

in biological weapons. But, as the critics insist, it is not a long step from making vaccines or laboratory samples to producing "offensive" organisms.

The course which the British government apparently has chosen to follow is to hold to the policy of defensive CBW research to which it is committed by having subscribed to the 1925 Geneva agreement on chemical and biological warfare. At the same time the government says it will seek CBW control measures in the 18-nation Disarmament Committee which produced

the nuclear nondissemination treaty recently approved by the UN.

For the individual scientist the dilemma is an old one. Almost any scientific advance may have a destructive as well as a beneficial potential. One scientist may take the view that he bears no responsibility for how his research is applied. Another will say he is answerable for how his research is used.

In a letter to the *Observer*, E. H. S. Burhop of University College, London, expressed a corollary sentiment when he said that scientists who accept sup-

port from an establishment such as Porton "have no right to expect that the source of their research funds should be hushed up. Nor can they deny the right of their scientific colleagues to make their own judgment about the ethics of undertaking the research in each particular case." The choices for the scientist haven't changed. But what seems to be changing is that the new attention to CBW in Britain will make these choices much more public and much more widely discussed.

—JOHN WALSH

Effort Reporting: Government Drops Much-Criticized Paperwork

In response to a crescendo of complaints from the academic community, the Bureau of the Budget (BOB) has changed its reporting requirements for academics who perform government-sponsored research. The main thrust of the change is to eliminate the detailed "time-or-effort" reports previously required to justify government salary support for researchers. Under new procedures, effective 1 June, the amount of government support for faculty members will be agreed upon in advance by the granting agency and the educational institution, while support for nonfaculty researchers will be based on data from institutional payroll systems—all without the need for detailed after-the-fact reports of "time or effort" actually spent on projects.

The new procedures appear to satisfy most of the complaints which have poured from the academic community in recent years. "This is what we have been agitating for," says Lawrence K. Pettit, staff director for the American Council on Education's *ad hoc* committee on faculty time-or-effort reports. "It surprised us. We were walking around pinching ourselves to make sure it was true."

The chief reason for the change is that almost everyone concerned—the

individual researchers, the academic institutions, and the federal agencies—felt that time-or-effort reports were useless and burdensome. Says Cecil E. Goode, a BOB management analyst and chairman of an interagency committee that drafted the changes: "I've never worked on a project where there was such universal antipathy to a system."

Time-or-effort reporting was inaugurated on a government-wide basis 10 years ago when the Department of Defense (DOD) was the chief government agency supporting academic research, and the contract was the main device for rendering support. The government-wide system essentially followed DOD's philosophy of requiring strict cost-accounting by contractors. In general, the system required that periodic after-the-fact estimates of time actually spent on a project be prepared by individual researchers or their supervisors. At most universities such reports have been submitted on a monthly basis, despite recent amendments which permitted as few as three reports a year.

Complaints against the system increased sharply in recent years as more and more people were required to file reports. Not only did the growth of

government-sponsored research bring more people into the net, but new systems for "cost sharing" and "indirect charges" in government contracts required that additional personnel file time-or-effort reports. Often these personnel were not even receiving salary support from the government, but had to file reports because they represented a university's "cost sharing" contribution to a project.

In response to the rising objections, BOB organized an interagency task force on 1 December 1967 to investigate the problem and propose solutions. Besides Goode, who served as chairman, the group included Robert B. Boyden, of the National Science Foundation; Kenneth C. Potter, of the National Institutes of Health; Susumu Uyeda, of the General Accounting Office; and Eugene M. Wiseman, from DOD. The group interviewed 357 officials and faculty at 21 universities, plus some 30 government officials, then discussed its findings with additional representatives from the government and academic worlds.

The group found the academic community "virtually unanimous" in the belief that time-or-effort reporting was impossible to do in a meaningful way; burdensome, in that it took valuable professional time; and meaningless, in that faculty members generally fudged their reports to agree with previous budget estimates of the time they would spend. There was virtually no way for auditors to verify the accuracy of a signed effort report, since no supporting records were required. The system was said to engender a cynical attitude toward government.

The opposition of the universities was well known, but the task force found that most federal administrators were

also disenchanted with the system. They called it unrealistic, unnecessary, a threat to good relations with the university world, and a system "built on fiction." One government official said, "We would be unable to run Government research programs using the same requirements we place on universities."

Faced with such near universal unhappiness, the task force opted for change. As Goode told *Science*: "We concluded it was not really worth the trouble, that by and large professors are honest anyway, and that the government was getting more than its money's worth. If anything, the professor spends time on his research and slights other things because research is where he gets the stars for his crown."

The task force prepared five alternative solutions and found that representatives of the federal agencies and the academic community, with a few exceptions, generally favored the alternative that was finally adopted. The essence of this alternative is that the government will henceforth base its support on the value of a researcher's contribution to a project rather than on the time he spends on the project.

Under the new procedures, the amount of a faculty member's salary which the government will reimburse will be determined by the granting agency and the educational institution during the proposal and award process. The decision will be based on such factors as the "value of the investigator's expertise to the project, the extent of his planned participation in the project, and his ability to perform as planned in the light of his other commitments." To arrive at a fair figure, the granting

agencies will require information on the total academic year salary of the faculty members involved, the other research projects from which they are receiving salary support, and any other duties they may have, such as teaching and administration. The government salary support stipulated in the research award must not result in increasing an investigator's official salary from his institution.

The stipulated salary support will remain fixed during the life of a grant or contract "unless there is a significant change in performance." Factors which might cause a reduction in the amount include extended illness, a sabbatical leave unrelated to the research, or an increase in duties unrelated to the specific project. In these events, the educational institution is responsible for reducing the charges to the government.

Auditors will no longer review time or effort devoted to research projects, but will determine on a sample basis that an institution is not reimbursed for more than 100 percent of a faculty member's pay and that the portion of a faculty member's salary charged to the government is "reasonable" in view of his university workload and other commitments.

The new system of stipulating salaries applies only to faculty members (called "professorial staff" in the relevant budget bureau circular) and to certain other professionals who might be designated by the institutions and the agencies. Federal salary support for "non-professorial" professional staff, such as research associates and assistants, graduate students, or others performing professional work, will continue to require

after-the-fact documentation, but in a less time-consuming manner than before. Instead of the old time-or-effort reports, the documentation will be based on the institution's normal time and attendance and payroll distribution systems, provided that these systems are deemed adequate.

Superficially, at least, the new system seems to embody less strict accountability than the old. Responsible university officials must certify annually that expenditures for each research grant and contract were "for appropriate purposes and in accordance with the agreements"—but budget officials say such certification is "just a piece of paper—there's no way to go behind it." Nevertheless, as Goode told *Science*: "No accountability has been lost because there wasn't really any accountability before. The accountability lies in delivering research results, because if you don't deliver results you don't get any more funding from the review panels."

Implementation of the new system is up to the individual granting agencies. An agency could, if it wished, send out notices informing all grantees that their budgeted salary is their stipulated salary and that no further time-or-effort reports are required. Or it could phase the new system in gradually as grants and contracts come up for renewal of funding, a process which could take a year or two to complete, depending on an agency's refunding policies. In any event scientists who have been complaining of writer's cramp caused by the government paperwork explosion should soon get some respite.—PHILIP M. BOFFEY

Copyright Problems: Did Suit over Photocopying Kill Research Project?

The Committee to Investigate Copyright Problems (CICP), a small organization that has pioneered in research on the photoduplication of copyrighted materials, plans to go out of business after failing to win renewal of a government contract. The reasons for the project's demise are difficult to find in

a web of conflicting explanations. The Office of Education (OE) says the project was dropped because of budgetary stringencies. But directors of the organization believe they were denied funds because their conclusions supported a major lawsuit against the government. The lawsuit and the CICP are both

seeking to resolve problems caused by the proliferation of copying machines, a phenomenon which has undermined the royalty system on which many publishers and authors depend.

The CICP is a nonprofit, tax-exempt research organization based in Washington, D.C. Its chief claim to distinction is a report, submitted in March under a previous OE contract, which Abraham L. Kaminstein, register of copyrights at the Library of Congress, calls "the best we've seen on what's actually happening" with respect to reproduction of copyrighted materials. Kaminstein told *Science* that CICP is "probably the only organization that has