scientific sectors are notoriously high. Attitudes toward applied research also seem more enthusiastic in universities in the small countries.

Scientists from the small countries almost universally get part of their training or early research experience outside their own countries. Later, they seem likelier to frequent international scientific meetings and to view their own disciplines in a world rather than a national perspective.

The effect on science policy decisions of the existence of the extended scientific family in the small country is, not surprisingly, a habit of wide consultation and diffusion of responsibility. Direct policy intervention by government authorities seems to be rare in the small countries, and such intervention has not been thought necessary because scientists and engineers have been able to react readily to economic events and to adjust to new circumstances.

The tradition of a self-adjusting mechanism, however, is not an unmixed blessing. The following excerpt from the report indicates how the authors of the report see the developing challenge to the small countries.

> In practice, world industrial competition is developing on an ever wider front and, apparently, at an ever growing speed. In the old days relatively narrow specialisations allowed relatively small firms to dodge competition by means of highly specialised and technologically advanced products. With the expansion of scientific and technological efforts in different countries, these "technological niches" became harder to find and, if they were to be lastingly held, called for substantial capital investment. A similar trend is taking shape in the advanced research sector; countries with relatively modest resources find themselves more and more directly faced with the need to concentrate their efforts in certain fields. The difficulty is obviously to choose effectively.

Lumping together the five countries for the purposes of analysis inevitably means dealing summarily with the special conditions which affect each one. Belgium, for example, is grappling with the task of converting obsolete industries, and Norway, the least industrialized country of the group, has recently been blessed with an energy windfall with the discovery of major gas and oil resources off its coasts.

Then there is the new dimension of difficulty. A laissez-faire policy or "scientific liberalism"—in the 19th-century European sense of entrepreneurial freedom—has meant economic efficiency for the small countries as long as economic growth was the overriding aim. Such policies are less well suited to achieving aims outside the marketplace.

The difficulties of dealing with the new circumstances under the existing system are set forth in a chapter titled "The limits of 'laissez-faire.'" Obviously, the search for consensus among groups with differing interests holds the danger of paralysis, especially when a significant reallocation of money is contemplated.

Fundamental research presents a special problem. Basic research has been funded almost exclusively by government through the higher education budgets of the small countries, with industry providing some support for research in areas of its special interest. It is increasingly unrealistic for small countries to try to compete across the board with larger countries in basic research, particularly in fields where large expenditures on facilities and team research are required. Picking targets for fundamental research, however, will exert growing strain on the consensus politics of science in small countries.

It is understandable that the authors focused their discussion on particular issues, since the new report is the second of a projected series of three. The final installment will compare research systems examined in the first two reports with research systems in North America. And relevant background can be obtained from OECD reports on science policy in Belgium, Norway, Sweden, and Switzerland. But many readers will miss a more detailed discussion of the implications of Sweden and Switzerland's neutrality and of the European Community policies for Belgium and the Netherlands which are members and for the three other countries which are not. The research operations of multinational corporations, it is true, fall outside the ambit of national research systems, but they would appear to deserve more attention than they got.

It is hard to argue, however, with the report's major theme, that the fortunate five have been doing a lot of things right, but that they will have to prove themselves even more adaptable to keep making the right research choices and stay competitive.

—JOHN WALSH

South Africa: NASA Inches Out of a Segregated Tracking Station

It was becoming something of an annual spring ritual for Representative Charles B. Rangel, a Democrat from Harlem and a junior member of the House Committee on Science and Astronautics. Each year for the past 3 years, as the space agency budget came up for a final vote, Rangel would take to the floor with an impassioned speech and an amendment to cut out $3 million or so for NASA's space tracking station in South Africa.

The tracking station happens to be the only U.S. government–subsidized installation in the world where racial segregation prevails under law, from top management to the toilets. Rangel and his colleagues in the House black caucus saw the station as an egregious symbol of American acquiescence to apartheid, and they wanted to shut it down (*Science*, 24 March 1972). Space agency officials, on the other hand, argued along with Representative Olin Teague (D–Tex.), the House space committee chairman, that the station was technically South African, not American. And besides, they said, it was essential to the space program. "For the safety of our program we have to have a tracking station in that area," Teague declared, adding that it was "one of the most important tracking stations we have."

That apparently was argument enough for most of the House, which voted Rangel's amendment down each time by a whopping majority.

This spring though, things were slightly different. In May, Rangel rallied

more votes than ever before (104 against 294), and Senator Edward M. Kennedy (D–Mass.) introduced a companion amendment to cut off funds for the station, which he withdrew only after the Senate space committee's new chairman, Utah Democrat Frank E. Moss, promised to look into the issue in hearings this fall.

And all of this, apparently, was enough for NASA. On 10 July the space agency announced that it would begin "phasing out" the station next summer and would consider withdrawing U.S. support entirely by late 1975. Noting that NASA had closed down two similar tracking stations in the past year—at Fort Myers, Florida, and Woomera, Australia—an agency spokesman said the decision was based entirely "on our requirements" and was not a response to political pressure.

Congressional critics were inclined to disagree. "Frankly," said an aide to Senator Moss, "I think they just saw the handwriting on the wall," the message being that the station was becoming an embarrassment. Moss himself released a statement the same day declaring that "Apartheid has always been repugnant to me" and complimenting NASA for its decision to pull out.

The object of the liberals' ire is a small, dual-purpose facility tucked away in a peaceful grassland valley about 30 miles from Johannesburg. The station has never had anything to do with the manned space program, which leaves some question as to what Teague's reference to "safety" meant; but it does have an 85-foot dish antenna for track-

(Continued on page 380)

A United Front for Science?

One of the motivating convictions of Alan C. Nixon, the insurgent president of the 107,000-member American Chemical Society (ACS), is that the bread-and-butter concerns of the nation's bench scientists have not been given coherent or effective voice in Washington. A former Shell Oil chemist from Berkeley with an engaging, downhome demeanor, Nixon led a populist uprising in the chemical society 2 years ago that reshaped the society's board of directors and thrust him into its presidency. Ever since, he has tried determinedly to transform the tradition-bound ACS into a more vigorous spokesman on such issues as scientists' unemployment and federal research cutbacks.

Success has been more elusive than Nixon might have hoped—an ambitious "professional enhancement program" in the ACS, for example, has had money-raising problems. Undaunted though, Alan Nixon is branching out. He has organized a Committee of Scientific Society Presidents, whose purpose, according to an ACS press release dated 3 July, will be nothing less than "to work for the development of a constructive national science policy . . . [and to] make known the views of the scientific community on public issues involving science and technology."

Thirteen societies, ranging from the American Institute of Biological Scientists to the Federation of American Scientists (FAS), were represented at an organizational meeting in Washington on 15 June. And Nixon says that several others, including the AAAS, have expressed an interest in participating. The total membership of societies initially represented is about 200,000, including most of the country's chemists, biologists, physicists, and mathematicians.*

In a telephone conversation, Nixon told *Science* that his conception of the committee is less formal and pretentious than its name might imply. He said he views it as a kind of informal talking club (without staff or budget) in which the leaders of science organizations—who rarely have a chance to meet en masse—can discuss problems of common interest. Hopefully, he said, the committee will be able to reach a consensus on major science policy issues, and, in so doing, will come to represent something of a united front for the scientific community.

"The National Academy of Sciences and the AAAS do some things in this area," he acknowledged, emphasizing that "this is not an attempt to set up a counter-organization. We want to supplement the academy and the AAAS, to provide more broadly based representation of science than the academy does."

As the committee's main goals, Nixon said the societies' presidents would seek "more interaction with government" as well as closer relations with the employers of scientists, especially in industries where layoffs have been heavy. Ideally, Nixon said, the committee might eventually link up with a similar club that already exists among the engineering societies.

According to the ACS release, the committee's next meeting, on 6 October, will "examine the whole question of national science policy" and wrestle with the pros and cons of a federal Department of Science and Technology, a hoary old perennial that has never quite bloomed in Congress.

An agenda like this might lead a cynic to wonder how long the Committee of Scientific Society Presidents will survive in Washington's political wilderness. In the FAS, however, the committee does have an experienced pathfinder; Jeremy Stone, the federation's executive director, sees the relationship as mutually advantageous. "We can help show them how to make contacts, how the system works in Washington," Stone says. "And they can help us by giving us new contact with the scientific community, and relaying its concerns."

One of the FAS's current points of concern, and one which the committee will probably take up in October, is the plight of Jewish and dissident scientists in the Soviet Union; for what it is worth, the committee will probably protest alleged instances of maltreatment.

In the long run, if the committee of presidents falls flat, nothing much will be lost. And, as Stone observes, with science evicted from the White House, there is much to be gained. "The time is ripe, and the need is there, for scientific societies to speak up," he says. "*Somebody* has to do this."—R.G.

* Besides the ACS, the FAS, and the AIBS, other organizations represented on the committee are the American Institute of Chemists, American Mathematical Society, American Oil Chemists' Society, American Physical Society, American Society of Microbiology, Federation of American Societies for Experimental Biology, National Science Teachers Association, Optical Society of America, Society for Applied Spectroscopy, and the American Association of Clinical Chemists.

(Continued from page 332)

ing deep-space probes like the Jupiter-bound Pioneer spacecraft. Smaller antennas are used at the station for tracking unmanned earth satellites. The space agency said the deep-space part of the station will be closed next year and the rest of it, possibly, by late the following year. No decision has been made on whether the South African government's Council of Scientific and Industrial Research (CSIR), which runs the station under subcontract to NASA, would keep the facility open by itself after 1975.

In all, the station employs about 280 persons, including 60 blacks; none are American. Information gathered by NASA at the request of Representative Charles C. Diggs (D–Mich.), another member of the black caucus, shows that, whereas blacks hold about 25 percent of the jobs at the station, they receive only about 5 percent of the wages paid by NASA through the CSIR. After a visit last year, Diggs reported that black employees are barred not only from the station cafeteria but, more importantly, from most of the technical and all of the supervisory jobs, as well as from technical training programs.

For his part, Rangel charged in May that "gross disparities" exist between fringe benefits given to white and black employees, such as sick leave, vacation leave, and medical benefits. Rangel also said the highest-paid black employee, "a skilled laboratory assistant," earns $2005 a year, barely more than the lowest-paid white employee, a "raw trainee" who draws $1930 a year.

Under prodding from Diggs and the others, NASA did extract promises last year from the CSIR to improve wages and fringe benefits and to build a primary school for the children of black employees, all of whom live on the 4000-acre site.

But the station's critics in Congress regarded these improvements as merely cosmetic, and South Africa seemed not to think the station important enough to its own interests to justify making exceptions to the rules of apartheid. "The system is so unyielding," said an aide to Rangel, "that if the U.S. had forced the point, South Africa would have just kicked the station out."

What about the 60 blacks who stand to lose their jobs, menial as they may be? "Human problems have to be considered," said the aide. "But Mr. Rangel felt the station was a moral symbol of U.S. compliance with apartheid, and it had to go."—ROBERT GILLETTE