

THE REMNANTS OF A SCIENCE CULTURE

Bienvenido F. Nebres, SJ, PhD
Ateneo de Manila University
Loyola Heights, Quezon City, Philippines

There is a quote from E.F. Schumacher's *Small is Beautiful* that comes to me as I read about our goals of becoming an NIC by the year 2000.

Let us imagine a visit to a modern industrial establishment, say a great refinery. As we walk around in its vastness, through all its fantastic complexity, we might well wonder how it was possible for the human mind to conceive such a thing. What an immensity of knowledge, ingenuity and experience is here incarnate in equipment. How is it possible? The answer is that it did not spring ready-made out of any person's mind – it came by a process of evolution. It started quite simply, then this was added and that was modified, and so the whole thing became more and more complex. What we cannot see on our visit is far greater than what we can see: the immensity and complexity of the arrangements that allow crude oil to flow into the refinery and ensure that a multitude of consignments of refined products, properly prepared, packed and labeled, reaches innumerable consumers through a most elaborate distribution system. All this we cannot see. Nor can we see the intellectual achievements behind the planning, the organizing, the financing and marketing. Least of all can we see the great educational background which is the precondition of all, extending from primary schools to universities and specialized research establishments, and without which nothing of what we actually see would be there.

Least visible of this infrastructure is culture, the scientific and technological culture necessary to industrialize and to become agriculturally more productive. I shared some thoughts on needed areas of growth towards a scientific culture at the March 11 meeting of the National Research Council of the Philippines and present some of them here.

My first point is that our culture is dominantly *relational* and it needs to move more to the *rational*. Put another way, we *interact* a lot. A scientific culture demands that we act more. In the mathematical culture in which I lived during graduate student days, the rational tended to invade the relational, and lunches and coffee breaks were dominated by intense discussions and scribbling on napkins of mathematical formulas. I do not know if that was healthy. But in our culture, the rational is overwhelmed by the relational. Lunches and *meriendas* dominate our scientific meetings and discussions on planning. Comments on scientific papers often interact more with the speaker (long introductions, lavish praise) than with his or her ideas. It is not that the relational is not important. We have to interact and build mutual understanding and trust. But once that is done, then we have to buckle down to work, to think, and to act.

(This article was published in The Manila Chronicle, 3 April 1989, pp. 4 and 5. The editorial staff asked the author's permission to reprint it in this maiden issue of Agham Mindanaw because they believe that the subject is still relevant to the reality of science and technology in our country. – Ed.)

One consequence of the weakness of the rational in our culture is that we do not take ideas and plans seriously. I remember Professor Salvador Gonzales at one science convention, waving a small volume before the audience and saying, "My dear friends, today we celebrate the tenth anniversary of the non-implementation of this science plan." In a more rational culture, the completion of the planning process signals the beginning of intense, hard work, because the written plan now becomes a measure of what has or has not been done. But the work ended with the completion of the written plan. As fast as I can gather, its only usefulness is to be part of the review of the literature when another group will meet a few years from now to formulate another Science Education Development Plan.

The question of planning brings us to our sense of time and our ability to envision the future. I am not so much speaking about Filipino time, though that is part of it and I must say I have noted general improvement in Filipinos being on time. What I mean rather is that in a traditional culture, things change little and there is little sense of moving towards the future.

Our sense of the future is the past recycled. I feel that even our scientific meetings belong to the traditional culture. Our annual assemblies differ little from one another and the next plan will be the old one recycled. It is part of the ethos of a traditional society that the past governs the present and the future. But science and technology aim to change things. In a scientific culture, therefore, the future guides the present. Thus, a scientific culture demands that we struggle to discern the shape of the future so that we may know where to focus our efforts in the present.

Another area is the balance between the qualitative and the quantitative in our assessments and judgments. Science and technology demand measurement and precision – and emphasis on the quantitative. A Jesuit scientist friend told me of going to Raon to buy some wire, which he needed for equipment he was building. The shopkeeper had a perfectly good tape measure on the table. But he did not use it. He measured the wire on notches marked on the table. His comment was that our culture understands the jeepney engine. Its tolerance for imprecision is such that it can bear with our attitude of *puede na*. But modern machines demand higher levels of precision and we would have trouble unless our technological culture grows. The world of numbers also is a problem for us. Several times in the newspapers I read a headline, which said that, DECS got an 80 percent budget increase. The story then goes on to detail that salaries went up 30 percent, maintenance and operation expenses 30 percent, capital outlay 20 percent – for a grand total of 80 percent!

Finally, a word about good will and competence. There is a story about two brothers, both heirs to the French throne. It was said of one that he could but wouldn't, and of the other that he would but couldn't. So things did not change.

Newspapers are full of analyses of people's motivations and their good will or bad will. It is rare that one hears serious discussions of competence. We talk of growing in science and technology in terms of state-of-the-art computers or electronic mail. But the heart of the scientific enterprise is competent scientists and engineers. A scientific culture demands a more hard-nosed assessment and development of competence.

Developing a scientific culture, of course, demands time and money. But as the Bataan nuclear power plant, the dendro-thermal and tomato plants in the north, our frequent brownouts and low productivity in industry and agriculture show, scientific and technological weakness or incompetence may be even more expensive.