maintained that long-term survival of the centers depends on coverage of mental health services by national health insurance. Now this kind of coverage is more critical than ever.

On the manpower side, it looks as though the manpower and training programs division, as we know it, will become a thing of the past. No longer will awards be made along specific disciplinary lines—psychiatry, psychology, social work, and psychiatric nursing. The only programs to be retained will be experimental and training programs for various kinds of nonacademic mental health workers; short-term grants for continuing education; and new careers grants, which mainly go to helping indigenous mental health workers move up the career ladder.

In addition to experimental programs, the division will emphasize program evaluation, the study of manpower needs, and the provision of technical assistance to institutions, states, and localities in order to help them develop training capacities.

The sudden curtailment of training money is hitting institutions with varying degrees of severity. One hard-hit school is Stanford Medical School, where, says Bert S. Koppell, the number of new graduate students accepted will have to be curtailed next year, and acceptance will have to be biased toward those who can pay their own way. Koppell says there will also be serious impact on the quality of training. The idea of a psychiatric residency, for example, is to expose residents to as much variety as possible, which means doing a good deal of community work. Now residents will have to be placed in hospitals where they can do income-producing work. This means, too, that mental health centers are being squeezed from both ends, since they have relied heavily on the voluntary services of these professionals.

One area in which the predominance of the NIMH seems assured is drug abuse, which is getting cancer crusade–type treatment. If the Office of Management and Budget has its way, the budget will go up from an estimated $205 million in 1973, to $243 million in 1974 for research, training, matching grants to states, and individual project grants.

As of the end of next year, the Division of Narcotics Addiction and Drug Abuse will become the National Institute of Drug Abuse, parallel in stature to the National Institute for Alcoholism and Alcohol Abuse (NIAAA) and considerably more richly endowed. The institute will take over the primary functions—policy-making and coordination of federal drug abuse prevention activities—of the Special Action Office for Drug Abuse, which is due to expire in June 1975. Meanwhile, the treatment and rehabilitation programs of the almost-defunct Office of Economic Opportunity, the Model Cities program, and the Law Enforcement Assistance Administration are being transferred to the NIMH.

The NIAAA, the newest service-oriented division at the NIMH, will not have the opulent future originally planned for it. Matching grants to states will continue, but project grants are being phased out. However, Director Morris Chafetz says that all of the states have set up the single alcoholism authority required to receive federal money, and enthusiasm is such that local support is likely to be continued. Again, this optimism is not shared by private groups such as the National Council on Alcoholism, which believes fledgling programs will fall flat when the federal rug is pulled out from under them.

Research at the NIMH is feeling the pinch too, although, as one official said, "We're lucky compared to the rest of the institute." The proposed 1974 budget for general (nondrug, nonalcohol-related) research is $79.9 million, down $6.5 million from 1972. Extramural research is slated to get $41.9 million, the same as for 1973.

Research throughout the NIMH will become more oriented to high-priority areas such as child mental health, crime and delinquency, drug and alcohol abuse, social problems such as violence, and basic research on the major mental disorders: schizophrenia and depression.

Intramural research, traditionally oriented to basic research on mental diseases, is being funded at an annual level of about $16.5 million. Here, too, reduced resources are being concentrated on high-priority areas.

Further slippage in the total research budget may be slowed by a major, year-long study now being made of all NIMH research conducted over the last 25 years. The task force, headed by Julius Segal, is divided into ten study groups, which are expected to produce a report next month assessing past efforts and outlining future research strategies.

The NIMH has a reputation for getting into research that is relevant to current social problems—which has earned it the nickname of the "band-aid institute" in some quarters. Some officials fear these areas may be emphasized to the detriment of the agency's original purpose, which is to find causes and cures for major mental diseases.—CONSTANCE HOLDEN

Herbicides: AAAS Study Finds Dioxin in Vietnamese Fish

Fish and shellfish from areas of South Vietnam that were heavily sprayed during the U.S. defoliation campaign contain significant quantities of dioxin, according to two Harvard scientists, Robert Baughman and Matthew Meselson. Dioxin, a contaminant of some herbicides, is known to be an extremely potent agent in causing birth defects. The finding is the first solid evidence that dioxin entered the diet of the Vietnamese people and could, thereby, have posed a hazard to human health there.

The fish were bought in 1970 from markets where Vietnamese housewives also obtained their fish. "We will not say this poses an immediate problem to health . . . but there is plenty of room to be worried," said Meselson. "There is no evidence for catastrophic illness, but whether it was making significant, but not catastrophic, health problems, we don't know."

The two scientists have cautiously refrained from asserting that finding dioxin in fish proves that U.S. herbicides are responsible for reported rises in stillbirths and birth defects in heavily

sprayed provinces of South Vietnam. Their report speaks to that point more gingerly, saying that dioxin "may have accumulated to biologically significant levels in food chains in some areas of South Vietnam exposed to herbicide spraying." They presented their paper on 2 April at a conference on dioxins sponsored by the National Institute for Environmental Health Sciences.

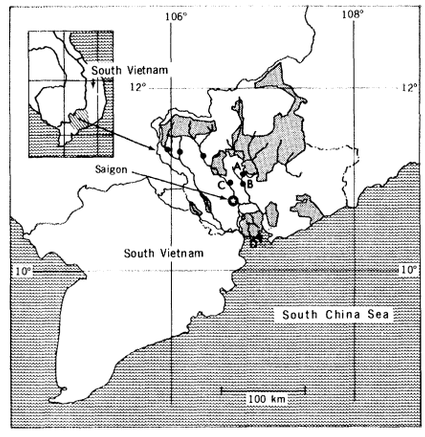
The disclosures brought an immediate response from the Center for the Study of Responsive Law, an organization associated with Ralph Nader. The center called on Environmental Protection Agency (EPA) administrator William Ruckelshaus to suspend all uses of 2,4,5-T and Silvex—two dioxin-containing herbicides now in wide use in the United States. The center also urged Ruckelshaus to begin a systematic hunt for dioxin in food chains in this country.

A second policy repercussion of the Baughman-Meselson paper would be to further hamper Air Force plans to sell up to 2.3 million gallons of surplus Agent Orange to Brazil, Venezuela, and Paraguay (see *Science*, 6 April). The center's letter to Ruckelshaus also urged him to reject an Air Force application to EPA to approve the Agent Orange stocks for domestic use. By a series of current policy decisions, such approval would open the way both for domestic use of the Agent Orange and for foreign export.

Meselson collected the fish samples in 1970 during a study trip made by the AAAS Herbicide Assessment Commission which he headed. The samples were frozen, Meselson says, until he and Baughman could develop a new and highly sensitive technique for measuring extremely small amounts of dioxin. The commission has so far produced only one 8-page report, and no firm date is set for the completion of the final report to the AAAS.

The fish were taken from four locations in Military Region III, which includes Saigon and several provinces north of it (see map). Samples were found to have an average dioxin* concentration of 540 parts per trillion (ppt) with the range being from 18 to 814 ppt. Other researchers have shown that guinea pigs fed with dioxin at a concentration of 600 ppt have only a 50 percent chance of survival.

Precisely how the fish became contaminated with dioxin is still a mystery.



Map shows collection sites of Vietnamese fish and shrimp along Dong Nai River (A and B), Sai Gon River (C), and coast at Can Gio (D). Mothers' milk samples were also taken at these four sites and at three others northwest of Saigon. Shading indicates areas most heavily sprayed with herbicides.

Dioxin is known to be present in Agent Orange, the principal herbicide used by the United States in Vietnam from 1962 until 1970 when its use was ordered discontinued following reports of possible teratogenic effects.

"We haven't ruled out other sources for the TCDD [dioxin]," Meselson said in an interview. "No one could prove that at each of these four sites some culprit didn't come along and dump some Orange. You don't have to be a scientist, however, to figure out that that is very unlikely." Does this mean that the dioxin is moving up the food chain in the Vietnamese environment? He replied: "The simple finding of TCDD in one category of sample at one time only suggests, but does not prove, the possibility of bioaccumulation. . . . These results suggest accumulation but do not prove it." Dioxin has been shown by other researchers to be cumulative in monkeys.

Interest in dioxin, a proven teratogen in laboratory animals, intensified after reports by the AAAS Herbicide Assessment Commission and other groups in 1970 indicated that in Vietnam, coincident with the spraying of Agent Orange, the numbers of stillbirths, placental tumors, and malformations rose. But finding that dioxin entered the Vietnamese diet does not, so far, prove that herbicides caused the rise in birth defects in Vietnam. John Constable, of the Harvard Medical School and Massachusetts General Hospital and the medical member of the AAAS team, says the Baughman-Meselson study has "greatly increased my enthusiasm for looking into this. Their work is impressive in that it shows that in towns away from the direct exposure to the spraying, dioxin is present."

Constable urged wider sampling of human tissue to ascertain whether people there do in fact carry body burdens of dioxin. Indeed, this question could be answered when Baughman and Meselson complete their analyses of Vietnamese mothers' milk, which they collected from women at the same time as they collected the fish samples in 1970. Although they say the work on mothers' milk will be ready in a few months, both scientists are keeping absolutely mum about their first test results.

The new Baughman-Meselson detection method, in which "time-averaged" mass spectrometry is used, lowers the detectable limit of dioxin to parts per trillion levels. "Our method is approximately 50,000 times more sensitive than previous methods," Baughman says. He said it can be used for seeking dioxin at these levels in any substance—soil, tissue, or ground-up fish—unlike other methods. Now, in addition to the Vietnamese mothers' milk, they plan to analyze samples of beef liver taken from animals grazed on rangeland sprayed with 2,4,5-T, a dioxin-contaminated herbicide whose continued use in the United States remains a subject of controversy. Aside from being very sensitive, the new method has the advantage of being able to distinguish dioxin from other substances more effectively than conventional techniques can.

Constable, who has reviewed the paper, terms the new technique "indubitably elegant." But Fred Tschirley, pesticide coordinator for the Department of Agriculture, indicated that, although the Baughman-Meselson findings were cause for concern, he wanted corroboration of the results by another laboratory. He stressed that he had high confidence in both Meselson and Baughman, but added that "there are already so many bad numbers in the literature on this, I'm always bothered by results that come from only one laboratory."

The new findings come at a time when other research on dioxin indicates that it is very harmful even in very minute doses. So, no matter what these findings eventually prove about the effects of the U.S. herbicide spraying in Vietnam, they will most probably have an impact on controversies in this country over the use of dioxin-containing chemicals, especially over 2,4,5-T and Silvex.

—DEBORAH SHAPLEY

* Dioxin is really a family of chemicals, each of which acts differently. The most important is 2,4,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD), which appears as a manufacturing impurity and causes a range of toxic and teratogenic effects.