Science in South Africa: The Effects of Apartheid

While the example of Soviet success has somewhat dented the American conviction that democracy and science are divinely interrelated, one of the more provocative questions about science still remains: To what extent does it need freedom, and what kind of freedom does it need, in order to flourish? More data for the debate can be found in a recent report from UNESCO surveying the state of science, culture, education, and freedom of information in one of the most desperate of contemporary despotisms, South Africa.* Science is not an object of governmental hostility in South Africa. On the contrary, the government subsidizes science and depends upon it for its roles in the development of technical manpower, in defense research, and in industrial expansion. But the government values the ideology and practice of apartheid more, and in the course of suppressing 11½ million blacks, the 3 million whites, including the scientific elite, have hurt themselves as well.

South Africa began implementing its apartheid policy in 1948, with the government gradually forcing more and more sectors of the society to comply with its discriminatory rules. In 1962, according to the UNESCO report, the government got around to science, and began pressuring scientific societies to segregate their membership. Fourteen societies which receive government subsidies were told, in letters from the Minister of Education, that "it has been decided with reference to scientific and professional societies, no mixed membership is allowed and where this exists a separation must be effected immediately. . . . With reference to separate scientific and professional societies," the letter continued, "the same procedure should be followed as has been announced for sport societies some time ago. According to this, non-white societies should be combined by way of affiliation in national societies which can appoint one or two representatives to attend periodically certain executive meetings of the national societies for whites. In this way channels can be created not only for the interchange of ideas, but also to pass on to non-white scientists the knowledge which has crystallized out in congresses and conferences of white scientists." The societies were warned that if they continued to retain nonwhite members, economic reprisals would follow.

UNESCO reports that the minister's letter "caused a good deal of criticism and ridicule" and was largely ignored. In 1964 the government again raised the issue. At that time seven societies decided not to go along with the government, one decided not to reapply for government support, and six adopted a wait-and-see position. The reason for the ridicule was not that rampant liberalism made the idea of compliance seem preposterous but that the society is so soaked through with the effects of discrimination in education that the nonwhite membership of scientific societies is infinitesimal. In response to UNESCO's questions, the South African Institute of Physics reported that three of its members were nonwhite—two Africans and one Asian. The Dental Association said it had eight nonwhite members—all Asian—but that it would segregate at some future date when the numbers of qualified nonwhites justified their forming a separate organization. And the South African Psychological Association, which told UNESCO that in 1961 psychologists had split on the question of admitting nonwhites, with those who favored exclusion seceding and forming a separate group, said it had six nonwhite members—two Africans and four Asians. The Genetics Society and the Royal Society of South Africa said that no nonwhites had ever applied for membership, and the Genetics Society pointed out that "the university facilities usually used for meetings and congresses would presumably not be made available to use for mixed racial gatherings."

The international relations of science are also affected by apartheid. UNESCO reports that South Africa has either resigned from, or been excluded from, a number of international organizations —the Commission for Technical Cooperation in Africa South of the Sahara (1962), the Food and Agriculture Organization (FAO) (1963), the Council for Science in Africa (1963), and the Economic Commission for Africa (1963). An attempt to expel it from the World Health Organization has so far been unsuccessful. South Africa withdrew from UNESCO itself in 1955, in protest against UNESCO publications on racial problems.

The effects of nonparticipation in these bodies are difficult to calculate. UNESCO suggests that isolation works more by limiting South Africa's contributions to international developments than by reducing the country's ability to benefit from the advances of others. In 1963, for example, the Minister of Foreign Affairs announced that the Onderstepoort Veterinary Research Institute would no longer serve the FAO as a world reference center for certain diseases. In addition, UNESCO says that South Africa's absence from the Council for Science in Africa "has meant that important contributions on the treatment of animal diseases, research into low-cost housing, road technology, surveying and photogrammetry, the application of precise surveying methods to mining, psychometrics, nutrition, and telecommunications are not available to that body."

But there have been losses to South Africa too, including losses of one indispensable asset—men. In 1961, according to UNESCO, 25 faculty members resigned from the University of Cape Town and 35 resigned from the University of Natal. While there seem to be few hard numbers, the UNESCO report says that emigration is continuing on a considerable scale, and that emigrés include people who played "a senior part in the intellectual life of the country."

The emigration rate is not attributed wholly to apartheid. The report points out that university salaries are low and that research facilities are not always equal in quality to those available else-

* The report, entitled "The Effects of Apartheid on Education, Science, Culture and Information," was prepared by the UNESCO Secretariat for the United Nations Special Committee on Apartheid. It is a working document, and copies are not available to the public at this time.

where, so that "even in the absence of an Apartheid policy a turnover of staff could be expected." But UNESCO notes that losses have occurred chiefly in the English universities, and it believes that apartheid has played a major role. Further, the report says, the "government appears indifferent to the loss of academics," and has in some cases even encouraged emigration. The report cites a number of cases where leading academics and promising students, upon requesting passports for foreign study or travel, have been given one-way exit visas which preclude their returning to South Africa.

While the rate of immigration of professional personnel is still higher than the rate of emigration, apartheid has also brought with it difficulties in recruiting, particularly from England. In 1965 more than 500 staff members of British universities signed a pledge not to accept academic posts in South African universities which discriminate —a move that, according to UNESCO, caused "discouragement in liberal academic circles in South Africa." In recruitment, as in the case of emigration, apartheid—and the prevailing social and political climate—is only one of many factors, but the net effect is an increase in the academic isolation of South Africans. The report notes that this isolation is felt not only in the lessened numbers of first-rate academicians moving to South Africa permanently but also in the lessened numbers of foreign visitors. At the same time, funds for overseas fellowships have evidently diminished, and the withdrawal of South Africa from the British Commonwealth has meant that students no longer qualify for a variety of scholarships and fellowships formerly available. UNESCO quotes the Secretary of the Royal Society of South Africa, who said recently, "Within my own very limited experience the main effect of apartheid on scientific institutions has been a decrease in the numbers of overseas visitors who want to come and work here (very noticeable since 1960). This decreased contact means that it is more difficult to place advanced students in suitable overseas institutions, though, as yet, no real hardship in this direction has been felt."

Rockets and Gases

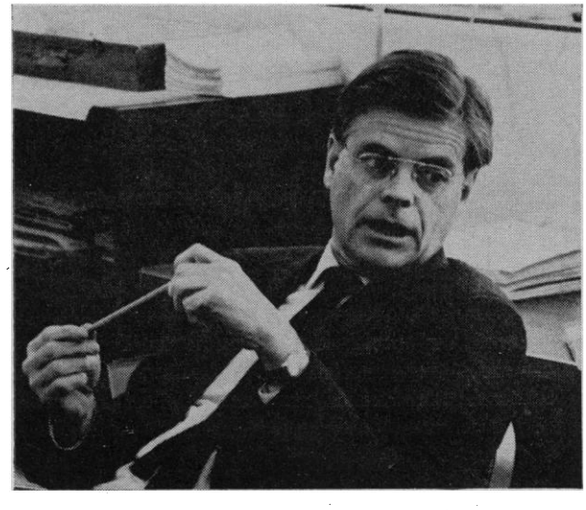
In addition to its effect on external scientific relations, apartheid has evidently had an impact on science as practiced within South Africa. According to the UNESCO report, since 1960 South Africa has felt itself in a hostile environment and has been increasing its defense budget substantially. This increase was accompanied by the establishment in 1963, under the government's Council for Scientific and Industrial Research, of a National Institute for Defense Research. The institute has sections dealing with physics, chemistry, and electronics. Two of its projects, according to UNESCO, are development of a rocket-propelled ground-to-air missile and the further development of poison gases. UNESCO notes that, "though exact figures are not available as regards that part of scientific research in South Africa which has recently been directed toward Defense, it remains clear that the effect of the Apartheid policy is to divert a certain proportion of the total available resources for scientific research from research geared towards pacific and civilian aims."

UNESCO says that apartheid has also affected the substance of social science research by, among other things, placing insurmountable barriers between white researchers and African subjects, and by encouraging researchers to stay within noncontroversial areas. According to the report, researchers have provided "a mass of ethnographical studies of 'tribal' " systems in contrast with the relative dearth of studies of the dynamics of social-economic change arising through industrialization-urbanization. . . . Certain lines of research," the report continues, "are made virtually impossible by the particular socio-political environment to be found there, e.g. an investigation into cross-racial sexual relations, or an investigation (especially by a European) of non-European political attitudes." The report points out that official book censorship has also affected the social sciences. Among banned works are Dollard's *Caste and Class in a Southern Town*, Richmond's *The Colour Problem*, and Kuper's *Passive Resistance in South Africa*. Many of the pamphlets in the UNESCO series *The Race Question in Modern Science* are also banned.

In its final remarks on science and apartheid, UNESCO says, "We live in an age of science and technology. If it is not also to be an age of the technocrat divorced from the rest of the population, there must be access to scientific knowledge for all people."

Universities Research Association (URA) last week took another step toward becoming the manager of the AEC's proposed 200-Bev accelerator (*Science*, 24 February 1967) when it announced that one of the leading frontiersmen in accelerator building, Robert R. Wilson, of Cornell, is its candidate for director of the gigantic machine.

Wilson, who began his career under Ernest O. Lawrence at Berkeley, headed the Nuclear Research Division at Los Alamos during World War II, then engaged in cyclotron design research at Harvard before becoming director of Cornell's Laboratory of Nuclear Studies in 1947. Under his direction, the Laboratory had built a series of electron synchrotrons, culminating in a 10-Bev machine that is now virtually completed.



"Any discusion of the effect of Apartheid on science," the report continues, "therefore must be concerned not only with the training of a scientific elite—although this is important in any industrialized society—but also with the ways used to ensure that the non-elite understands, to some extent, the type of development which is going on around him. This type of information is given both at school and by the mass media. Here the effect of Apartheid on science is clear.

"With restricted science facilities in non-White schools, restricted mass media as well as the restrictions placed on non-White participation in scientific creation, the non-White population is almost completely deprived from taking part in the scientific developments of today's world."—ELINOR LANGER

Marine Sciences Council Reports Priorities of Executive Branch

With a light tap of the ceremonial bottle, President Johnson recently launched the Administration's newly constructed marine sciences program. The President may have christened a relatively small craft but he seemed to offer the hope of larger vessels in the future as he announced that the nation would encounter the ocean environment "with the same conviction and pioneering spirit that propelled ships from the Old to the New World."

The most pleased spectators at the event were the chief architects—Vice President Hubert H. Humphrey, chairman of the Marine Sciences Council, and Edward Wenk, Jr., the council's executive secretary. The symbolic launching came in the form of the first report of the council, an interagency coordinating group created last summer by a Congress impatient of Executive Branch fragmentation and delay in the development of U.S. oceanography. The Congress also established a companion Commission on Marine Science, Engineering, and Resources to provide advice on program and organization.

The council's report, entitled *Marine Science Affairs—A Year of Transition*, was sent by Humphrey* to the President who then relayed it to Congress. Although the council outlines several specific marine programs, the report's main importance may well be that such a document could be written at all. According to Wenk, the report is the first major policy statement to receive the approval of all the sections of the national government concerned with marine science; 24 bureaus in 11 federal departments have responsibilities in this area.

It is well known that governmental agencies are jealous protectors and promoters of their own programs; the marine sciences area is no exception. Despite this bureaucratic possessiveness, the Marine Sciences Council was able to agree on a report which established governmental priorities and described activities by purpose rather than one which listed specific programs agency by agency. (By contrast, the annual report of the Space Council, the other intergovernmental group which Humphrey heads, focuses on activities of individual departments.)

Marine Council's Budget Efforts

In the time since the council was created last summer, the group has spent much of its energy protecting and expanding the funds available for federal programs in the marine sciences. The budget for oceanographic activities proposed for fiscal year 1968 is $462 million, $53 million more than last year. Most of this increase is in areas marked for priority spending by Humphrey and the Marine Sciences Council. In an interview, Wenk said that he looked on this increase with satisfaction, in light of the council's late entry into the budget-making process last fall in a time of a "no new starts" atmosphere caused by the heavy spending for the Vietnam war. The report notes that the nation as a whole allots only about 3 percent of its technical spending to marine science activities. Council officials, however, indicate that they do not anticipate any "crash" oceanographic program in coming years. "We're not in a race to see how much money we can spend," Humphrey explained at a press conference.

The whale's share of the 1968 federal marine sciences budget, $258.7 million, is scheduled for the U.S. Navy. Despite the fiscal importance given to military activity, the council's report is civilian in tone. (On the other hand, "Effective Use of the Sea," last year's PSAC report, gave greater stress to the military significance of the oceans.) The report of the Marine Sciences Council gave proportionately little space to an account of military uses of the seas and noted that "in fiscal 1968, civilian activities will increase more rapidly than defense activities, reflecting the increasing emphasis on utilizing marine sciences to meet industrial, economic, and social goals."

By implication, the report even seems to chastise the Navy for inadequate development of deep-ocean search and retrieval capability, one of the areas which the council concluded was deserving of special emphasis. The report states that the 1963 *Thresher* catastrophe demonstrated that "this nation had virtually no capability" in search and retrieval in water more than 400 feet deep.

The council noted that, when a nuclear weapon was lost in 2850 feet of ocean off the Spanish coast in 1966, the nation demonstrated that it had acquired "some capability, embryonic

*The other members of the council are the heads of departments and agencies concerned with marine sciences affairs: Navy, Interior, Commerce, Transportation, HEW, State, Atomic Energy Commission, and National Science Foundation. The leaders of NASA, the Smithsonian, AID, the Budget Bureau, the Council of Economic Advisers, and the Office of Science and Technology also attended meetings of the council as observers. The report can be obtained for $.60 from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.