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Frank Press, the noted North American geophysicist who acts as science and technology adviser to President Carter, visited Venezuela on a special mission from 7 to 10 October 1979. After Venezuela, his mission would take him to Brazil and Peru. Press was accompanied by a selected group of 30 well-known scientists and technologists, among whom were Benjamin Huberman, associate director of the President's Science and Technology Office; Richard D. Atkinson, director of the National Science Foundation; Robert Frosch, administrator of the National Aeronautics and Space Administration; Peter Bell, at the Department of Health, Education, and Welfare; Ray Chamberlain, president of Colorado State University; and Alexander Heard, chancellor of Vanderbilt University.

During their stay, members of the North American science and technology committee visited Luis Herrera Campíns, president of the republic, and several ministers, as well as a number of Venezuelan institutions, such as the Venezuelan Technological Petroleum Institute, the National Dermatological Center, the steel plant at Puerto Ordaz, and the Instituto Venezolano de Investiga-

ciones Científicas. It was regretted by many that the Venezuelan Association for the Advancement of Science, founded 29 years ago on British and American models and representing the scientific community, was not paid a visit.

Attitudes Toward North American Influence

The importance of Press's visit is enhanced by the fact that over the last 25 years or so there has been a significant growth of Venezuelan research—in science and, to a lesser extent, technology—so that the country is today better able to profit from foreign help in science and technology. In addition, the present President, Luis Herrera Campíns, of the Social Christian Party, appointed in March a state minister for science and technology, Raimundo Villegas, an active biophysicist and recognized member of the scientific community who was trained at Harvard under A. K. Solomon. Finally, Venezuela's 6th National Plan, which for the first time includes science and technology as a separate sector, is being prepared un-

der the supervision of Villegas and the National Research Council (CONICIT).

On the other hand, although nearly everyone in Venezuela recognizes the global worth of North American science and technology and their impact on economic, social, and cultural aspects of U.S. life, there are grave doubts—at least among many in the academic community—about both the motivation and the efficiency of U.S. help. Previous efforts, such as President Kennedy's Alliance for Progress and, on a lesser scale, President Eisenhower's Atoms for Peace, are judged to have had little effect on the country's science and technology, much less on its social and human development. The influence of multinational corporations on the development of endogenous science (and especially, technology) is thought to have been negative. For example, the oil companies obviously did bring economic benefits, from the 1920's on, but they did little to encourage local research, preferring to perform it in their home environment. Oil is by far Venezuela's chief natural resource (providing around 92 percent of its foreign income). With a few exceptions, such as Universidad del Zulia in Maracaibo, near the oil fields, there was little research on oil by Venezuelans until 1972, when the petroleum and chemistry group of Instituto Venezolano de Investigaciones Científicas was organized. The Venezuelan Technological Petroleum Institute began functioning only in July 1976, 1 year after the industry had been nationalized on 29 August 1975. It is not implied, of course, that the oil companies

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forcibly prevented the setting up of oil research programs; rather, through their implicit policies, they inhibited motivation and favored a dependent attitude.

Science and technology in the region have existed in the context of socio-economic and cultural dependence, first on Spain, then in the 19th century on Britain's "informal empire," and now on the United States, and therefore they have failed to flourish in an autonomous way. All these concepts, very briefly stated here, may sound to a North American ear like so much Third World rhetoric, but they deeply concern many people in our region, and they have been documented by many Latin American scholars, especially those of the *dependentista* school. American interventions in the past, especially in the Caribbean area, starting in Panama at the beginning of the century and later in Nicaragua, Guatemala, Cuba, Santo Domingo, and Chile, have left widespread sentiments of mistrust, although these have been somewhat allayed by President Carter's handling of the Panama Canal and his low-key diplomacy during the Nicaraguan revolution.

It would be inaccurate to say that Press and his committee were received with a shower of criticism from either the public or the academic community. A few members of the academic community voiced some of the ideas that are outlined above. One extreme view was that of Professor Rodolfo Quintero, a well-known university sociologist and anthropologist and a member of the Venezuelan Communist Party, who criticized the government for planning a science and technology office headed by North Americans and placed on the United States full responsibility for the lack of development of research in the region. The first part of his statement was vigorously denied by the science and technology minister, and there is no evidence on which to base it.

Interview with Frank Press

We were able to interview Press and put some questions to him, and some of these remarks may be of general interest.

Q: What is the main objective of your present visit to Venezuela?

A: Science and technology are very important for both of our countries. Venezuela and the United States are at different stages of development: we are an advanced industrial nation, and we use science and technology to make sure our industry is innovative and continues to

prosper and to better our standard of living; furthermore, we have problems in our country that science can address. In health, there is cancer research. Although agriculture is already very advanced, it can be bettered; for example, we want to use some of the newer techniques of genetic engineering and recombinant DNA to better the production of crops; we have research in natural resources and in many other areas, but, at the end, there is science as a cultural, important, national endeavor in its own right. My job is to make sure that American science remains healthy; we look on budgetary matters, deal with the problems of scientists and in general make sure that the laboratories remain as a national priority. Venezuela is another matter: it is a country that wants to improve agriculture, food production, and health. Venezuela wants to develop a certain amount of industrial technological capacity, and, as a proud nation, wants to become part of the developed world. Now, there are many areas in which the United States and Venezuela can cooperate, because working together they can do better than alone. During my visit we are exploring some areas. In the past we have followed our own course, and by pooling human and fiscal resources these factors of mutual interest can be better tackled. Immunology, for example, is a field where cooperation between our two countries would be fruitful.

I mentioned our great interest in agricultural productivity, which is shared by you. In the area of energy we have enormous heavy oil resources, and so do you; they require technological development to produce and refine them: we can work together in this area. You have underexploited geothermal resources, so have we. You are interested in solar energy, so are we. If it is possible to work together, that makes good sense, and we should do that.

Q: From your point of view, what are the main problems faced by Latin America, and particularly Venezuela, in their development of a scientific-technological infrastructure?

A: I don't think the case has to be made to Latin American nations that the foundation for development is not technology only, although it is important. The main problem you face is to develop human resources, to train people at all levels, technicians, scientists, etc. You have to provide the kind of institutions that understand and are willing to tackle this problem. A country like Venezuela, for example, is not going to want to compete at world level in every single area of

science. You should be interested in those areas that are important for your own development. You want to be independent and need to develop science that helps do that.

Q: Do you have specific projects related to our scientific and technological development?

A: We should recognize that there are many models. We have our model, you have your model. We should examine the ways to fulfill our aspirations. In the United States, we have had remarkable success based on our technology. So perhaps we should examine the way it is in our country. First of all there is a basic recognition that the universities are the primary reservoir of basic research for the United States; not only do they educate our scientists but they do most of the basic research. In our country we made the decision many years ago that to combine research and graduate education was important. Then, we try to keep the support of research in the universities outside of the realm of politics. The National Science Foundation and the National Institutes of Health are designed to try to provide for the best investigators to solve our problems.

Q: What is your opinion of E. B. Skolnikoff's remark indicating that foreign aid poses a real problem of "skewing the scientific development of other nations, especially the less advanced countries, in the direction of America's scientific interests instead of their own" (1) and of H. B. Chenery's remark, "The main objective of foreign aid . . . is to produce a political and economic environment in which the U.S. may pursue more favorably its own social objectives" (2)?

A: Regarding Skolnikoff's question: Dr. Skolnikoff is an American leading analyst of science policy, he is a senior adviser to my office and spends 1 or 2 days a week there. About the quotation (I'm not sure it is correct), the notion is that we are trying to recreate other countries' institutions in the image of America, and anybody who is naive enough to propose such an approach to a country like Venezuela should be criticized. I would like to tell you that, in my own country, we are not that naive in thinking that we can export the way we do things to another country. That's really not the way to develop our relationship. The correct way is based on an acknowledgement of mutual benefits to be derived from mutual agreements; it is also based on a request to us from developing countries. I just don't think that we are trying to "skew" anybody's development. It may be that Skolnikoff said it

many years ago in another situation. I assure you that nobody in our country today in a senior political post has that attitude.

With respect to our foreign assistance program, which is the question in the second quotation. Of course, it is a more difficult thing to respond to. We would like to create a world where each nation pursues its own social objectives, one that will lead to a reduction of poverty, of starvation, a world with progress. Such a world is of interest to everybody, ourselves and all others, and our view is that if science and technology can in fact help create such a world, then I say yes to the question. But if the quotation implies that the present U.S. government wishes to direct the course of political and economic development of other countries in its own political interests and interfere in internal affairs, I just don't think I agree with that.

Q: In your opinion, do you feel that politics have been playing an increasing role in science in your own country?

A: Let us divide the question in two. When it comes to the support of basic research, say in astronomy, mathematics, high energy physics, molecular biology, we try to keep it outside of politics.

Q: What about cancer research?

A: In the area of cancer research, politics enter in the following way. A political decision on the part of the government was made to emphasize the search for a cure for cancer. The decision was made 10 years ago. As a result, we now spend about a billion a year on cancer research. That decision was political in the sense of establishing a priority in our research budget. We could have put the funds in oceanography, space, in computers, but the decision was made for cancer research. Now, with respect to research, anytime we spend that much money it is a political decision to carry it forward. Recognizing that, we nevertheless try to preserve as best we can the balance and stability of the science establishment. To do so is my role as presidential adviser.

Q: What do you feel this role should be?

A: Having a high position in the White House requires political sensitivity. You are there in order to help the President; I help in many ways. Many decisions require technological evaluation. I help in putting forward the best options, which include interacting with many people and giving my own impressions. I try to make sure the President's decisions are implemented. In that sense, I have a duty as a technical adviser, and I think it is quite different from politics in-

terfering or influencing the decisions regarding my duties.

Q: What should be the role of private associations for science?

A: We are dependent in large part on these associations. We have their recommendations. We try to use them to evaluate and disseminate the results of research. In addition to that, the expertise present in the membership is a very important resource. I can think of many associations from which we ask advice on how science and technology can best be put to use to solve specific problems.

Q: How many scientists have been elected to the U.S. Congress? What has been their role? By which mechanisms does the U.S. Congress receive scientific advice?

A: We have several sources within Congress for technical advice. We have several congressmen with technical expertise, and we must have around 200 congressional staff members with technical training. We also have an Office for Technology Assessment which has a large staff. Congress has many resources; it is divided up into a number of committees—education, national defense, etc. The House Committee on Science and Technology has many subcommittees—international science, basic research, energy, and so on. The Senate has a similar structure. Of course, the committees are made up of elected congressmen.

Q: What is the relation between Congress and government and American industry abroad? In other words, the relation between science and diplomacy? Could American industry abroad help in the process of endogenization of science?

A: There are relationships between the government and industry; for example, we export or import manufactures. Government mechanisms may regulate that. For certain countries we do not export types of technologies that can be diverted to military use. In that sense, government interacts in commercial decisions about what can be sold and what cannot. There are countries with relatively free markets where American companies can go and make their own arrangements, and countries which have restrictions and regulations—for example, Japan. Our country encourages a relatively free market; in that sense we try not to intervene in the politics of American companies abroad. However, those companies are more and more finding that to serve the interests of the host country is also in their own interest so they are more and more willing to view their role in a larger social context.

American policy is not to interfere in the activities of multinational corporations except to ask that they obey the laws of the countries they operate in.

Q: What will your visit achieve?

A: My hope is that between our government and yours we can develop a relationship at many levels. Between scientific institutions in your country and in mine, and in certain well-defined areas. There are certain fields where there is benefit for only one of the parties. If you request collaboration in an area where we are primarily involved in helping you, you should contribute heavily to the costs. In areas where both parts benefit we should share the costs. I am sure we can find areas of common interest where we can work together. I should say that I feel that that part of my mission is going to be fulfilled.

Possible U.S.-Venezuela Agreement

Before Press's visit, there had been no public information about a possible U.S.-Venezuela agreement on science and technology. We checked with Minister Villegas, who told us that there had actually been bilateral conversations on the subject "for about 3 years," beginning with the previous administration, and that a text was now ready for signature. This is an example of poor communication with the public on matters dealing with science and technology policy.

The "umbrella agreement," however, was not signed on this occasion. A "top official" in Miraflores (the presidential office) stated (3): "Frank Press was ready, but President Herrera is of the opinion that the signing of agreements must not be mixed up with the recent Caribbean events [referring to President Carter's deployment of troops in response to what the U.S. President saw as a Soviet threat]. He does not wish to mix scientific and technological questions with politics." Minister Villegas, who also checked with Foreign Minister Zambrano Velasco, told us that the press report had not been denied by the government, but that President Herrera left the door open for signing the agreement in the future. President Herrera's decision is a way, in fact, of mixing science and politics (4).

References and Notes

1. E. B. Skolnikoff, *Science, Technology and American Foreign Policy* (MIT Press, Cambridge, Mass., 1967).
2. H. B. Chenery, quoted by E. B. Skolnikoff in (1), p. 185.
3. *El Nacional*, 10 October 1979.
4. After this article was in press, the umbrella agreement was finally signed on 11 January 1980.