"FOOD & POPULATION GROWTH"

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While I'm speaking, world population will add another 2,000 people .... that's exactly 15 minutes, at the outside.

We've been talking for the past two days about the growing food problem. Most of the conversation has hinged around the one most important ingredient of all – fertilizer. It's only with the proper use of fertilizer that we can hope to continue to meet growing food demands of the world. A world that, with a few exceptions, is running out of arable land. Brazil still has vast tracts of land that can be brought under cultivation. But there are few countries with this potential. So what we have to do always is to try to make each acre of land produce much more than it has ever produced before. And, I think that with the introduction of new scientific discoveries and new technologies, this is being done. There are those who say, that the land is wearing out, that we are depleting our resources, and in certain places abusing them. But, I would like to point out the other side of the picture.

I grew up on a very small farm in the very northeastern corner of Iowa. Nearby was a small tract of land, a half section of virgin prairie. And when I go and stand in the center of this tract of land in mid-summer -- it's not very impressive -- it's the way it was when the pioneers came. And, it's especially not impressive when one looks to one side and sees beautiful fields of clover or alfalfa and to another side hundred-bushel corn or 35-bushel soybeans. If you look back a bit farther into the history of the five major cornbelt states in the U.S.A., you will see that in the mid-1880's the average yield in those states was 25 to 26 bushels of corn per acre. Today, it stands at 100. Have we destroyed the fertility, or have we improved the fertility? Obviously, it isn't just the soil fertility that's involved. We have learned how to prepare the land better, how to control the weeds and the pests, and we have improved seeds to go along with the better use of plant nutrients. All of these together have made these tremendous changes and it's the only way we could feed the population of the world today. But we have a tremendous job ahead of us.

In 1971, there was an all-time record of cereal grains produced in the world ... 1,106,000,000 metric tons. Now, in the developing countries, a large part of these grains are consumed directly because there isn't enough grain so they can afford to convert them to meat products: Chicken takes 3 pounds of grain for each pound of meat; or 5 to 6 in the case of ham and pork; or 8 to 9 in the case of

beef. So they must eat the cereals direct, whether it be rice, or wheat, or combinations, and then supplement their diets with legumes or kidney beans, if it's in a corn or maize diet, or in India or Pakistan, it will generally be lentils or pigeon peas.

But, to go back to this figure -- this record crop -- 1,106,000,000 tons. Visualize it as a highway built of grain that goes around the earth at the Equator, 18-1/2 meters wide and 2 meters deep. That's what that all-time record crop of '71 represented. Quite a pile of grain, put that way.

But, we are growing; the population of the world is growing by 76 million more people each year. This means that just to stand still . . . : to produce the same per capita supply . . . we have to produce an additional 27 million tons every year. That means we have to start building a new highway of grain around the earth at the rate of 1,000 kilometers, or roughly 600 miles, each and every year. But last year, we didn't complete the original highway because world production, because of droughts, went down by 42 million tons, but population growth kept going up and up. And, so, in these last two years, when we should have built these 2,000 kilometers on the new highway, we will have built, if the estimates are right, only 300 kilometers. So we have fallen behind.

But, why didn't more people starve? The reason, of course, is that we're living out of our reserve stocks. These stocks have dropped something on the order of 40 million metric tons of food grains during the past year. And, if something happens in the next 2 or 3 years, and these stocks are not replenished, there could be 50 to 200 million people who would face death from famine. People say the situation isn't so bad, because reserves were just as low 20 years ago. But, we now number 1,100,000,000 more people than we did 20 years ago. So, to compare those reserves with the reserves of today is meaningless. That's the situation we are up against.

If we look at the most important ingredient in increasing food production, it comes back to fertilizer. To produce the 27 million metric tons of grain that we need to add each year, we are conservatively estimating that we will need to produce 2,700,000 more tons of nitrogen . . . half that much of phosphate and, perhaps, one-third that much of potash each year . . . just to hold the line. We aren't going to correct these things over night, and we're all in this trouble together.. Whether you work from the standpoint of trying to grow the plants, or produce the fertilizer or finance all of these new investments, it's all part and parcel of the same picture.

Now, how could we have gotten into this trouble? I think that we've been carrying inadequate reserves to take care of a bad year. This year we've seen that what were thought to be adequate reserves just weren't adequate. But, anyone who sat down and looked at the figures couldn't help but be aware that there had to be some other kind of a reserve to back up the one that has been provided by the grain exporting nations since the end of World War II. They served as warehousers, brokers and bankers for the effective grain reserve over that period of 28 years, and world grain and food prices were surprisingly stable because of this cushion, or buffer. But once these reserves were depleted by the events of the past year and a half, everything was thrown out of equilibrium and prices skyrocketed. And it doesn't make any difference whether you're talking about bread or about meat -- it's all part and parcel of the same problem.

As incomes go up, people eat more animal products. Several pounds of grain are converted into each pound of meat, cheese, eggs, or whatever the substance is. This is a luxury and, as we get more crowded in this world, we are going to have to find ways to balance diets by building and designing new forms and varieties of grains; and at the same time improve the production of beans, chickpeas, and other supplements needed to balance cereal diets.

These are things that have been neglected. In

the case of improving diets, or improving the nutritive value of cereals, the know-how has just been opening up -- over the last 8 or 9 years in the case of maize, within the last 3 years in the case of barley, and within the past few months for sorghum. Curiously enough, we haven't found that we can manipulate genetics in the two major staple foods, rice and wheat. We have to look more ... and we have to look fast.

But, let's not be pessimistic. When we look at what the world has built in 12,000 years, great things have been achieved. And they were not achieved by pessimists. Had the naked apes, our ancestors, been pessimistic when they had a rock in one hand and a club in the other and an empty stomach, they'd have never made the grade, and we wouldn't be here discussing the problems we face today. So, I have faith in the future if we organize ourselves, and I think that one thing that we must all do is to not pass negativism on to our sons and daughters. This is a poison that's worse than any other.