuels the continued search for evidence that Agent Orange "did" something to the health of veterans. It is ironic that the mental and emotional anguish caused by all wars is largely ignored while we search in vain for a chemical cause for diseases that occur as frequently in nonveterans as in veterans, and, so far as can be told, as frequently in veterans not exposed to Agent Orange as in those who were exposed. This is not the way to right any wrongs that may have been done.

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Barinaga portrays the American Legion–funded study of Vietnam veterans (*1*) as the centerpiece of a congressional hearing. While we believe that our study shows the fallacy of the Centers for Disease Control (CDC) contention that it is not possible to analyze the relationships between herbicide exposure and health on the basis of available military records (*2*), the hearing only tangentially focused on our previously published analysis.

A major focus of the hearing—and of the American Legion panel, in which our collaborators, Jeanne Mager Stellman and Steven D. Stellman, participated—was the massive data available on troop movement and herbicide spraying abandoned by the CDC. The data comprise hundreds of thousands of records of specific locations and dates of troop movements, including records of daily troop movements , over at least 30 months, of 50 combat battalions that served in the Third Corps tactical zone of South Vietnam, coded down to the company level, and about 75,000 other records of dates and locations of marine and army units in the other military combat tactical zones.

In addition, we described and illustrated at the hearings more than 22,000 detailed records of the spraying of some 12 million gallons of Agent Orange and 19 million gallons of all herbicides in Operation Ranch Hand compiled by the National Academy of Sciences and supplemented by the U.S. Army and Joint Services Environmental Support Group. We showed clearly many instances of "direct" hits and great differences between sprayed and unsprayed areas, all of which can be used as the basis for clinical, environmental, and epidemiological studies. The CDC has never demonstrated why these data are not useful for epidemiological and other studies.

Science readers deserve to know about the rich data available on herbicide exposures in Vietnam and the grave problems associated with the methods used by the CDC in their congressionally mandated Agent Orange study. The CDC has expended nearly $63 million of public funds on its Vietnam veteran research. The American Legion is currently working with the Stellmans to develop a mechanism by which the data on exposure and military units, which the Stellmans have painstakingly reduced to practical size, can be shared with the research community for future much needed work on the health and well-being of Vietnam veterans.

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"Radiation-Induced" Cancer

I was surprised to read in Eliot Marshall's article about fallout on Rongelap Atoll that the nephew of a Marshall Islands senator had "died of radiation-induced leukemia" (News & Comment, 14 July, p. 123). Radiation-induced cancer, including leukemia, is indistinguishable from cancer that arises from any other cause. It is impossible for any physician or pathologist, no matter how skilled he or she may be, to be able to say unequivocally that any cancer would not have occurred but for exposure to radiation. The best that can be done is to estimate the probability, on the basis of the size of the radiation dose, that any particular cancer is due to radiation. When a large population is exposed to a carcinogen such as radiation, the carcinogenic effect can only be deter-