

Address

Norman E. Borlaug

Hony. Governor, 2nd ICSC

Mr. Chairman, members of the presidium, delegates and friends:

Hang on to your seats because I am going to use very few words and some of them are going to irritate. So hang on.

In 1970 when I received the Nobel Peace Prize this was before the full impact of the so-called first green revolution had hit the broad stage as developed to today. It was largely confined at that time to Pakistan, India, and Turkey. But I perceived at that time and in the Nobel lecture I said that I thought that the science and technology was available on the basic crops to produce the food that would be needed through to the year 2000. This is shown to be the case as on today. So it had ups and downs and there were changes in the food prices in the last two years because the stocks were permitted to go to too low a level and we saw, of course, great increase in price which provoked a lot of protest from certain individuals who stated that we were on a downhill slide and that hereafter food was going to become more scarce and more expensive. This does not seem to be the case because even in the last six months the output of wheat, corn and maize has touched an all-time high. We have to be careful about all we hear and because we do not speak out and contribute to this confusion. This creates all sorts of problems. Dr. Serageldin is faced by these kinds of problems day in and day out and by our muteness, or our unwillingness to speak out against those who are saying things that adversely affect the food production in the Third World, we contribute to it. I speak out of sympathy, not as a criticism and I speak as a member of the Academy of Sciences of which Dr. Swaminathan is also a member and several of you are also members. One of the sad tragedies was when scientists did not speak out soon enough and a pseudo scientist destroyed virtually all the good scientists and in the process because he had a link to two leaders in the political front over a long span of time destroyed not only the Soviet scientists but contributed most to the disintegration of the Soviet Union. And we do not know how many individuals of this kind are involved in this mainstream of environmental issues.

In the most remote areas of the USA untouched by human beings, is the largest splendid area in the country. I have learnt to know nature. I knew its complexities how it sooner or

later gets out of balance due to natural forces. Insects destroy vast tracts of lands and tree species reaching near maturity. All this goes on as a natural course. Somehow the new environmental movement which started about 25 years ago has given the impression to the general public that scientists are dangerous individuals and that they are recommending all sorts of changes. There are several institutions that are either ready to support or are not in support of agricultural research, education and extension. These factors have a great deal to do with whether we are able to continue to produce the food that is needed for the rapidly growing world population.

We must remember how fast this change has taken place as a result of the changes and improvements in public health and medicine. In my lifetime, worldwide population has grown from approximately 1.6 billion to 5.8 billion. We are adding another billion every ten years and the more undocumented, emotional obstacles and confusions there brought into the focus by today's extremists—the general public is being given an impression that much of modern science and technology is destroying the environment. We are being poisoned by the existence of pesticides and by fertilizers. They group together all fertilizers, insecticides, etc. all of which have different toxicity. It is easy to blame the press, I do not. I blame us, the scientists. We must know how to sort out and clarify the picture. And it is up to each and everyone of us as members of different scientific organizations to speak up when we see some of these criticisms going far off the track, and when it is obvious that they are doing great damage especially to the underdeveloped nations. Psychological and emotional pressure is built into this propaganda not only to contact the World Bank, and affect projects in almost every country at least in most of the Third World countries. I have lived up to this for 52 years and I know how effective this kind of propaganda is. We need to look ahead and estimate where the real explosive parts are for the next couple of decades. In the mid-sixties it was South Asia and East Asia. Dr. Paroda has given a good summary of what happened to food production here in India in the sixties. The same sort of changes have taken place in many other countries—Pakistan, India, Indonesia, Thailand, China. All of these have made tremendous progress. The immediate danger is now in the countries of the south. We have seen the mass movement in the last few years of hungry miserable people, part of it is due to ethnic conflict but at the root is poverty and misery. And the only way to change this is by the exploitation of science and technology that is appropriate to those areas.

For the last ten years we have worked in African countries south of Sahara. We have addressed more organizations. We are using the technologies of the following international institutes among others IIT, ICRISAT, CIMMYT, and the Potato Institute. The help came through a telephone call from Mr. Sasakawa in about 1984 and he said, "I have given a large sum of money for emergency food especially to Sudan and Ethiopia, but I want to know why something has not happened to change the pattern of food production because I know that this is an emergency and it is time to make changes." He asked why something was not being done there like what happened when we first moved the wheat and the rice into India and Pakistan. I said, "I am sorry, I know nothing about Africa, south of Sahara. I have retired. I am trying to be a part-time professor and a consultant and I am too old to start again." He called back the next day and said: "Young man, I am 15 years older than you are; we should have started yesterday, but now start tomorrow." After a couple of workshops with European scientists and some American, Canadian and Australian scientists who had the experience in Africa we decided to start a small programme with farmers for five years in two countries, thinking that if we were successful, we would expand. I thought it would be a research programme.

We travelled through six countries in trying to decide which countries to begin with and surprisingly there was a lot of information at the experiment stages at the universities but nothing was going into the farmers' fields. There was no communication, as is generally the case in developing nations, between the researchers who are much better trained and the extension people who are generally diploma or certificate holders. We have tried to be the links. The results are on the basic crops being developed by the institutes that are mentioned, using their data, their best plant materials, not necessarily what came directly from those institutes but what were modified and re-selected by the national institutes of the country. What has been the result? We have virtually no exceptions by using the best variety, taking the data on the dates of planting, proper fertilization to restore soil fertility which had been mined out over decades, controlling weeds which become very aggressive when one suddenly puts some fertilizer and then trying to control the diseases in the varieties, by proper use of insecticides and fungicides. In the case of herbicides those come in later.

With all this happening in the African countries, what have been the results? Normally one can double output with moderate inputs of fertilizers. Generally the yield can be tripled and frequently quadrupled. Then why is this not happening? This is because of the confusion that comes out of funding for these countries. The funding agencies feel the pressures by the extremists in these groups who have captured the general movement of the environmentalists. And again there is the impression that we are on the verge of being poisoned out of existence. Take the USA as an example. What was the life expectancy at the turn of the century? In 1900 life expectancy at birth for a girl baby was 48 years and for the boy babies 46 to 47 years. In 1994 the life expectancy was 73 for a boy baby and 80 for the girl baby. Are we then being poisoned out of existence? If so, how do we keep living longer? Most people should understand that there is a biological time clock in all species and that starts ticking the second when we are conceived. Apart from the genetic background, to a large extent—we determine our own maximum potential longevity by our life style. Do we eat properly? Do we get proper rest? How many drugs do we take? How many cigarettes do we smoke? In other words, besides the biological time frame there are other factors to which some are more sensitive. The sooner we reflect this to the general public, the better it is. We confuse the general public by keeping quiet, and this results in loss of faith. This situation is getting worse in science and technology. This is not only in the developing nations, it is worse in the affluent nations.

Six or seven years ago, Ethiopia was classified as India had been back in the sixties as a hopeless case and there was no way of solving the food problem. It is one thing to talk about production which has been achieved enough, and that equity of distribution is an important issue. But, we have to first produce food before we can distribute. I am not particularly interested in distributing poverty equitably. I need to see change in the positive way first. In Ethiopia we have 10 staff field members. Who are they? Two Mexicans, three Africans, two Americans and one Japanese. One man in each country working from within the extension service, trying to put the spirit in it and link the research and extension people to upgrade the training programme for the extension people. Ethiopia will soon be self-sufficient in food production in basic cereals. There are other countries that will follow as soon as this objective is achieved in Ethiopia. So I now look at the African countries south of the Sahara to see if they need support. The seeds in most cases are there, they need to be improved. That is a continuing process. And you in the international institutes are doing this working closely with the national programmes. We have to upgrade the national programmes. I have seen some very good national research programmes. I was affiliated with that some of the best in the world. But I saw them destroyed by inflation and by withdrawal

of budgets and what was left was the effort to resuscitate them. New efforts and new vigour are needed.

The need is also to have the enthusiasm. I have seen in one country after another and it is important to find a few good, vigorous young enthusiasts like Swaminathan and Paliwal here. Both of them were very young when I first knew them and they were sparks that carried their efforts and enthusiasm to people at the senior level. This is not to say that there are no senior scientists who have the vision and want change. But too often I have seen not only in research but in extension as well, that when they get to the top, the attitude is not to rock the boat, not to bring in new science and technology, you might be kicked out, you might be dumped. This is how it is in the developing nations. Remember that in the complex issues raised by environmentalists, there is a lot of emotion and all too often many issues are moved on emotion with lack of scientific evidence. This is not to say that we should not be careful with agricultural chemicals. But it is no different to medicines. If you go to a doctor, and his diagnosis is wrong, the medicines he prescribes may kill you. Yet a correct diagnosis, and correct medication means you will be cured. The situation is the same with agriculture chemicals. This is also the situation with many gadgets that are meant to improve the standard of living of the people. In the USA a vehicle called the auto mobike killed 45,000 people a year and injured three million a year. But they do not stop using it. Yet we are told to stop using chemicals in agriculture. What kind of business is this? We have to reflect on how comfortable is it to stay in one's office and hear all this over-exaggeration of many issues being put out to the general public. Isn't there enough reason then that the general public is becoming more and more skeptical of science and technology? But I must say that I continue to be extremely worried — by the relentless growth of the population monster. Where will it all end? We have no choice except to produce, and utilize the science and technology to produce more for the most basic need of a civilization — food, and ensure its equitable distribution. The population growth is unfortunately faster in the developing nations, and therefore it is more complicated to try and lift the people to a standard of living with the conventional wisdom that smaller families give the children better opportunities. We have to bring the awareness up to this level. We have to continue the role of education, to apply science and technology so as to understand the total carrying capacity of this planet in the different geographic regions. If we overshoot it, we all know the consequences.

I am sorry, I speak so bluntly. But I am impatient with so many pressures that are put on the system by the elitists of the affluent nations that adversely affect the developing nations, based on too much emotion and too little scientific fact.