300 Gev: Decision To Drop Out Angers British Science Leaders

London. Britain's decision not to join Europe in building what would be the world's most powerful nuclear accelerator (*Science*, 28 June) is stirring the upper councils of science here as they have rarely been stirred before.

Particularly distressing to the scientists is the fact that the project was publicly endorsed by two of the government's highest ranking advisory bodies, the Council for Scientific Policy and the Science Research Council, and, though the Cabinet's science advisory group does not reveal its conclusions, it is understood that it too came out in support. The endorsements were strewn with warnings that the financial requirements of high-energy physics must not be permitted to deter the growth of other fields; particularly cited in this respect were oceanography, molecular biology and its relation to medicine, animal breeding, synthetic enzyme production, and computers in relation to brain studies. But at the same time it was concluded that, with projected growth rates for research and a few drastic cuts later on in existing high-energy centers, Britain could afford to take part in building and operating the machine. Nevertheless, the government said No, and, as a consequence, the statesmen of science, traditionally reticent about how they fare with the men who control the money, have taken to public protest and have even gone so far as to attempt to smoke out into public view the decision-making process that led to their rebuff.

This is small and old stuff by American standards, but it is relatively new to Britain, and one can only speculate on the effects that it may have on the close-handed, stodgy ways of government that are among the main objects of social and political unrest here and on the Continent. The scientists, who, it must be recognized, have fared relatively well, are nevertheless moving in the mainstream of protest when they contest adverse money decisions, and who can say where all this may lead?

The accelerator decision, announced in June, was to the effect that Britain would not take part with CERN, the 13-nation European high-energy research consortium, in building a 300-Gev machine that has been under design for several years as a successor to the 28-Gev CERN accelerator near Geneva. The decision was formally conveyed to the CERN council on 20 June by Brian H. Flowers, professor of physics at the University of Manchester, who is also chairman of the Science Research Council, which is the principal advisory body for providing funds for the basic physical sciences. Flowers, speaking as a government representative, said that, because of the costs involved, Britain had concluded that the expenditure could not be justified (Britain was to pay about 25 percent of the estimated construction cost of $350 million). He then went on to present a "personal" statement—and for an American parallel to this we have to think of some such extraordinary scenario as AEC chairman Glenn Seaborg publicly contesting a decision of Lyndon Johnson's.

Unpalatable Measures

Flowers revealed, first of all, that, in an effort to win Government approval for British participation, his Council had offered to commit itself to the premature closing of one or another of Britain's two major accelerators, Daresbury or Rutherford. And, he added, "we were prepared for other unpalatable measures." (Later it was revealed that this offer actually applied to both accelerators, the plan being to cut back on their support so as to maintain a fairly level volume of expenditure for high-energy physics, even as Britain's CERN contribution rose to meet construction and operating costs.)

Flowers went on to say, "It will remain the policy of British nuclear physicists to press our Government to enter the project if, as I hope, it proceeds." Then he noted that, though he spoke for himself, the 12 other members of the SRC "wished me to say here that my statement has their unanimous support in every detail."

Flower's statement was reprinted in *Nature* (6 July) to the accompaniment of supporting statements from various eminent figures of science, among them Sir Bernard Lovell, who wrote: "This decision, coming from a government which has placed so much emphasis on the future of science and technology, is quite bewildering . . . . Worst of all, it raises for the first time a most vital issue of principle as between the political body and its scientific advisers which must cause many of us to give deep thought to our future action."

Eric H. S. Burhop, professor of physics at University College, London, wrote that "the decision represents another victory for the Philistines who evaluate the significance of scientific research in terms only of short-term returns." And Professor G. R. Bishop, a physicist at the University of Glasgow, prophesied that "it could well be that future historians will single out such decisions as the markers of a new era of mental stagnation, the Dark Ages of the twentieth and twenty-first centuries." Lest anyone should misappraise what had really happened, *Nature* editorially explained that the decision reflected "a departure from reason, not simply a manifestation of incompetence."

A few weeks after this barrage of forensic overkill, one of the high advisory councils succeeded in getting the Government to spell out publicly its reasons for turning down the CERN venture. They are not such as to provide comfort to the cult of science for the sake of science. The instrument for extracting a statement from the government was the Council for Scientific Policy (CSP), the topmost science advisory body for the Department of Education and Science, of which Flowers' group—the Scientific Research Council—is a part. The CSP, which had unanimously endorsed the Research Council's recommendation to proceed with the project, invited Edward Short, head of the Department, to explain the Government's decision not to heed its scientific advisers, a matter that seems to be regarded more seriously here than in the United States. As stated in a press release based on his response, the main reason was money—"the country could not afford this new commitment."

But it wasn't simply that the projected budget for the machine was large; there was also lack of confidence that it would prove realistic, and once Britain signed up to participate—through international treaty—there was no getting out. Furthermore it was noted that "there was no short or medium term

prospect of economic benefit from so costly a scheme, and that so far there was little movement into industry of the skilled scientific engineering and technical manpower trained by participating in high energy physics." It was also observed that the offer to eventually turn off Britain's two existing accelerators to pay for CERN was not realistic. (One of those who helped promote that offer told *Science* that it certainly was not realistic. "But it was a desperation move. We made it in good faith, but what would happen when the time came to do it is something else.") Finally, the Council was told that, since the CERN machine is not likely to be located in England, if the two existing accelerators were shut down there would be no domestic research at all into high-energy physics. The account of the meeting closed with the remarkable assurance that "the decision in no way altered the understanding that the Government did not interfere in the exercise of the Research Council's own judgment on the allocation of resources allocated to them."

On the final day of the parliamentary session, when various odds and ends kept the House going till dawn, the 300-Gev decision came up briefly and several members assailed the government with material that obviously was supplied by irate members of the scientific community. Among the ammunition was, of all things, a quotation from a 1960 report of President Eisenhower's Science Advisory Committee, warning against expecting short-term results from basic research.

The House of Commons Select Committee on Science and Technology plans to hold an inquiry into the matter, though no date has yet been announced. And various scientists who are aggrieved by the decision are looking forward to an opportunity to bring it further out into the open. Whether this matters at all, at least as far as the CERN machine is concerned, is a separate question. So far, France is the only major CERN participant to express an intention to support the project; that expression was a qualified one, and it is said that, with its present economic troubles, France would not object to an opportunity for a graceful exit.

Meanwhile, of course, there is still a lot of life in CERN's present machine, and there will be a lot more when a major storage ring project, now under way, is completed. Also it is worth noting that, though publicly the high councils of science have closed ranks in behalf of the 300-Gev project, there are a few luminaries of science who scoff at the fuss. As one of them put it, "It's no disaster. The world will go on. Our problem in this country is to learn to pay our way. Basic science doesn't pay." In a country that is, properly, obsessed with its economic problems, a lot of people are talking that way, and this may, at least in part, explain why the government chose not to heed its scientists' advice on the value of high-energy physics.

—D. S. GREENBERG

National Parks: Traffic Jams Turn Attention to Roads

Many of our [national] parks are no longer a place of escape and repose, but a massive traffic jam as nerve-racking as a 5 o'clock urban rush.—SENATOR FRANK E. MOSS of Utah, in a speech on 1 August in the United States Senate.

Senator Moss's complaint is no doubt shared by thousands of tourists returning home this summer from visits to popular national parks such as Yosemite, Yellowstone, and Great Smoky, where the automobile is taking over. The steadily rising volume of park traffic not only frustrates visitors but threatens the integrity of the parks by generating demands for ever more roads, more parking areas, and more campgrounds for the huge motorized cavalcade of truck-campers and trailers.

As conservationists and environmental biologists have long observed, roads scar the landscape and disturb the ecology of the wild areas upon which they intrude, sometimes drastically, as when migration routes of elk or other large animals are blocked or when invasion routes for exotic and undesired plant and animal species are created. In the face of mounting pressure from the automobile, the National Park Service (NPS) now seems to have concluded that radical solutions must eventually be adopted.

Over the past year or so the Park Service has revised its policy on roads and transportation within the parks. Current policy is set forth in a special task force report in which three major points are emphasized.

1) Before any new park road is built there must be a finding, by professional ecologists, that it will have "minimal" effects on the habitat and movement of wildlife, on plant communities, on stream drainages, and on other natural regimes. In fact, the Park Service's chief scientist is under orders to "walk the centerline" of every new road proposed for construction. This new attitude is far different from that which prevailed even a few years ago. In 1966, for example, when the Park Service proposed a new transmountain road in Great Smoky Mountains National Park (*Science*, 1 July 1966), no study of the possible ecological consequences had been made. (Secretary of the Interior Stewart L. Udall last year rejected this road proposal after strong protests by conservation groups.)

2) An esthetically pleasing park road is one designed to "lie lightly upon the land." Heavy cuts and fills must be avoided. The goal is not to achieve technical excellence in road construction but to preserve the integrity of the landscape, respect ecological processes, and give the visitor a sense of intimacy with the countryside through which he is passing.

3) The Park Service is to study all modes of transport that hold promise of providing alternatives to new and existing roads. Moreover, it hopes to try out such alternative systems in parks (or recreation areas) where traffic congestion already is a problem or in new parks where few roads exist.

The Park Service is investigating the capabilities, costs, and possible effects on terrain and natural communities of monorails, tramways, minirails, helicopters, hydrofoils, and other systems. Plans for prototype systems are being