a technological gap is the argument that the European problem lies deeper than underdeveloped technology—that it is caused, rather, by deeply rooted structural features of European societies. In a November speech, Secretary of Commerce John T. Connor stressed the argument that "management innovation" is often more important than technical invention. "The primary problem, in many cases," Connor said, "is not technological lags, but obstacles to the application of existing technology that is readily available."

One of Connor's deputies, Alexander Trowbridge, has written that "the American chooses other points of emphasis" when discussing disparities between American and European industries. "A picture of European traditionalism dominates his image of the difficulty. He talks of slow-moving management methods that fail to convert Europe's outstanding basic research to practical production and sales exploitation of new products. . . . He criticizes the European elitist ideal in education that, in his view, slows technological progress by wasting untapped talent. He notes tendencies to fragmentation in European industry that keeps many too small to support a satisfactory R & D effort."

American officials particularly stress the need for Europeans to permit freer flow of technology and trade across national boundaries. When the Belgians called for American technological aid at the OECD meeting in January, Hornig crisply replied that the United States might have technical help to offer if the Europeans made progress toward European economic integration, movement on the "Kennedy Round" of tariff negotiations, and advances in international monetary reform. In a November speech, Vice President Humphrey said that the creation of "larger continental markets" could be "a powerful force for closing any technology gaps."

In his speech of 30 November, British Prime Minister Wilson seemed to express comparable views as he called for British participation in a European technological community of 300 million people: "America's technological dominance in so many parts of the world derives from the original opportunities presented by her own wide, dynamic markets. It derives too from the fact that her industries are sufficiently developed and massive, sufficiently free from undue fragmentation, to enable her to reap the advantages of a large scale production which modern technology demands, and will in increasing measure demand."

Later in his speech Wilson repeated the good-natured warning which he gave Americans in New York last year: "given the response of which our people are capable, be under no illusions, we shall be ready to knock the hell out of you."

Whether the British and other Europeans tool up on their own to knock the "hell" out of the Americans in technical competition, or whether they will increasingly ask for the "heaven" of a "technological Marshall plan," remains to be seen. It is almost certain, however, that the Hornig committee will provide no easy answers for solution of the technological gap, and that disparities in technical progress between nations will continue to occupy a high place on the agenda of every government for years to come.

—BRYCE NELSON

Educational TV: NSF and Arts Foundation Speak Out

Though its support of basic research and its fellowships have been useful, the National Science Foundation has been regarded, even by its officials, as largely "passive"—an agency often generous with its support but inclined to let others take the initiative. NSF has been criticized on that account, and recently there have been indications that the Foundation wants to influence national policy in science and education in a more positive fashion. These stirrings within the Foundation seemed manifest in a statement which NSF, joined by the newly established National Foundation on the Arts and the Humanities (NFAH), made last week on the need to have communications satellites put to the service of educational and cultural television broadcasting.

Although Leland J. Haworth, director of NSF, says the joint statement represented no conscious new role or departure for the Foundation, the statement had a strong activist ring seldom heard in NSF pronouncements. The commercial television networks' failure to fill the need for cultural and educational programming was briefly but forcefully described in words forthright enough to make network executives wince. The foundations, while neither proposing nor endorsing any specific plan of action, said that domestic communications satellite facilities should be established to "bring a broad and imaginative range of educational and public information programs in the arts, humanities, and sciences to the American people."

The joint NSF–NFAH statement was made in response to a Federal Communications Commission inquiry. Specifically, FCC has asked interested parties for comment on whether it can and should consider applications by nongovernmental entities such as commercial television networks to build and operate satellite systems for their own special domestic requirements. The FCC inquiry was inspired by an application last year by American Broadcasting Companies, Inc., for permission to establish such a system.

The ABC application was opposed by the Communications Satellite Corporation, which by law already has exclusive U.S. rights to operate satellites for international purposes, and which seeks to have a similar right recognized for the operation of satellites for domestic purposes. The Ford Foundation, in its statement filed with FCC on 1 August, proposed that a Broadcaster's Nonprofit Satellite Service be established to serve the commercial networks and noncommercial TV (*Science*, 26 August).

The Ford proposal was shrewdly designed to make the competing commercial interests and the FCC give high priority to the benefits noncommercial broadcasting could receive from satellite systems. Under the Ford plan, noncommercial broadcasts for cultural and

instructional purposes would be subsidized by the commerical networks. The subsidy would come from savings in transmission costs realized by the networks through use of the satellite system, which would eliminate the need for much of the present costly land-line transmission service. The Ford proposal already has put the commercial interests on their mettle. Comsat, for example, has now suggested that all users of the domestic space circuits it hopes to establish be assessed to provide a subsidy for ETV.

The appeal to FCC by NSF and the arts and humanities foundation was not the first by a government agency on behalf of noncommercial broadcasting. The Department of Health, Education, and Welfare, in a statement signed by Secretary John W. Gardner and filed with FCC in August, indicated that it felt domestic communications satellite service should not be run as a monopoly enterprise.

"We believe," HEW said, "that the versatility and competitive nature of multiple authorizations will (a) provide the greatest versatility in meeting the broad range of public needs, (b) allow uniqueness of approach where necessary; (c) allow for reaching smaller professional or public groups where significant gains can be made; and (d) permit the broadest possible continuing experimentation necessary for quality and variety of programming. . . ." The department suggested a number of ways in which satellite transmission of broadcasts could be of important benefit in the education and health fields.

The National Science Foundation and NFAH, though taking no position on whether or not networks or other nongovernmental entities should have their own satellite systems, did more than simply echo, with a pallid "me too," HEW's views on the need for better service to noncommercial broadcasting. "It is well known that commercial television does not fully satisfy the cultural and educational needs of the nation," the foundations said. "Recent surveys indicate that in many areas increasingly large numbers of the educated public look at television rarely or not at all.

"The commercial networks schedule few educational and public information programs in relation to available broadcast time, and these few are almost never shown during the evening from seven to midnight. The frequent commercials are often tasteless and always distracting. Programs with scientific, historical, and cultural content are often bland or oversimplified. Complex subjects are either not covered at all or are given such cursory or superficial treatment as to deprive them of educational value or cultural merit."

The foundations said that, while educational television sometimes has suffered from dullness and awkwardness, it has faced almost insuperable financial and technical problems. Development of a national ETV network, or even of regional networks, has been prevented by high costs, they observed. "Meantime," they added, "national distribution of noncommercial programs by video tape is inefficient, cumbersome, and extremely time-consuming —a horse and buggy operation in the midst of an electronic era. . . . Some form of direct national service by interconnection or satellite is the only hope for a higher level of educational television service."

According to the foundations, "a domestic satellite system should permit the distribution of high-quality programs in the arts, humanities, and sciences at economical rates to remote areas of the nation where educational and cultural opportunities are often minimal. The addition of new channels for non-commercial programming will create wider program choices of high-quality material. Moreover, these additional channels would facilitate live programming of artistic events and public affairs programs, thereby enhancing their interest and cultural merit."

Television via satellite would expand and deepen educational opportunities at all levels, the foundations said, and would strengthen performance and public understanding of the arts. Rapid dissemination of discoveries and new research prospects would be facilitated, and new industrial and research techniques could be demonstrated, they noted. Moreover, programs transmitted by satellite would provide a hitherto unavailable medium for mass participation in the meetings of such organizations as AAAS and the American Council of Learned Societies, the foundations said.

Haworth told *Science* he had proposed to the National Science Board that NSF file such a statement with FCC, and that the Board had agreed. At NFAH, Barnaby C. Keeney, chairman of the Endowment for the Humanities, and Roger L. Stevens, chairman of the Endowment for the Arts, were thinking of a similar action. When Haworth suggested a joint statement to FCC, they were glad to go along. In their statement the foundations avoided taking a position on the Ford plan or any other proposal, in part because they felt it would be rash and improper to pass judgment on so highly technical a question and in part because the report of the Carnegie Commission on Educational Television is still awaited.

Established last year with the endorsement of President Johnson, the commission has been making a comprehensive study of ETV. Members of the commission include James R. Killian of M.I.T. (chairman), Lee A. Dubridge of Caltech, and James B. Conant, among others. The commission's report, expected soon, will cover questions of programming, financing, organization, and technology. It may strongly influence administration policy on ETV, and will almost certainly receive FCC's careful attention.

As to whether NSF's and the arts and humanities foundation's appeal on behalf of noncommercial broadcasting will be persuasive, one can only speculate. Pointing out the failure of the commercial networks to meet educational and cultural needs was scarcely a revelation. However, the foundations' comments, representing the considered views of two agencies entrusted with promoting advance in science, the humanities, and the arts, should have some political importance. If FCC diligently seeks to further the public interest, the foundations' statement, together with HEW's, will provide moral support as the commission comes up against commercial interests more interested in profits than in bringing about a golden age of educational and cultural broadcasting.—LUTHER J. CARTER

Announcements

The **Medical Mycological Society** of the Americas, established recently in Los Angeles, invites inquiries from prospective members. The society is trying to form a central organization for people in medical mycology, to coordinate exchanges of material and information, and to carry out cooperative studies among its members. The new society plans to hold its first annual meeting in New York on 29 April, the day before the opening of the American Microbiological Society's meeting.