

CHGO-22
Science in the Philippines II:
Problems and Opinions

27 Lugard Road,
The Peak, Hong Kong.

January 6, 1964.

Mr. R.H. Nolte,
Institute of Current World Affairs,
366 Madison Avenue,
New York 17, N.Y..

Dear Dick,

I could have left the description of Philippine science with the purely factual account of its organization given in my last letter. If I had done this I am sure my Filipino friends would be the first to criticize the report as not representing the real state of affairs. Certainly all is not as ideal as the framework would make it appear. It is my intention in this letter to pick out some of those points which are more controversial and report what I was told or saw. This is not done with any intention of criticizing the Philippines, but with a genuine desire to help by defining problems and presenting different opinions.

The Frustrations of the Filipino Scientist

The problems of the Filipino scientists were brought to our attention early in our visit. At the opening ceremony of the National Science and Technology Week, Senator Manahan, Chairman of the Senate Committee on Science Advancement, gave the keynote address. In a rousing and occasionally impassioned speech, he analysed the status of science in his Country, compared it with the status in other countries, and found it to be wanting. In a slashing attack on President Macapagal's Administration (Manahan belongs to the opposition party) he laid the bulk of the blame squarely on the shoulders of the Administration, and accused it of micro-thinking about science.*

A few days later I spent an afternoon talking with Senator Manahan. He has a great record as a fighter, both during the War against the Japanese, and afterwards in politics. He was a close friend of the late President Magsaysay, and after the latter's death in an aeroplane accident in 1956, Manahan ran for President himself as the leader of a third party. He was defeated, but two years later he successfully campaigned for a seat in the Senate.

Senator Manahan is no scientist. In fact he came by his assignment as Chairman of the Senate Science Committee quite by chance. The new Senators were eligible to take over the chairmanship

* Under President Macapagal's administration the Philippines spend less than one fifth of one percent of the gross national product on research and development, This is still more than under any previous President.

of those committees which had been vacated by the outgoing Senators. As Senator Manahan explained it, "There was a fight amongst the new Senators for the more prestigious committees. I had stated my own preference for the banks, but when the Senators threatened to come to blows, I held back and said I would take whatever was left after the others had their pick. Two were left -- Science, and National Minorities!" With what his admirers (and I found many among the scientists I talked to) said was characteristic zeal, Manahan threw his energies into the work of these two committees.

Manahan's advisors told him that the Philippines lagged behind other countries in scientific development. The Chairman of the National Economic Council attributed the Country's slow economic development to a science lag. As I am beginning to realize, there is no surer way to stir a newly developing country to action than to suggest it is behind another newly developing country in a certain field. It was about this time that Steven Dedijer published a paper in Science which had a remarkable impact on the Philippines. In this paper he compared the expenditures of different countries on research and development as percentages of gross national product. The Philippines was one of the twenty countries he analysed, and it ranked eighteenth. Not only that but Dedijer showed that the Philippines was 40 to 60 years behind the U.S. and 10 to 20 years behind New Zealand in scientific development. Manahan's committee set itself the task of probing the truth of the assertion that Philippine science was lagging, and if it was, why, and what were the bottlenecks. The Committee listened to 75 witnesses, including heads of all Government departments doing research, presidents of many universities, Peace Corps volunteers, and other foreign aid workers.

The findings confirmed a current of discontent among the scientists. The chief complaint was lack of funds for even the basic laboratory and office equipment and books. As a result the witnesses claimed that important studies are often not completed or started. Even when funds are available, it frequently takes a year before an order form for equipment needed from abroad circulates through the mass of red tape and the order is placed. Then, when the equipment arrives in the laboratory there are often several more weeks of delay until a Government inspector arrives to check it. Another monetary difficulty noted in Manahan's Senate Report was that of obtaining the release of appropriated funds from the Budget Commission. Low salaries and lack of prestige given to scientists were other reasons given for the frustrations of the Filipino scientist.

Several witnesses thought that the National Science Development Board (NSDB) had not done an effective job of promoting or co-ordinating research. Others thought that the practise of staffing Government agencies (including research laboratories) with incompetent people, as political rewards, was a major problem. In view of this it is not surprizing that Manahan's report suggests that "Most of the research is superficial and not geared to the Nation's economic and industrial needs."

Most of the witnesses agreed that the dissemination of research results by NSDB needed to be improved. In fact the whole problem of how to get research results disseminated and utilized in both industry and agriculture was realized to be a crucial one.

As the root of much of the trouble, the education system came in for a great deal of criticism. The inquiry found that most science teachers had no competence in the subjects they taught, they were poorly paid, laboratory facilities were inadequate, supply of textbooks was deficient, and only very few universities were doing research.

The Committee's report was submitted to the President in May, 1963, and along with it were several recommendations to improve matters. They included a Bill to create a science high school, another to exempt scientists from compulsory retirement. Other Bills provide exemption from payment of taxes and customs duties on scientific equipment, and simplify requisition procedures. But these are measures to chip away at the corners and one Filipino in a responsible Government position said to me later, "We should settle for nothing less than a complete revision of the Civil Service system. First we need to clear away the obstacles, and then get the best people in the country into the Civil Service".

In his capacity as Chairman of the Science Committee, Senator Manahan attended the second Rehovoth Conference on "Science and the New States" held in Israel last August. Both there and in other countries he visited on his way home, he saw what he called "a science ferment" -- a sense of urgency which he felt was missing in the Philippines. His speech at the opening session of Science Week had been prepared to help create that sense of urgency. Many scientists regard the Senator as one of the key men in the future development of the Philippines.

The Need for Research in the Philippines

Most of the discussions I heard were on how to expand and improve existing scientific activities. But I have often heard people in the more developed countries question the wisdom of newly developing countries spending money on any kind of research. I therefore asked several people whether they considered the present level of research strictly necessary for the Philippines. One of the people I asked was Roman Cruz, the brilliant young assistant to the young (36 years of age) Chairman of the National Economic Council. Mr. Cruz attended the Science and Government Seminar at Harvard in 1962, and in a Seminar paper on science in the Philippines, he wrote about this question. It is true, he says, that the newly developing countries can draw on the research work and knowledge accumulated in the more developed countries, but it must be remembered that, "First, the researches going on in the highly developed countries are almost wholly orientated to fit their own conditions: high labor costs, predominantly educated population, high incomes, given natural endowments, and -- in the case of the major powers, their deep involvement in weapon development and the race to space. Second, the researches in industrial countries may even present a serious

threat of harm to the under-developed countries, especially to the extent that they develop products and synthetics superior to, or capable of substituting for, the primary products and raw materials constituting the bulk of the exports and foreign exchange earning capacity of the less developed countries."

Mr. Cruz went on to state the need for newly developing countries to do their own research and development appropriate to their own local conditions. This research and development may run from the most humdrum modification of known technology to the most basic research. He points out that it is one thing to show that research is desirable, but quite another to show that it is feasible. "The more primitive is a society," he writes, "The less trained people will it have, and the less can it attempt any scientific work, Its primary task would be to develop the most elementary skills and use the most elementary know-how." He goes on to argue that there comes a stage in a country's development when it can do useful research, and suggests that the Philippines has reached this stage.

The NSDB Five Year Science Development Plan presented to President Macapagal a few months ago illustrates in a specific way the potential value of scientific research in the Philippines. The plan assigns priority to the following:-

- 1) Researches directed at increasing the utilization of natural resources to produce substitutes for imports.
- 2) Researches directed at upgrading and expanding the Nation's export products.
- 3) Researches directed at processing the waste products in agriculture and industry to develop consumer goods and export commodities.
- 4) Measures directed to develop scientific and technological manpower, promote social science research and science consciousness.

Within each priority area specific research programs have been proposed, all of which relate to local problems in the Philippines. Take the studies of cadang-cadang as an example. Cadang-cadang is a disease which denudes vast areas of the coconut farms every year. A method of destroying this pest would be of great value to the Philippines, and yet it is a research problem which has never been tackled by the more developed countries.

The Research and Development program will account for only 15% of the total cost of the Five Year Government Science Program (P169 million). Another 12% is earmarked for scientific manpower development, 3% for science promotion, 4% for other special projects and a whopping 66% for capital investments. These capital investments include a multipurpose pilot plant, funds for development of the Philippine atomic reactor center, a scientific instrument center, a tests and standards laboratory, a scientific library, a food and nutrition research center, a science

high school, and a Philippine Community of Science and Technology which would account for 53% of the total science budget. This latter establishment would be the center of Government research and development for the whole country. A few people thought that such a large expenditure on new Government laboratories was an unnecessary luxury at this time, but most seemed to think that present facilities were so crowded and archaic, that the proposed Science Community was a necessity.

Forces Opposing the Introduction of Science and Technology

It was suggested at the United Nations Conference on Science and Technology (UNCSAT) that each of the newly developing countries would find certain forces which tended to oppose the introduction of science and technology. It was recommended that each country identify these forces and prepare measures to counteract them. I made inquiries about such forces in the Philippines. Some of the people I asked thought that in rural areas the conservatism of the farmer was the chief obstacle to change. Others thought the family system was the stumbling block, and I was told of a farmer who, with simple new techniques, had doubled his rice crop in one year. But the following year he had reverted to his old system. Why? Because with the increased production, unwanted relatives had moved in and sponged. Superstition was given as another force which had held up progress. For example, I was told of non-Christian tribes who refused cholera inoculations during the 1961 outbreak of the disease because they were afraid that this was an insidious device to convert them to Christianity.

But the one force which was unanimously agreed to be the main hindrance to the growth and development of science, was politics. Here, politics was used in that rather contemptuous tone which implies "not quite graft and corruption, but almost". I have already mentioned the widespread padding of Government agencies as political rewards, and I was told by almost everyone I talked to of the celebrated case of the NSDB Chairman. The background to this is interesting because it illustrates several factors of Philippine political life, both good and bad. When the NSDB was formed in 1958, its Chairman was appointed by the President for a six year term, and could not be removed except for cause. The then President appointed Dr. Paulino Garcia to the post, which has Cabinet rank. But in 1962 when Macapagal became President, he accused Garcia of entertaining the opposition leader during the election campaign and insisted he resign. Garcia refused and when the President summarily dismissed him the case was taken to the Supreme Court. The Courts upheld Garcia's appeal and he was reinstated. "Whereupon," one senior staff member of the NSDB told me, "The President made it almost impossible for the NSDB to function by refusing requests for funds." An example of the difficulties this caused is the story of Philippine participation in the U.N. conference on Science and Technology in Geneva. The Philippines had submitted several papers and several months prior to the Conference, Dr. Garcia put in applications for travel grants. No word came until a few days before the Conference began. Then the request was refused. As a result, no-one was sent from the Philippines to Geneva, although, as a face-saving gesture, the

Philippine Ambassador in Berne was sent about half way through the Conference. Only when the pressure had been taken off and Paulino Garcia had won both legally and morally, did he resign. The President then appointed a Chairman of his own choice, Dr. Juan Salcedo, as head of the NSDB. It speaks well for both Chairmen that despite the uncomfortable situation which was created, they remained good friends. And perhaps, as someone remarked, the affair may have been a blessing in disguise -- for the first time in this politically conscious country, science became a nationwide topic of conversation. It increased an awareness of the importance of science in government perhaps more than anything else could have done.

Technical Assistance

At the Geneva UNCSAT conference there was a feeling among the scientists of the more developed countries of wanting to do something more to help. Abba Eban called it the "galvanizing of the scientific conscience". Yet just what could be done was not immediately clear. I had this in mind when I talked with people in the Philippines about technical assistance. My first objective was to inquire about past experience with technical aid, and secondly to ask what might be done in the future.

From the Philippine point of view I gathered that most experiences with technical experts had been satisfactory. Although there had been a few instances where the "expert" had known less about his subject than the Filipinos he had come to advise, and this had been taken as a slight. It was suggested that the countries who had sent these men had thought second best good enough for the Philippines. I was also told of one expert who, after spending several years on a "survey" and failing to turn in a suitable report, was found to have used his findings to his own personal advantage, setting up a business and making quite a killing.

There was dissatisfaction, on both the receiving and donating sides, with the system of experts coming in, making surveys, writing reports, and then leaving, with little follow-up action. For example, there have been at least four different UNESCO surveys on science education over the past 12 years. The suggestions of the different surveys were often contradictory, and there has been little follow-up of any of them.

One form of aid which seems to have been very successful is the visiting professor scheme, whereby professors come to a university in the Philippines for an extended stay of one or more years.

To find out about the other end of the stick, I talked with some of the people who were dispensing aid, and if some Filipinos had their problems with experts, so some of the experts had their problems with Filipinos. One of the experts who had been in the Philippines for over two years and who had given the matter a great deal of thought, told me of some of his frustrations. He told of the lectures he had given to empty halls, because nobody bothered to turn up; of the reluctance to ask for his advice or to

act upon it on the few occasions it was asked for; and of not being called to sit in on conferences where his speciality was discussed. (This was certainly not a case of his knowing less than his hosts, his experience and success elsewhere in the work the Filipinos were striving to do were well known.) "I have tried to rationalize why this is," he said, "I came out to the Philippines mainly for altruistic reasons, but there are times when I feel like catching the next plane home! Then I think, 'Well, if I were home and someone was sent from a foreign country to tell me what to do, I would also resent it and would also try to show them that I could manage on my own.' So I continue to try and be as diplomatic as I can".

After talking to several aid donors, I'm convinced most "advisors" are not really welcome at the working level. What is acceptable, and I think welcomed at all levels, is the arrangement whereby an expert can do a specific scientific job.

For the future, there were two suggestions which merit more detailed study. One was for an extension of the visiting professor scheme, with special emphasis on the setting up of graduate studies. The other was for a survey to assess the long term research needs. (Perhaps the best group to do this would be OECD.) It was suggested that the list of needed research be published so that those scientists in the richer countries free to choose their own research projects who were motivated to help poorer countries, could be guided in their choice. Even better would be an arrangement where the foreign scientists could do their research in the Philippines with Filipino scientists assisting.

In talks about technical assistance, sooner or later the conversation nearly always turned to two projects which, for cost to the donor, are unequalled in the Philippines. These were the International Rice Research Institute, and the Atomic Reactor. The International Rice Research Institute (IRRI) is a joint Ford and Rockefeller Foundation project, meant to serve all rice growing countries, but set up at Los Baños about 75 kilometers from Manila. The Ford Foundation put up the money for the buildings and equipment, and Rockefeller pay the recurring expenses. It was inaugurated in 1962.

The thing which immediately strikes the visitor is the opulence and lavishness of all the furnishings in the laboratory and especially in the staff and student living quarters. I found most Filipinos to be reticent in their comments about IRRI. Most felt that it was something I should see, but they seemed to feel it was apart from the Philippines and might just as well be on Mars for all the good it would do them. Non-Filipinos were more outspoken. Scandalous and provocative, were some of the adjectives used. Few would quibble with the money spent on equipment, but people find the trimmings offensive, particularly when contrasted with the poverty in nearby Los Baños. For myself, I'm not so sure. Clearly it is designed to attract the best people in the world to do research on what is one of the most vital problems in the world. Let's face it -- most scientists are not altruistic -- if they are to be persuaded to go with their families to live and work in a foreign land they want some incentive. Here they have it.

Everything depends upon the results. It is an expensive experiment, but the potential rewards are great.

The other aid project which was in the limelight during our visit was the new atomic reactor which was officially handed over by U.S. Ambassador Stevenson on December 9. The reactor, a 1,000 mega-watt "swimming pool type" was provided by America, but the running expenses must be met by the Philippines. Bearing in mind the advice given at the Geneva UNCSAT conference -- "Newly developing countries should avoid prestige projects such as nuclear reactors", I was curious to discover Filipino reaction to the gift. I did not find any Filipinos who criticized the reactor. All thought their country had reached the stage of development where they could make good use of the equipment. Several foreign delegates to an international conference on reactors which was held in Manila during our stay were more dubious of its worth. "On scientific grounds, its quite unjustified," they said privately. "Almost all of the useful isotopes have a sufficiently long half life that it would be much cheaper to fly them in from Japan, or even the States".

The best argument I found in favour of the reactor was that it would serve as a training ground for scientists who will later operate power reactors. There is good reason to believe that the Philippines may be one of the first countries in the world where nuclear power is an economic proposition. Some of the other reasons advanced in favour of a Philippine reactor are more intangible and some are certainly less worthy. For example, an editorial in the Manila Times on December 9, 1963, under the heading "Egg-shaped dome symbolizes the Republic of the Philippines' desire to keep in step" said, "Everywhere in Asia the egg-shaped dome which houses the atomic reactor has become the symbol of keeping in step with the march of modern science in the West. No Asian nation worth its salt can afford to ignore offers to build reactors in spite of the supposed hazards involved in their construction in or near metropolitan centers ..."

Apart from the purely scientific aspects I believe the real worth of the reactor will be measured by the number of Filipino youngsters who will be inspired by it to become scientists; the number of top Filipino scientists who would otherwise have immigrated and now remain; and the degree to which the nation advances in dignity and responsibility. There is a danger, however, that the public may expect too much from the reactor, and that disappointment and disillusionment may result in a lack of support for science generally.

Basic Research in the Philippines

Most of my discussions in the Philippines (and consequently most of this letter) were about the role of science in economic and social development. There is another aspect of science which needs to be mentioned. It is basic science, or science for its own sake with little thought of potential application. Most Filipinos agreed that there should be modest support

for basic research with emphasis on the type which can only be done in the Philippines. In fact three outstanding examples of basic research which I learnt of, all fell into this category. They were the tectite studies of H. Otley Beyer, studies of Philippine flora by Dr. Quisumbing, and the geophysical studies of the Jesuit priests at the Manila Observatory. All these have brought honour to themselves, their institutions, and indirectly to the Country.

o o o

The development of the Philippines has reached a stage where scientific research on a scale large enough to have an important impact on the economy of the country is possible. However, it is a young and somewhat turbulent democracy whose public generally does not appreciate the potential value of science, consequently there is no social demand for research. This puts a tremendous burden of responsibility on the Government, first to help create the demand, and this can only be done by education, secondly to develop the manpower to carry out the work, and this also depends on education, and thirdly to provide the money for all these things and for the research itself. I am encouraged to believe that the Government will be equal to the task by the number of enthusiastic and often brilliant young Filipinos who are in positions of great responsibility both in and out of Government.

Yours sincerely,

Geoff Oldham

C.H.G. Oldham.

Received New York January 9, 1964



At the opening of the National Science and Technology Week, 1963. Left to right: Professor Salvador Gonzales, Professor of Theoretical Physics, University of Santo Thomas, and head of Education Section of the Program Implementation Agency. Dr. Co Tui, Head of the Medical Section of the Program Implementation Agency. A lady delegate. Senator M. Manahan, Chairman, Senate Committee on Science Advancement. Mrs. C.H.G.O.. C.H.G.O., and Miss Josefina Constantino, Assistant to the President, National Development Bank of the Philippines.