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Speech to the Northwest Conference on Alternative Agriculture

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November 21, 1974 Today I am going to outline what I believe to be some of the critical problems that we face as a nation in the area of agriculture, raw materials, energy, and the kind of industrial civilization that we have developed. Today the consumer is net facing the human or personal force of someone trying to gouge another by overpricing. Rather, we are facing rising food costs which are the culmination of many years of high technology and cheap energy which have brought the American food system to the point at which many people cannot afford, nutritionally or economically, to eat real food. The food which is available is, in many cases, a processed homogenized packaged product which has very few calories and bears little resemblance to what was once available in this country.

Today it takes approximately twenty calories of fossil fuel to deliver each calorie of food to the consumer. A few years ago this did not ring much of a bell with me. Often statements such as 'Food production in America consumes about 3 percent of all energy used' are quoted; and this doesn't seem like very much. Then I came across a very unusual document, one which was prepared by Stanford Research Institute for the United States Office of Civil Defense, The report was trying to evaluate how agriculture would withstand nuclear war. In the preface, they said "We can state immediately that without petroleum fuels, crop production is virtually impossible in the United States. All major food and feed crops are mechanically planted and harvested. In addition, the application of fertilizer and pesticides in cultivation is dependent on machinery. Truck garden crops depend more heavily on hand labor but still utilize considerable machinery. Even livestock production utilizes considerable quantities of petroleum, particularly for transporting feed and animals." This report is saying that if there ever was a nuclear attack, you'd have a lot more to worry about if the attack were centered on the refineries and the oil processing depots than you would if the fields themselves were bombed because the agricultural system depends a lot more on petroleum than it does on land, or labor, or anything else.

Once the small family farm existed in great profusion all over this land. In about 1940, 30 million Americans were involved in farming. Today, there are fewer than 8.5 million Americans in farming. The last thirty to forty years have witnessed an enormous shift in the makeup 'of the population. The family farm of thirty. years ago was an average size of 167 acres; at this time this was a very productive system. The yields were not as great, but since most people lived in rural areas, there were less urban and non-agricultural mouths to feed. Today, the average size of a farm is 400 acres.

The increasing use of chemicals, which themselves are made from fossil fuels, represent another dramatic change in agricultural production. From 1946 to 1968, roughly a twenty-five year period, we find that nitrogen fertilizer use increased 534 percent, calculated on a per acre basis, Pesticide use was up 213 percent in that same period. A study conducted at the Center for the Study of Biological Systems in St. Louis concludes that about 11,000 tons of nitrogen fertilizer produced a yield in Illinois one year that 57,000 tons was required to produce in a later year. There has indeed been a tremendous increase in agricultural production, but this increase has been a result of the massive use of fertilizers, herbicides, and pesticides which are derived from synthetic sources. This means, essentially, that we have made our agricultural system very

dependent on synthetic products whose cost can only go up as the supply decreases.

Just before beginning this speech, I was asked by a newsman if I was interested--as an environmentalist--in curtailing the productivity of the American farmer by continuing to place restrictions on such products as pesticides. My response was really, in a sense, an evasion of the question. We are currently using critically high amounts of our resources to produce quality food to feed people. This cannot last. I don't see this use of resources as creating a conflict between the environmentalists and the farmers; rather, I see it as a conflict between the consumers and the producers. It is between these two groups that the real struggle of cost, quality, and quantity will eventually have to take place.

One of the great ideals of agriculture has been efficiency. Now we find that the whole meaning of efficiency is being re-evaluated; and in some cases, we're even finding that the old idea of efficiency is running a little bit in reverse. One study I looked at to try to get an idea of what the other side is saying was done by the President's Council on Productivity, a group appointed by the White House to examine how productive the economy is. In their study they concluded--after twenty or thirty pages—-that mechanization. in this area or that area was good and that we are getting more and more productive. Then they slipped in a footnote at the back of the report which cautioned that, although 10% more California tomatoes are being produced this year, each tomato contains 4—5% more water, We are actually producing more tomatoes but less food. Certain chemical techniques have finally produced something that looks like a tomato but in reality is simply a water bag. In this case, efficiency might better be measured in terms of calories of food rather than quantity produced.

Dr. George Borgstrom at Michigan State University has done some very interesting work in the area of basic resource use and calorie consumption in the United States and other countries. Statistics which are often cited by United Nations reports indicate that in India the approximate adult consumption of calories comes to 1,190 calories per day. In America, which is blessed with a gross abundance of food, the figure is 3,300 calories of food per day. Taking what Dr. Borgstrom has done in some further research, we find that this is a little misleading, because the Indian diet contains very little meat. What meat is in the diet represents an addition of about 1,000 calories of food that the animal had to oat which was then consumed by the individual. This brings the Indian total a little higher. However, in America, due to the heavy meat orientation if the diet, the real calorie consumption of each individual is about 10,000 calories, because it takes about 6—7000 calories to feed the animal which the individual then eats. On top of that, if you include the fossil fuel that goes into everything from lighting the Safeway to running the diesel irrigation pump, you will find that the calorie consumption of each American per day comes closer to 100,000—200,000. This is a staggering, almost unbelievable figure.

It has been assumed in this civilization, or at least since the industrial revolution in the west, that the best way to feed people and to clothe them was to increase energy use and to increase mechanization. The standard line was "the bigger the better." An example of this is the process of feeding and housing animals for slaughter in monstrous feedlots. A few months ago I visited one feedlot—Monfort's in Colorado—which processes about one and one-half million animals per year. The animals are penned in very small lots. The feed for the cattle comes from numerous sources. Part of the feed is laced with antibiotics and other drugs because you can't keep animals confined in small areas without paying a big price in disease; and the best way to control that is-—of course-—through the use of drugs. Feed is, for the most part, trucked in from all over the Midwest; but some of it, like the Peruvian anchovies, comes from many thousands of miles away. The corn grinding operation at this one feedlot is a flaking machine which makes corn flakes for the cattle to eat, This machine makes more corn flakes per day than Kellogg's makes for people, which gives you an idea of the size of the operation. Monfort's supplies about 2% of the beef for the American public.

In a study which interests me, Dr. Herman Koenig at Michigan State University looks at feedlots and concludes that a feedlot, even using as much machinery and fuel as you can, reaches maximum efficiency at about 200 cattle. We can look at that another way: it isn't part of a natural evolutionary process that we have these huge lots which hold 150,000 cattle, or that we have farms that span many many thousands of acres-all covered with a single crop. One of the

reasons these exist is political. We have developed a tax structure which very handsomely rewards individuals for creating massive conglomerates and for creating certain huge institutions such as corporate farms and feedlots. As we look at the predicament we're in--taking it solely from the vantage point of the consumer——it is difficult to understand some of the extremely high and currently spiraling costs of food because there have been very few economists who have examined the efficiency of scale. In other words, it is easy to say that the environmentalists want to keep the farmer from using pesticides, but it is quite a different question to ask whether the consumer is receiving quality food or not. The rather obvious answer is that no, the food has been so processed and so chemicalized that it can no longer be equated with the food that people were eating thirty years ago. This has been borne out by every study I know of, including one by the National Academy of Sciences which indicated that food value-measured in terms of protein alone--has decreased significantly over the years.

An even more important question to ask of every person is: Are we being overcharged for food because we have allowed the mechanics of our economic system to justify a gargantuan Frankenstein monster in oversized agriculture? I'd like to quote Dr. Koenig directly from an interview: "An alternative we should begin to think of is limiting the scale of mechanization to provide job opportunities. This carries with it the potential of generating an in— creased distribution of people on the land, and proceeds to put us in better harmony with the environment, It would also relieve many social stresses.' This question has rarely been pursued by the USDA.

One of the areas I think we're all interested in at this conference is organic agriculture. For several years now, the folks at the Rodale Press in Emmaus, Pennsylvania have made an annual pilgrimage to the USDA, pointing out that there are over 10,000 rather large organic farms in this country. They have repeatedly asked that the USDA hire just one staff person to respond to letters and to recommend ways of going about agriculture without being indebted to the chemically—oriented, high—energy—consumption way of life. Every year, including this year, the USDA has refused, dismissing the people who are trying to do things a little cheaper and a little better as a bunch of nuts.

The USDA needs to begin to examine some of their own reports. They have completed several studies in the last few years in which their Economic Research Service has concluded—-in one study called "The Economy of Scale in Agriculture, and in another study called "The One-Man Farm"--that the big farms are not efficient. The maximum size of an efficiently operating farm, according to their own calculations, is three to four hundred acres.

Because of this false sense of efficiency, there is an increasing trend towards capitalization in agriculture. To quote Forbes, a business magazine: 'If you don't have $850,000 today, and if you can't raise over a million dollars by 1980, you might as well forget about farming." They concluded that you've got to be a millionaire to farm.

Not long ago, a program was developed whereby any person in this country could go out and homestead 160 acres, Well, a lot of people tried it and found bad land and it didn't work. Other people tried it and found some good land and fund that. the key 'to it was irrigation. One of these areas was in California; and the need for water gave rise to the California Water Project. When the California Water Project is completed it will have cost $500 for every man, woman, and child in the state of California One of the justifications for the project was that it would produce a lot of energy because you would start damming rivers and you would get hydropower, and some of the water would be left for all those small farmers down in southern California. One thing that is important to mention is that by California law, if you farm more than 160 acres you're not supposed to get any federal water. Federal water is supposed to be reserved for people who farm 160 acres or less. The justification for this project was that it would produce all this energy: now they find that within five years, the California Water Project will use thirteen-billion kilowatt hours of electricity per year and will generate only five billion kilowatt hours of electricity. Therefore the consumers who are already being soaked to the tune of $500 apiece are going to have to subsidize all those small farmers for eight billion kilowatt hours of electricity per year. As for the water supply, somewhere between the seedling and the supermarket somebody got confused on .the 160 acres. The way the water law actually works seems to be that, if you're stupid enough to

own less than 160 acres, the Federal Water Project certainly isn't going to allow you any water. The people who are getting the water are those who farm in excess of 5,000 acres. 'The two farms I visited, one at Tennaco and one at Superior Farms, were more like 30,000 acres. These are the farms that are getting the water.

In the water project area you will find a big canal running down the valley with a big barbed wire fence around it. There are a lot of people who live, near that federal canal who have small wells that are very saline, and they can't get good drinking water. Scalpers come along and sell them a can at a time for a few dollars and that's how they get their water. So on the way to developing agricultural values in this country, our laws, our legislators, and our planners have made it possible for few large industries to make a mint and for the small people to be virtually kicked out of agriculture, We need to revive some of the long—forgotten and dusty mottoes of the USDA, and make it possible for people to live 'on the land and humanize American agriculture, as well as have a more productive system.

O.K., so we have a few problems. What have we done for the rest of the world? We have implemented the Green Revolution. Dr. Norman Borlaug got the Nobel Prize a few years ago for developing certain very high-yielding hybrid seeds of wheat and maize. Much of the work was done in Mexico with grants from the United States and 'several foreign governments, the Rockefeller Foundation and-the Ford Foundation. The object of the Green Revolution has been to give a kind of super-agriculture technology to very poor nations, and in the process enable more people to be fed. The only catch was that, in order for the hybrid seeds to respond very well and to produce the high yields, a lot of irrigation water and—-in many cases—-pesticides were necessary. Something I saw in Time magazine sums it up: On one page was a photograph of maybe fifty Indian farmers who were sitting around a parched field waiting for diesel fuel to run the irrigation pumps. The story indicated that they had been converted over to the high yielding seeds and that they were getting virtually nothing from them because they couldn't get the diesel fuel to run the pumps and water the fields. On the facing page was a full—page spread advertising the latest Evinrude outboard motors. These are the exact same engines, but in one case people were starving to death because they couldn't get the fuel to run it. What have we done? We have wedded this technology to poor nations, and then either refuse to release the fuel, or make it too expensive to buy.

Another problem that we need to address is the genetic variability of crops. What we have done over the last twenty to forty years is to develop a number of hybrid seeds. The cost of doing so has been that we must keep our technology one step ahead of natural forces at all times. Some of you might remember the corn blight of 1970. The problem seems to be that a certain type of corn was used in 1970 which was quite vulnerable to blight; it was a hybrid. The following year the seed growers went back to the natural stocks of seeds, and they produced another variety which was not vulnerable to blight; and in the years since we have not had any problems. Now, in order to develop these hybrids--or even to grow anything very well-—we must maintain a variety of seeds. This is something that this country is not doing very well. Thousands of years ago there were seeds which evolved through various processes of domestication and interbreeding. From this wide diversification of seeds we have developed a few hybrids without maintaining the genetic bank which preceded them. The United Nations published a report recently in which they concluded ——to quote one section of the report——that "The older diverse varieties and races are known no more in many areas. Many of the weedy relatives with which they maintained genetic interchange have been swept away." They pointed out that "In Afghanistan. in 1970 and 1971 crop failure made it necessary to import many thousands of tons of seeds of advanced hybrid varieties Since nothing else was to be had. As a result, in areas where crops were extremely diverse only five years ago, none of the native races of wheat are to be found." The United States has done a little work in the area of preserving natural seeds and trying to preserve some of the genetic diversity; but even then our one and only seed storage bank in Fort Collins, Colorado is operating on the same budget this year that it did in 1957. As a result, the quality and care with which seeds are normally stored has drastically declined.

Despite all this, I feel strongly that we are not here to continually discuss all the bad news in agriculture or in land use, or in the way that people get along. We need to simply understand that some of the problems that I have mentioned exist, and that our role at this conference is to

facilitate each other's understanding of our relationship t'o those problems. There are many alternatives which can produce a fruitful system and an environmentally sound system. Some of these alternatives include the use -of solar energy and wind power; others include recycling energy in natural systems and organic crop production, in which we begin to learn something from nature rather than abusing it with huge onslaughts -of chemicals. Solutions to our current agricultural problems depend on people who are willing to change, and who have the courage that it takes to fight against the forces of ease which have produced some years of great profit at the expense of our own health--and the health of our natural environment.