guest comment

In search of progress in a coastal rainforest

Irving A. Lerch

Technical assistance is rarely given in response to such clear-cut imperatives as catastrophe or famine. Often it derives from a confluence of accidents. Agencies responsible for administering aid programs are part of a political system which manufactures missions haphazardly, regardless of the elegance of governing policy. A machine is set in motion and fueled just enough to sustain the flow of bureaucratic momentum. Individual projects emerge as a chain of incoherent fragments colored by the cultural biases of technocrats either from or trained in the industrialized nations, harboring perceptions often insensitive to conditions in the less developed countries. Thus, the evocative canvas of reality is washed by a mix of pigments; the antagonistic perceptions and self-image of givers and recipients.

From the beginning of 1973 until 1976 I was a member of the scientific staff of the International Atomic Energy Agency in Vienna, a UN affiliate responsible for safeguarding the nuclear non-proliferation treaty and seeking, according to its statute "... to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world." I shared the fate of most scientists assigned to the Agency, seconded by member governments for fixed-term appointments, on leave from faculties or government laboratories and assigned the odd-jobs of the international scientific bureaucracy: evaluating and administering technical contracts and grants, organizing meetings, preparing publications, and developing technical assistance missions in response to requests from the member states. In 1975, I decided to serve as both administrator and expert for a minor assistance project in West Africa—in Ghana—which featured the loan of californium-252 sources to educational institutions.

The technical assistance mission of the IAEA in nuclear technology stands on a very serious premise: that non-

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nuclear states will be dissuaded from seeking nuclear weapons capability only if the nuclear powers share hardware and information on industrial, scientific, and health applications while limiting and eventually cutting back their inventories of arms. It is, unfortunately, a notorious fact that the industrialized nations have failed to meet this promise, with serious implications for the non-proliferation treaty and the recent negotiations at both the "Law of the Seas" conference and the United Nations Conference on Science and Technology for Development (UNCSTD) which opened and closed in September 1979, in Vienna like an illstarred Broadway play.

At the time of my mission, the Ghanaian government had just revitalized its nuclear research program and was negotiating with the Soviet government for the grant of a small 3–5 MW "swimming-pool" reactor to be installed at a laboratory built nearly ten years earlier by the deposed head of state, Kwame Nkrumah.

Nkrumah had relied heavily on Russian technical assistance in the 1960's. He had secured the promise of the reactor for a center he constructed adjacent to the town of Kwabenya—a suburban federation of villages in the coastal brushland bordering the rainforest and near to both the capital city of Accra and the University of Ghana at Legon.

A vital element of Nkrumah's program was the advanced training of scientists and technicians. Bright young scholars were selected from among the students at the University of Legon and the Technical University in the Ashanti capital, Kumasi, and sent for studies to England, America and the Soviet Union. In addition, all the personnel who would work directly with the Russian reactor were sent to Moscow for technical orientation.

Russian equipment was shipped in quantity and stored on site as the construction neared completion. Just as the reactor was to be shipped, a military junta siezed power in February 1966, while Nkrumah was out of the country on a state visit. The new military dictatorship ordered the Russian technicians and advisers out of the country, called the students and scientists home, and disbanded the technical and administrative organization assembled at Kwabenya. Although the Ghanaian Atomic Energy Commission remained, its function was downgraded to providing an *ex-officio* club for the remaindered scientists.

So, in 1975, almost ten years after Nkrumah's ouster and the abrupt cancellation of all Soviet programs, the Ghanaian government found itself renegotiating with the Russians, attempting to rebuild its nuclear science apparatus, and preparing to receive a shipment of californium from the IAEA to be used in training students and technicians in the technology of radiation metrology. Ultimately the military government's effort would falter as would their programs to revitalize the economy and make Ghana inde-

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Irving A. Lerch is an associate professor at the New York University Medical Center.

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pendent in food production. In June 1979, another coup, engineered by a different generation of officers, swept away the failed order.

On my arrival in 1975, the Upper Volta on Ghana's northern frontier was in famine and a catastrophic drought was threatening to spread the Saharan wastes into the grasslands of West Africa. The government denied rumors that it had stationed troops on their border to stem the flow of refugees—a threat to the nation's precarious food supplies.

I found the senior scientific officer of the Kwabenya Nuclear Center agonizingly shy at our first meeting, a surprising personality trait in view of his education, travel, position and my modest rank. Eventually he would be purged. Perhaps he sensed his impermanence or succumbed to the temptation to inflate the status of national and extranational agents. It was clear that he was confused, unsure of the government's purpose in resurrecting the nuclear project and painfully aware of the lack of trained people and resources needed to start a vigorous preparation. He suggested that we visit the reactor building and look over the residue of equipment to see if anything could be salvaged.

What I saw of Nkrumah's grand project shocked and distressed me. Pieces of rusting, broken construction equipment littered the area. Brush and grass grew over the roads and encroached the foundations. The large reactor building was scalloped with sloughing concrete. All the windows had been broken out, and conduit and wiring hung from the ceilings and walls. Construction had been halted before the interior and exterior surfaces were finished and there was marked deterioration of the exposed materials. Nor was there any sign of equipment or construction supplies suitable for reclaiming what was obviously a derelict, abandoned ruin.

The administration quonset hut was filled with piles of segregated supplies: mattresses, sinks, tires for trucks and other vehicles long reclaimed by oxidation and rot, cabinets, cabling, and a variety of electronics. Much of the equipment had been jumbled together and probably purposefully destroyed by the departing Russians and picked over by Ghanaian soldiers who occupied the site. What remained was mostly vintage, broken circuitry which would have been impossible to mate with modern instrumentation—Western or Soviet.

We are in a cultural cell. The walls are translucent; they let in distorted images which we process as best we can, using the information-extracting machinery of our perceptions to distinguish shapes and meanings. We submit all incoming data to the processes of our descriptive verbal and symbolic languages. But our most powerful tools—mathematics, logic, analytical reasoning—are limited by the value of the information selected and fed into our data processor. If an important fact goes unrecognized or is rejected as is inevitable when one culture views another, the resulting analysis will be defective, perhaps perniciously misleading.

In 1949 the physical chemist, Michael Polanyi, who abandoned science for epistemology, wrote: "Any account of science which does not explicitly describe it as something we believe in is essentially incomplete and a false pretense. It amounts to a claim that science is essentially different from and superior to all human beliefs that are not scientific statements—and this is untrue." Polanyi understood the intractibility of perceptual bias. In the same essay he noted, "When you adopt one way of looking at things you destroy at the same moment some alternative way of seeing it."

In Ghana I was impelled by a powerful motive: to spread the doctrines of science and technology independent of the practical filigree. While there, I was not confronted by an alien value system at loggerheads to my resolve. The scientists whom I met at Kwabenya, Legon and Kumasi were cut from the same cloth as I was and despite the exigencies of starvation and poverty were equally committed to science as process. We all firmly believed that science enobles everyone it touches and that with technology, security and prosperity would someday be brought to the region. Aside from the obvious question of which science and which technology were best suited to these objectives, a question of vital importance that had never been rigorously addressed, we shared the same sentiments and were haunted by the same fears. "We know all we know from appearances," said the philosopher F. H. George, "and make, on the basis of these appearances, just whatever assumptions are necessary to make appearances consistent . . . ."

The product of perception, the *appearances*, differed greatly between scientists, diplomats, administrators, and politicians, and the resulting confusion debilitated the technical assistance programs of the IAEA and the participating governments. While political objectives are supported by appearances, we presume that an objective such as prosperity is firmly rooted in reality, in the composition of the needs of a society. Ghana *needed* self-sufficiency in food production but required

the *appearance* of technological mastery to be accepted as a modern state; by her neighbors, by the wider community of nations, by her own people.

Most of the technocrats in the developing south were educated in the industrialized north and are therefore inculcated with industrial priorities and myths. They have, in effect, exchanged their cultural perceptual filters for those of their technological mentors. This has greatly complicated the problems facing aid programs. In a Brookings Institution study commissioned by the State Department, the summary states in part that, "... development is an indigenous problem. Aid givers can help to introduce new technologies, develop institutions, train people and make capital available. But local social and political factors, the culture, and the leadership must be receptive to change." Yet this becomes more difficult to achieve as the gap between real and perceived needs grows because of training and conditioning which has removed local technocrats from the imperatives pressing on their countrymen.

The UNCSTD Secretary General, Joao Frank da Costa of Brazil, declared in 1977, "The actual substance of science and technology will *not* be under discussion at the UNCSTD ... The primary purpose of UNCSTD is, therefore, to consider how technology might best be harnessed as a means for salutory social change and economic progress for all peoples." Thus at an early date in conference preparations, the attention was focused away from the hard social and political issues and onto the problems of technology transfer—a volatile and largely irrelevant irritant to western industry fearful of the loss of their proprietary technology and the prospects of unbridled competition from the radical mass of developing states.

This was exactly the issue that dogged the discussants at the 1977 and 1978 "Law of the Seas" conferences and led the US Congress to the brink of confrontation with the "Group of 77" (representing over 100 poor countries) by threatening to pass legislation enabling American industry to begin unilateral mining operations in the Pacific without international agreement.

Nonetheless, as a result of UNCSTD, special development funds have been established and the West agreed to revitalize its aid programs—a promise which will be the first casualty of anti-inflation austerity moves and Congressional pique against the "nonaligned" movement.

There will be no immediate end to failed programs, exhausted and depressed experts, and growing international churlishness as the gap between the wealth of the industrialized and the impoverished nations widens.