does not put ethyl lead in most of the gasoline it produces. This may be due to technical lag as much as to considerations of health, but the result is considerably more lead-free gasoline. Similarly, the Russians have not permitted as much emphasis on consumer-goods production as we have in the West. Consequently there is less waste to discard. Russian consumers may be somewhat less enthusiastic about this than the ecologists and conservationists, but in the U.S.S.R. there are no disposable bottles or disposable diapers to worry about. It also happens that, because labor costs are low relative to the price of goods, more emphasis is placed on prolonging the life of various products. In other words it is worthwhile to use labor to pick up bottles and collect junk. No one would intentionally abandon his car on a Moscow street, as 50,000 people did in New York City in 1969. Even if a Russian car is 20 years old, it is still valuable. Because of the price relationships that exist in the U.S.S.R., the junkman can still make a profit. This facilitates the recycling process, which ecologists tell us is the ultimate solution to environmental disruption.

It should also be remembered that, while not all Russian laws are observed, the Russians do have an effective law enforcement system which they have periodically brought to bear in the past. Similarly, they have the power to set aside land for use as natural preserves. The lack of private land ownership makes this a much easier process to implement than in the United States. As of 1969, the Soviet Government had set aside 80 such preserves, encompassing nearly 65,000 square kilometers.

Again because they own all the utilities as well as most of the buildings, the Russians have stressed the installation of centrally supplied steam. Thus, heating and hot water are provided by central stations, and this makes possible more efficient combustion and better smoke control than would be achieved if each building were to provide heat and hot water for itself. Although some American cities have similar systems, this approach is something we should know more about.

In sum, if the study of environmental disruption in the Soviet Union demonstrates anything, it shows that not private enterprise but industrialization is the primary cause of environmental disruption. This suggests that state ownership of all the productive resources is not a cure-all. The replacement of private greed by public greed is not much of an improvement. Currently the proposals for the solution of environmental disruption seem to be no more advanced in the U.S.S.R. than they are in the United States. One thing does seem clear, however, and that is that, unless the Russians change their ways, there seems little reason to believe that a strong centralized and planned economy has any notable advantages over other economic systems in solving environmental disruption.

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NEWS AND COMMENT

Herbicides in Vietnam: AAAS Study Runs into a Military Roadblock

The team that the AAAS sent to study the effects of the military use of herbicides in Vietnam has been hospitably received by authorities there—but has been denied access to information that is important to the success of the study. One possible interpretation might be that the team lacks experience in the complexities of working through government channels in a war zone. Another interpretation might be that the AAAS investigators were deliberately given a glad-hand reception, and a runaround.

The team, which is headed by Harvard biologist Matthew S. Meselson, spent 5 weeks in South Vietnam this past summer conducting a pilot study and laying plans for a more elaborate follow-up investigation of defoliation. In most respects Meselson and his colleagues seem to have received red carpet treatment from civilian and military agencies. They were ferried around Vietnam in helicopters, small boats, and motor cars, were bedded and fed in government facilities, and were given access to the top two American officials on the scene—namely, Ambassador Ellsworth Bunker and General Creighton Abrams—as well as a host of lesser officials. But when the team sought access to information about the 30,000 or so spray missions that have been flown by U.S. planes since the war began, the data was withheld on grounds that the information was classified and none of the team members was cleared to look at it.

The information sought—namely, the time and place of the spray missions, and the type and quantity of herbicide sprayed—is of basic importance to the study. Failure to obtain the information will not completely destroy the value of the investigation, according to Meselson, but it will certainly constitute "a major disability."

Meselson was appointed last December by the AAAS board to prepare a detailed plan for studying the short- and long-term effects of military use of herbicides on the ecology and on human welfare in South Vietnam. Meselson's 1-year project—which has been allocated a budget of $80,000 by the AAAS board—was launched in response to apprehensions expressed by some AAAS members that military herbicides are seriously damaging the land and people of the war-torn country. Meselson is scheduled to submit a report on his findings to the board by the end of this year, at which point the board will consider whether it should encourage or sponsor additional studies. It is unlikely that the AAAS itself would finance an ambitious follow-up study, which could cost $1 million or more. Indeed, a recent unexpected turn

of events suggests that the National Academy of Sciences may end up conducting such a study with hefty financing from the Defense Department (see box, this page).

Just how the difficulties developed over granting the AAAS team access to key information is a matter of dispute. Pentagon officials claim Meselson was told in advance that he would not have access to classified information including the classified spray mission reports. One Pentagon source described Meselson as "naive" and "impatient" and said he ran off to Vietnam to conduct his study before he had ironed out all the arrangements. At one point Lee A. DuBridge, President Nixon's former science adviser, even told the AAAS that Meselson had either misunderstood or ignored the information given to him by the Defense Department prior to his departure for Vietnam. If Meselson could not perform a useful study without the information, DuBridge said, he would simply have to return empty-handed.

Meselson, however, states that before he left for Vietnam the Pentagon's Office of Defense Research and Engineering gave him coordinates for 20 missions that were flown in early 1970, and he expresses puzzlement as to why this recent data should have been made available to him while data from previous years—which presumably would be less valuable to the enemy—is being denied. Meselson acknowledges that he was told before he left for Southeast Asia that it might not be possible to declassify the data, but he says he did not regard the matter as closed when his team of academic scientists had to leave for Vietnam this past summer in order to have time to conduct the study before returning for the beginning of the new school year in September.

The spray mission data is apparently needed by Meselson for a variety of purposes. Meselson told *Science* that he and his colleagues collected samples of soil, water, fish, fish sauces, plants, mother's milk, human hair, and human fat while in Vietnam this summer, and he said analysis of these samples would be greatly facilitated by exact information as to whether the areas from which the samples were taken had been sprayed, and if so, how recently and how often. The scientists got some information on sprayed areas from local inhabitants, but such information was necessarily less exact than the military ledgers would provide. Meselson has also told government scientists he would like to have the spray mission data in order to employ it in a computer search for correlations between the spraying and other factors, such as crop production. Finally, Meselson told *Science* that, to design a sensible long-term study, he needs to know what areas have been sprayed, and what areas might serve as controls. "Without the data," he said, "it relegates the study to being a collection of disconnected pieces without a clear guide to the relative importance of each piece."

The spray mission data is classified "confidential"—the lowest military security classification—apparently because it is considered operational data of the sort that might prove useful to enemy intelligence. One Pentagon source told *Science* it is "normal procedure" to classify information concerning the details of military operations lest the enemy glean from it "some idea of the forces available and the logistics resupply capacity." Just who decided that the material could not be declassified for Meselson's use is not completely clear. Meselson said he was told by the U.S. Embassy in Saigon that the bottleneck was in Washington, but one Pentagon source says the bottleneck was with the operating military commands in the Pacific and Vietnam. Pentagon officials clearly think Meselson is asking for too much. "Of course these data are necessary if you're going to do a decent study," one Pentagon scientist said, "but they aren't doing the full-scale study yet. It's our feeling that the complete set of these data, all of these records, is not really required for the purposes of a planning study." This same scientist indicated that it might be possible to give Meselson selected information for areas he is interested in. "It's one thing to declassify 9 years of operational data," he said. "But it's another thing to make selected information available on areas where he collected samples."

Meselson rejects the Pentagon's contention that he is merely doing a plan-

Academy May Study Defoliation

A little-noticed provision of the military authorization bill, which emerged from a House-Senate conference committee last week, would have the government finance a large-scale scientific study by the National Academy of Sciences of the impact of defoliation in Vietnam. The legislation, which is expected to win final approval with little opposition, would require that the Secretary of Defense ask the Academy to conduct a "comprehensive study and investigation" into "the ecological and physiological effects of the defoliation program carried out by the Department of Defense in South Vietnam." The study would be financed by funds provided for the Defense Department's chemical and biological warfare (CBW) program. The Academy would be asked to submit a final report by 31 January 1972.

The provision was inserted into the bill by Senator Thomas J. McIntyre (D–N.H.), who heads the subcommittee on research and development of the Senate Armed Services Committee. McIntyre, who is considered a "dove" on the Vietnam war, has previously been instrumental in cutting the budget for CBW and in imposing stricter regulations over the shipment of CBW materials around the country. McIntyre's proposal for a study of defoliation received the endorsement of the parent Senate Armed Services Committee, which stated that "such a study is essential in light of the disturbing evidence which has been uncovered in recent years on the possible effects of herbicides."

McIntyre's assistants say that, before inserting the provision, they had gained informal assurances from Philip Handler, Academy president, that the Academy would be receptive to the idea of conducting such a study. If the Academy agrees to undertake the mission, it would presumably build on the framework erected by the 1-year AAAS study of herbicides in Vietnam, which is currently in progress. Matthew S. Meselson, the Harvard biologist who heads the AAAS study, is also a member of the Academy.—P.M.B.

"Men of Science" Forthcoming

Work is in progress on the 12th edition of *American Men of Science,* the definitive, multivolume "Who's Who" of North American scientists. The present set consists of six volumes on the physical and biological sciences and two on the social and behavioral sciences. The new edition will be published over a 3-year period, with the first volume due to appear in mid-1971. As in earlier editions, a scientist must meet one of three criteria for listing: (i) scientific training or background which is at least the equivalent of a doctoral degree, coupled with present activity in the field; (ii) "high quality" research; or (iii) attainment of a position of responsibility indicating achievement according to the first two criteria. The directory has expanded greatly since the first one-volume edition, which contained 4,000 names, was produced in 1906. The eighth edition, which came out in 1949, contained 50,000 names, and the 11th had a total of 180,700. About 165,000 physical scientists and biologists will be listed in the new edition. Anyone is eligible to submit names for inclusion in the directory. Central and South American scientists are not systematically included, but those qualified scientists whose names are sent to the editors will be listed. The price has not yet been determined but can be expected to exceed the last edition's cost of $150. Nominations should be sent to The Editors, *American Men of Science,* Jaques Cattell Press, Tempe, Arizona 85281.

—CONSTANCE HOLDEN

ning or feasibility study. "You can't make a total separation between designing a study and getting your feet wet in a pilot study," he says—but he is hopeful that an accommodation can be arranged so that the particular data he seeks can be released while other information about the herbicide missions remains classified.

Meselson was so concerned at his inability to obtain the data this summer that he spent long hours making telephone calls from Vietnam to AAAS officials and others in Washington in an effort to pry the information loose. He also raised the matter with Ambassador Bunker and claims to have gotten Bunker's agreement that there is no valid reason for the information to be withheld. But the only tangible expression of Bunker's views seems to be an ambiguous cablegram which Bunker apparently approved but which has no standing as an official communication. The cable was drafted by Meselson in Saigon and it was sent through government channels to an Agriculture Department official in Washington who was instructed to pass it on to H. Bentley Glass, board chairman of the AAAS, for whom the message was intended. The cable said that Ambassador Bunker fully supported Meselson's request for access to all spray mission data and that Bunker would so inform the military authorities in Vietnam. Ordinarily, such a cable would be handled by relatively low-level Embassy officials, but since this particular cable mentioned Bunker it was sent in for him to approve. "The Ambassador read every word and supports it," Meselson said. "He acted as concurring officer for the cable."

But just what Bunker's action means remains something of a mystery to State Department officials in Washington. One well-placed diplomatic official told *Science:* "We don't know what the hell Bunker was talking about. We can't recognize his initials on the form and we don't know whether he meant to concur in the sending of the message or in the content of the message itself. We're also puzzled as to why Bunker, who is a shrewd man and who has been in the diplomatic service a long time, should try to communicate with Washington by means of a cable sent from one private citizen [Meselson] to another [Glass]. If Bunker felt the data should be declassified, he used a curious vehicle to make that fact known." This official also pointed out that the cablegram is somewhat ambiguous since it merely says Bunker supports Meselson's request for access to the data, which could mean merely that Bunker believes Meselson should be allowed to work with the classified data (a privilege Meselson does not want) rather than that the data should be declassified. "We're trying to ascertain just what Bunker does feel about this thing," the official said. "Right now we're puzzled."

Still, whatever Bunker thinks, the decision on whether to declassify the material or not will rest with the Defense Department. Meselson intends to have the AAAS make a direct appeal for release of the information. One possibility that Meselson has discussed with government officials would be for Bentley Glass and Athelstan Spilhaus, chairman and president of AAAS, respectively, to seek an audience with David Packard, deputy secretary of defense, in an effort to work out an understanding. "The problems have mainly been due to bad timing and are certainly as much due to us as to the Defense Department," says Meselson. "We have not had a careful attempt at explaining our request that the information be made generally available."

Meselson was accompanied on the trip to Vietnam by three colleagues—Arthur H. Westing, a forestry specialist and chairman of biology at Windham College, Vermont, who had previously studied defoliation in Cambodia; John D. Constable, professor of surgery at Harvard Medical School, who had made two previous health surveys in Vietnam; and Robert E. Cook, Jr., a graduate student in ecology at Yale. The team was assisted by several Vietnamese professors from the University of Saigon and by their students. Meselson reports that the Vietnamese scientific community has become "deeply concerned" over the impact herbicides will have on future economic development and on health levels in their country. Until recently, he said, Vietnamese agricultural and forestry experts were "operating in ignorance—they didn't even know what agents were being used—their military authorities said it was none of their business." But that situation, says Meselson, is "now beginning to change." Meselson says there are many competent Vietnamese scientists who could help carry out further surveys.

While in Vietnam, Meselson's team received excellent logistics support and cooperation from the military (after some initial problems), from the Embassy, from the AID mission, and from the government of South Vietnam. They had a helicopter placed at their disposal for about 8 full days and were thus able to fly over the hardwood and mangrove forests, dodging bad weather

and areas where flak might be troublesome. They were unable to get into the hardwood forests on the ground, because battles were in progress, but they were taken into the mangrove forests to the southeast of Saigon by boat. They also flew over two areas where crop destruction missions had recently been carried out and were taken on a number of motor trips within a 100-mile radius of Saigon. Besides making visual surveys and collecting samples for later analysis, the team conducted interviews with local residents and officials, and also combed through medical and agricultural records.

Though Meselson has not yet come to any firm conclusions (most of his samples have not even been analyzed), his visual observations have already confirmed some of the findings of earlier scientific missions by Fred Tschirley, of the U.S. Department of Agriculture, and by E. W. Pfeiffer and Gordon Orians, two scientists who visited Vietnam under private auspices. Meselson says his aerial observations have confirmed earlier findings that there has been a severe bamboo invasion of some defoliated hardwood forests and his ground explorations in the denuded mangrove swamps have confirmed previous aerial observations that there has been little or no regeneration. He has also come up with some leads as to why no regeneration has occurred. Meselson's research—which has been guided, in part, by the advice of dozens of experts who attended a special conference at Woods Hole last June—seems to have gone beyond earlier efforts by collecting medical samples and by conducting in-depth interviews. Meselson says his report will probably not come to firm conclusions as to the impact of the herbicides but will "state the limits of likely effects and say that such-and-such an effort is required to find out what the actual magnitude of the effect is."

Some Pentagon officials have suggested that no worthwhile study can be carried out until the cessation of hostilities, but Meselson is convinced that studies should start right away lest valuable samples and interviews be lost through delay. "A lot of things can be done now even with the war going on," he said. "I think it's to the true self-interest of all concerned to get on with the job and stop trying to protect their own self-image."

—PHILIP M. BOFFEY

Congress: Some Progress toward Putting House in Order

On 17 September, rather to the surprise of both friends and foes of the measure, the House of Representatives passed a legislative reorganization bill (H.R. 17654) which prescribes the first major overhaul of congressional organization and procedures since 1946. The background to the House action is the usual subtle tapestry of causes and effects. But some unusual factors seem to have counted. For example, campus critics, who descended on Washington in droves last spring at the time of the Cambodia incursion to lobby, effectively quoted chapter and verse on the inefficient and often devious way Congress goes about its business. According to several observers, the knowledgeability of the campus delegations contributed to creating the atmosphere in which the measure could be passed.

The House bill now goes to the Senate for action. There are some doubts that the Senate will complete work on the bill in the time available in the waning session. But on the House side there is a feeling that the 326 to 19 final vote in the House gives the bill such momentum that a failure to act would reflect embarrassingly on the Senate. If the bill does not emerge from the Senate, the House is likely to follow the option open to it of putting the bill into effect on its side of Capitol Hill simply by passing a resolution.

To be sure, the House bill is hardly a reformer's dream incarnate. Untouched is the seniority system which, applied to committee structure of Congress, makes it a rigid gerontocracy. Power relations in the House would be essentially unaltered, and in this sense the measure is truly a reorganization bill rather then a reform bill. The bill does, however, extensively modernize the machinery of Congress and acts to dispel a good part of the secrecy and obfuscation behind which Congress has operated. Probably the most significant thing about the bill is that some of its strongest features were added during debate on the floor and that it was a bipartisan group of younger members who organized and successfully led the amendment drive.

Justifiably, press accounts of the reorganization bill have focused on its package of antisecrecy provisions, notably the requirement that "teller" votes be record votes. The House customarily resolves itself into the committee of the whole when debating legislation because of the more relaxed parliamentary rules that then prevail. In votes on amendments under these rules, House members have customarily trooped down the aisle past "tellers." Ayes and nays were counted, but no names were recorded. On the other hand, final votes on legislation are record votes.

Critics of Congress have noted that crucial decisions on the content of legislation often come on votes on amendments or other attempts to alter legislation in the committee of the whole rather than on the vote on final passage. Key votes on the ABM and on chemical and biological warfare issues, for example, were decided by the teller method. A member may vote one way on a teller vote and, in effect, the other way on final passage. Having voted to gut a bill, he may then appear to support it. Pressure groups, both liberal and conservative, which rate legislators according to their voting records, have realized that the record on final passage may be misleading, and some peace groups, for example, have put spotters in the galleries to monitor teller votes in which they have been interested.

Recording of teller votes is likely to have important effects other than simply requiring legislators to stand up and be counted. Teller votes are often decided by a relatively small portion of House membership. Chronic absenteeism from teller votes is proverbial among Democrats, particularly liberal