storage of poison gas byproducts in a deep well there.

In July, UN Secretary-General U Thant commented, "In my view, the development of the biological and chemical warfare materials is in a way far more serious than the development of nuclear weapons. When I say 'in a way' I have in mind the fact that the nuclear weapons are a rich man's property or a rich country's property—only the very rich and the super-rich can develop, manufacture, and maintain them. As far as biological and chemical warfare materials are concerned, it is in many ways not only the exclusive property of the rich, but they are easily accessible to the poor countries also. That is why they are far more dangerous." The question remains, however, whether the UN or any other group can secure the necessary international control before multitudes of countries face each other armed with the most lethal and the least discriminating kinds of chemical and biological weapons.

—BRYCE NELSON

# Space: Europe Makes Move toward Setting Up a Central Organization

*Bonn.* With America's growing power in space activities very much on their minds, science ministers from 12 European countries gathered here last month for a summit conference aimed at putting strength and coherence into Europe's straggling space programs. If the American space establishment is any standard, they did not accomplish very much. But since the meeting opened in a funereal atmosphere—with Britain pleading for release from some expensive commitments—and ended with agreement to work toward creation of a single European Space Authority, it was, relatively speaking, a considerable success. Thus, many meetings hence, the outcome may be a NASA-style organization encompassing the six-nation European Space Vehicle Launcher Development Organization (ELDO), the ten-nation European Space Research Organization (ESRO), and the 12-nation European Conference on Telecommunications Satellites (CETS). Whether this will actually happen, and, if it does, whether it will involve anything more than organizational shuffling, is not at all certain. For at present European's space organization is in the puttering, fragmented stage that characterized U.S. efforts prior to Sputnik. ELDO, committed to a booster rocket beset with troubles, has a 4-year budget of $626 million, which does not go very far when the cost of space vehicles, launch facilities, and tracking networks are taken into account. ESRO, which is considered to be a strong, well-run organization, has extensive facilities of its own and last year had a budget of $50 million, a figure that approaches the big leagues in space science budgets. CETS is a paper organization. Meanwhile, France and Germany are together working on what they call the Symphonie Satellite, a space broadcasting system that satisfies Germany's eagerness to be in the forefront of European technological activities and France's desire to have sure access to a technology that is so useful for political purposes.

Though fear of U.S. technological superiority spurs the Europeans to cooperate and spend, there is lacking a Sputnik-type trauma to compel them to a great deal of cooperation and spending.

Nevertheless, concern about the "technology gap" is part of modern Europeanism, and it is especially true that many influential Europeans do not live comfortably with the realization that American technology is on the way to creating satellites for direct broadcast into home receivers. Present plans call for operating satellite communication systems through an international consortium, Intelsat, in which the United States will ultimately relinquish the majority role that it now holds. But most of the hardware and all of the launching facilities are American, and while there are no complaints about the manner in which they are now being shared, who is to say what might happen later, especially in view of the many surprises that have occurred of late in American political affairs?

It was against this background of concern about the U.S. and difficulty in doing anything about it that two closely related meetings were held here. The first, starting on 11 November, brought together the ministers of the six nations (Belgium, France, Germany, Italy, the Netherlands, and the United Kingdom) that comprise ELDO, the launcher development organization, which for years has been muddling along with a booster that is supposed to be capable of launching a 170-kilogram communications satellite. The first stage of the booster is a leftover from one of the great fiascoes of British military technology, the Blue Streak missile. The issue that Britain presented at the meeting was its previously announced desire to abandon the European launcher project, rely on American-produced rockets, and concentrate resources on space applications, particularly communications. Britain, which provides 27 percent of the ELDO budget, agreed to fulfill its commitment to support the program until 1971, and it offered to sell launchers on a commercial basis at least until 1976. But Britain made it clear that it preferred to get out now. The reason, according to Anthony Wedgwood Benn, the British Minister of Technology, was that his government had had enough of white elephants and now wanted to put its investments into ventures that would bring a proper return. When the British were asked to justify their confidence in the availability of American boosters, they pointed out that the U.S. had in the past made boosters available for European scientific payloads, and that international space cooperation had long been a durable feature of American foreign policy. Britain's ELDO partners, with France and Germany taking the lead, would have none of it. The conference resolved, with Britain abstaining, to proceed with development of the launchers, though on a scale designed to keep down the costs. How much Britain would have saved by getting out is difficult to compute. Some estimates put the amount at $20 to $30 million. But there is no doubt that the British very much wanted to get out and, in fact, in return for getting out, offered to increase their support for space applications by an amount exceeding the savings that might be had from dropping the launcher project.

While holding Britain to its ELDO commitment, the conference also resolved to support the creation of a unified European space organization, and the issue thus passed over to the meeting that opened the next day, the Third European Space Conference, whose membership includes the ELDO members and six other nations—though it is the ELDO six that matter most.

The 3-day meeting, held in private, was preceded by a variety of gloomy prophecies, but when it was all over it was apparent that the desire for a European space program was strong enough to reconcile the various national interests, though perhaps only barely. Basically, what the decision came down to was that Europe will work toward the creation of a comprehensive space organization, but member nations will be free to choose the programs they want to support. In effect, this means that there will be a small group, with France and Germany at the core, working on launchers while this group and a number of other nations work on space applications and research. Those nations that do not take part in launcher development agreed that, if it turns out to cost more to produce launchers than to buy them from the U.S., they will share part of the additional cost. And with that agreement the conference ended. To implement these decisions, many more meetings will have to be held by the various councils that, in one way or another, are supposed to serve as the seedbeds of European political unity. The British emerged from the meeting convinced that, all things considered, they had fared well. One member of their delegation remarked that at least two other members of ELDO wanted to get out of the launcher business but, from motives of face-saving, were content to have the British bear the burden of making Europe turn to the U.S. for launchers. Several Europeans, however, went about openly muttering that, if Britain is really eager to join the Common Market, renouncing ELDO is a curious way to demonstrate good faith.

Whatever the science ministers may have decided, the fact is that it is extraordinarily difficult to mount a huge technological program on the sort of political base that now exists for European space activities. A few months ago Robert Maxwell, a British MP, presented a candid analysis of this problem to the European Consultative Assembly. (Maxwell, who heads Pergamon Press, dabbles in many things, such as the culinary rejuvenation of the House of Commons dining rooms and matters of science and public policy, and is currently involved in a battle for control of Britain's biggest mass-circulation weekly newspaper.) Pointing out that international cooperation requires some surrender of national sovereignty and a willingness to abandon the requirement of unanimity for action to be taken, Maxwell said, "For one thing it must be remembered that every country is paralyzed for a significant fraction of the time through having elections, or a government resignation, or an economic crisis, or a political crisis, or a language issue and so on. With organizations comprising up to a dozen countries, the number of times every one of the governments is able to take a positive step is not very great, and advanced technology cannot wait on these rare occasions, indeed it cannot wait at all."

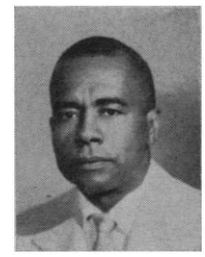
By the time the science ministers met at Bonn, Maxwell had come around to his government's position on the likelihood that U.S. boosters would be available to Europe, but in the speech before the Consultative Assembly he observed, "Experimental European application satellites will certainly be allowed to be launched by the Americans at cost reimbursement. With operational ones this is very much more doubtful."

On the separate issue of whether Europe should be content to go along with an American-manufactured international communications system, Hermann Bondi, a British mathematician who heads ESRO, strongly argued for a European program. In his report to the Bonn meeting he stated, "There can be no doubt that space applications will be of the utmost importance to the economy and indeed to the well-being of people before the next decade ends. . . . To accord to even the friendliest non-European nation a monopoly position in communications would be an almost unimaginable act of abdication."

Though Bonn is inhabited by thousands of U.S. representatives of various sorts, they were under strict orders from home to leave this European meeting to the Europeans. Nevertheless, though the Americans weren't there in person, their prowess in space permeated all the deliberations, and it appears that if anything can push Europe into an effective space program, it is the vast and still growing strength of the United States.—D. S. GREENBERG

# APPOINTMENTS

G. A. Silver



P. B. Cornely

**George A. Silver**, deputy assistant secretary, Department of Health, Education, and Welfare, to an executive associate of Urban Coalition. . . . **Paul B. Cornely**, head of the department of preventive medicine and public health at Howard University, to president-elect of the American Public Health Association. . . . **Jerome H. Holland**, president of the Hampton Institute in Virginia, will keep this position and also become chairman of Planned Parenthood–World Population. . . . **Sidney Solomon**, chairman of the department of physiology at the University of New Mexico School of Medicine, will take a sabbatical from this position and become program director for metabolic biology, physiology processes section at the National Science Foundation; also at NSF, **Richard Y. Morita**, professor of microbiology and oceanography at Oregon State University, will take a sabbatical to become program director for biochemistry, in the molecular biology section. . . . **Ronald W. Lamont-Havers**, associate director for extramural programs in the National Institute of Arthritis and Metabolic Diseases, National Institutes of Health, to associate director for extramural programs, NIH; he succeeds **John F. Sherman** who will become deputy director of NIH. . . . **George E. Dieter**, head of metallurgical engineering at Drexel Institute of Technology, to dean of the college of engineering at Drexel. . . . **S. Richardson Hill, Jr.**, dean of the Medical College of Alabama, to vice president for health affairs at the university. . . . **James H. Matthews**, former chief of clinical research in pulmonary diseases at the Veterans Administration, to assistant director of research service there; also at the Veterans Administration, **Abraham Dury**, associate chief of scientific programs for research grants in the National Institute of General Medical Sciences, NIH, to VA chief of research in basic sciences.