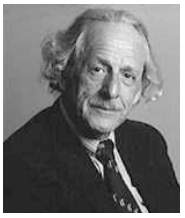
Essays of an Information Scientist: Science Reviews, Journalism Inventiveness and Other Essays, Vol:14, p.240, 1991



How to Boost Third World Science
An International Effort Can Maintain the Information Flow

Reprinted from *THE SCIENTIST* ® 1(14):9, 1 June 1987.

Scientists in the Third World face many problems, not the least of which is funding. Of necessity, Third World nations can not yet support science at levels commensurate with those of the developed nations. Meeting the basic needs of their citizens leaves the governments of developing countries with few resources to expend on long-term investment in the form of scientific research. So it often happens in the Third World that university and government research centers are understaffed, equipment is outmoded, and facilities are substandard.

Despite these and other obstacles, science is pursued in the Third World, and in some places, like India and Argentina, it is pursued with vigor. As Michael Moravcsik recently noted (*The Scientist*, April 20, 1987, p. 11), scientists in the developing countries produce an estimated five percent of the world's scientific literature. Although this represents a small portion of the whole, it is remarkable—given social, economic, and sometimes political adversities—that the output is as high as it is.

Unfortunately, there is too little concern in the wider scientific community and in governmental agencies of the developed nations about the day-to-day problems confronting scientists in the Third World. Aside from neglect, there is prejudice as well. Some scientists in the developed countries wrongly dismiss work in the Third World as being of universally low quality.

In this issue Philip W. Anderson mentions that recent and highly important work in superconducting materials was carried out in India and Beijing (p. 11). Even in the mid-1960s, researchers in the People's Republic of China were the first to synthesize bovine insulin.

Admittedly, these examples are somewhat exceptional. But if much of the research in Third World countries is of low quality, isn't it reasonable to suppose that lack of support, both from home governments *and* the developed nations, contributes to that low quality?

One support problem of which I have long been aware is the poor access that scientists in the Third World have to the scientific literature. In many developing countries, hard currency is scarce or unobtainable, which makes difficult or impossible the purchase of foreign

journals and books. Moreover, runaway inflation or swings in world markets against a local currency can greatly compound the payment problem. Even though a few publishers offer substantial discounts in nations where per capita GNP falls below a certain level, the problem often remains.

The UNESCO coupon program, established long ago, was designed to alleviate the difficulty of securing hard currency in Third World countries. The coupons, whose value is expressed in U.S. dollars, are issued in developing nations by the country's National Commission for UNESCO in exchange for local currency. The coupons are, in turn, accepted by many publishers, who can redeem them through UNESCO for payment in hard currency. They are good for the purchase of not only journals and books, but also audiovisual materials, school supplies, scientific instruments, laboratory equipment and technical machinery. The amount of UNESCO coupons that can be issued in a developing country is determined locally and varies from one country to another.

At present, 94 nations participate in the UNESCO coupon program: 58 nations sell coupons domestically and publishers in 36 nations are accepting them. South Korea makes extensive use of the program. I wonder whether this has contributed in part to that nation's recent dynamism.

Plainly, wherever in the Third World information access is improved, the productivity and quality of research will improve also. India, the giant of Third World science, is perhaps the outstanding example; there, better information flow has helped research in astronomy, astrophysics and biochemistry.

Despite the success of the coupon program in providing a means by which developing nations can make payment for scientific and educational materials, the materials, especially journals, are often greatly delayed or their flow regularly interrupted. Bureaucracies in many Third World nations move slowly. Such red tape can delay authorization for payment to journal publishers, even in UNESCO coupons, for many months or even a year after a renewal order has been placed. In some instances, a publisher will continue to ship materials despite lack of payment, but to do so gives no encouragement for payment. For the most part publishers must warehouse current issues of the journals, or cancel the orders altogether. If payment is at long last received, the warehoused journals are then released or the orders reinstated.

Imagine the frustration of the scientist in a developing nation who must wait endlessly for a current journal to arrive. When the shipment finally comes, it often contains six to nine months' worth of back issues that were held up by delayed payment. In another few months, the cycle will start again. Such broken communication can seriously undermine scientific performance. Information, after all, is a perishable commodity, and in many circumstances such delays reduce the value and utility of that informa-

tion. One result can be the unwitting duplication of research.

In my view, the UNESCO program should be extended or supplemented in the following manner: I propose that an escrow account consisting of a reserve of UNESCO coupons or hard currency be established at an international bank or intergovernmental agency. This account would serve to guarantee to publishers payment of orders from participating Third World nations. With the confidence that payment would be forthcoming, publishers could keep scientific information flowing to the developing nations. Thousands of subscription renewals could be immediately honored by publishers. Scientists need not suffer any more from the inefficiencies and foot-dragging of local bureaucracies.

Many publishers are keen to help promote Third World science in any way they can, but the economic realities of business prohibit indefinite service without payment. An escrow account would remove a major obstacle now standing between publishers and scientists.

Conversations with publishers, with subscription agents, with scientists interested in improving communication with researchers in developing countries, and with officials at various U.N. agencies about this proposal have proved encouraging. Many suggested that The World Bank might help, but I learned that this institution has not in the past involved itself with the administration of a program of this kind. I do not see, however, why it could not maintain the escrow account on behalf of UNESCO or some other international organization. Surely, World Bank doesn't mean only Big Bank. Solutions to practical problems often require small-scale assistance.

I ask readers of *The Scientist* to join me in discussing the problem described above and the idea I have suggested for its solution. It is a problem worthy of the creative contemplation of scientists worldwide and, in particular, of those attending the Third World Academy of Sciences conference, which will be convened in Beijing in September. Having gathered the best thinking on this matter, we can proceed with a formal proposal to the most appropriate agency. ■