

The Art of Feeding Mankind: from Henry A. Wallace to the “Green Revolution”

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By Karel Vereycken, Founder Agora Erasmus, 2008.

In a powerful speech entitled “The Price of Free World Victory” delivered to the Free World Association in New York City on May 8, 1942, U.S. President Franklin Delano Roosevelt’s Vice President Henry Agard Wallace laid out his vision to bring mankind into the “Century of the Common Man.”

It stood as a sharp polemic against the anglophile pro-Morgan interests, of such folk as *Time* magazine’s Henry Luce, which had called earlier in 1941 on America to follow the model of the 19th Century’s “British Century,” and rename it the “American Century.”

America, argued Wallace, after having being freed from slavery by President Abraham Lincoln in the 19th Century, and after freeing the world of the slavery of the Nazi system at that time, had to commit itself, once the war terminated, to also free the common man from the slavery of daily want—the slavery of hunger, sickness, and social insecurity.

Wallace’s words were based on his own experience. As FDR’s Secretary of Agriculture, he had played a key role in the “New Deal” that brought the United States out of an otherwise hopeless depression, which included feeding its own people.

“Modern science,” said Wallace in his 1942 speech, “which is a by-product and an essential part of the people’s revolution, has made it technologically possible to see that all of the people of the world get enough to eat. Half in fun and half seriously, I said the other day to Madame Litvinov: ‘The object of this war is to make sure that everybody in the world has the privilege of drinking a quart of milk a day.’ She replied: ‘Yes, even half a pint.’ The peace must mean a better standard of living for the common man, not merely in the United States and England, but also in India, Russia, China, and Latin America—not merely in the United Nations, but also in Germany and Italy and Japan. »

“Some have spoken of the ‘American Century’: I say that the century on which we are entering—the century which will come out of this war—can be and must be the century of the common man. Everywhere the common man must learn to build his own industries with his own hands in a practical fashion. Everywhere the common man must learn to increase his productivity so that he and his children can eventually pay to the world community all that they have received. No nation will have the God-given right to exploit other nations. Older nations will have the privilege to help younger nations get started on the path to industrialization, but there must be neither military nor economic imperialism. The methods of the 19th Century will not work in the people’s century which is now about to begin. India, China, and Latin America have a tremendous stake in the people’s century. As their masses learn to read and write, and as they become productive mechanics, their standard of living will double and treble. Modern science, when devoted wholeheartedly to the general welfare, has in it potentialities of which we do not yet dream.”

Today, that great vision remains largely unfinished. At the beginning of the 21st Century, out of the roughly 1.43 billion farmers of this planet, the majority of them women, only 27 million (less than 2%!) have tractors, fewer than 300 million use animal labor, and close to 1 billion are enslaved to the limited resources of their own muscles. As a result, some 530 million very poor farmers compose the core of those 900 million of the world population struck with chronic hunger.

The solution for this problem is perfectly known. As we will document here, Wallace’s agricultural policies and scientific optimism define a coherent concept of the art of feeding mankind, a concept that has proven its efficiency and served as a crucial reference point for launching the “Green Revolution,” first in Mexico by Wallace himself, and then later in the early 1960s in India and Asia, and later in Africa. The same concept was also one of the sources of inspiration for De Gaulle’s and Adenauer’s 1962 Common Agricultural Policy (CAP), a policy aimed to ensure permanent peace and security through food security.

Henry Agard Wallace

Henry A. Wallace was born in Iowa on October 7, 1888. His father, Henry Cantwell Wallace, was the editor of a farm paper called *Wallaces’ Farmer* and served as Secretary of Agriculture in the Administrations of Presidents Warren G. Harding and Calvin Coolidge from 1921 until his death in 1924.

George Washington Carver, the first black teacher that Iowa State ever hired, used to take long walks into the surrounding fields to study plants for research. On some of these walks he took a little boy with him, the 6-year-old son of a friend and dairy science professor.

Carver shared his love of plants, and the boy responded enthusiastically. At the age of 11, that boy began performing experiments with various varieties of corn. His name was Henry A. Wallace, who would study plant genetics and cross-breeding in the same university under Carver.

Already then, the young Henry Wallace discovered and patented a successful strain of corn that produced a greater yield while resisting disease better than normal corn. As an adult, Wallace's fascination with corn continued. He developed some of the first hybrid corn varieties and even published his findings in his father's paper, *Wallaces' Farmer Magazine*. He also founded Pioneer Hi-Bred International, Inc.

Planting his hybrid seeds, the per acre yields of Midwestern corn doubled and even tripled. This triumph allowed the young Wallace to found his own business to manufacture and distribute the plants, a venture that gave him valuable experience for his later career in public service.

The Wallaces had traditionally been a Republican family, but the shock of the Great Depression and its impact on rural America brought Henry to shift political affiliations. Disgruntled by the Coolidge and Hoover agricultural policies, Wallace threw his support to the Democrats. In 1932, Wallace supported Franklin Roosevelt, who in turn selected Wallace as his Secretary of Agriculture.

Secretary of Agriculture

A firm supporter of government economic intervention, Wallace vigorously implemented the "controversial measures" of the Agricultural Adjustment Act (AAA), enacted on May 12, 1933. For the first time, Congress declared that it was "the policy of Congress" to balance supply and demand for farm commodities so that prices would support a decent purchasing power for farmers.

After some study, economists for the U.S. Government decided that during the time from 1909 to 1914, the prices that farmers got for their crops and livestock were roughly in balance with the prices they had to pay for goods and services they used in the production of crops and livestock and family living. In other words, a farmer's earning power was on a par with his or her purchasing power. This concept, incorporated in the AAA, was known as "parity."

Never before in peacetime had the Federal Government sought to regulate production in American farming, with government planning designed to battle the main problem of that period in U.S. farming—overproduction and low prices.

Although the stock market crash of October 1929 represents, for many, the onset of the Great Depression, the decade of the 1920s was one of depression for much of agricultural America.

World War I had severely disrupted agriculture in Europe. That turned to the advantage of farmers in the United States, who increased production dramatically and were therefore able to export surplus food to European countries. But by the 1920s, European agriculture had recovered and American farmers found it more difficult to find export markets for their

products. Production had flourished under the high prices generated by World War I. Wartime demand ended suddenly with the Armistice in 1918. The 1920s saw overproduction and declining prices. Farmers continued to produce more food than could be consumed, and prices began to fall. The loss of income meant that many farmers had difficulty paying the mortgages on their farms. Farm mortgage debt rose from \$3.2 billion in 1910 to \$9.6 billion by 1930 and brought many American farmers into serious financial difficulty. However, with the Great Depression gripping cities as well as rural areas, there were few alternatives.

Overproduction resulting from shrinking domestic and foreign markets and the sharp drop of purchasing power collapsed prices dramatically. In South Dakota, for example, the county grain elevators listed corn as minus three cents a bushel—if a farmer wanted to sell them a bushel of corn, he had to bring in three cents. Fields of cotton lay unpicked, because it could not be sold even for the price of picking. Orchards of olive trees hung full of rotting fruit. Oranges were being sold at less than the cost of production. Grain was being burned instead of coal because it was cheaper.

The AAA

Such drastic times required drastic measures, and as soon as FDR was elected, Secretary Wallace gave responsibility for drafting legislation to Mordecai Ezekiel, a senior Agriculture Department economist, and Frederic P. Lee, a Washington lawyer employed by the American Farm Bureau Federation. Roosevelt sent the draft to Congress on March 16, stating: *“I tell you frankly that it is a new and untrod path, but ... an unprecedented condition calls for the trial of a new means to rescue agriculture.”*

Congress passed the far-reaching legislation, and it was signed on May 12, 1933, as the AAA. This Act authorized production adjustment programs that were a direct outgrowth of the experience of the Federal Farm Board. It authorized the use of marketing agreements and licenses, which had been used already by producers to promote orderly marketing of perishable fruits and vegetables. Also, under authority of the AAA large quantities of surplus food were distributed via Food Stamps to needy households through and to school lunch programs.

The day after the AAA was adopted, on May 13, 1933, in a radio speech labeled “A Declaration of Interdependence,” Wallace, combining determination and great compassion, told farmers over the radio:

“In the end, we envision programs of planned land use; and we must turn our thought to this end immediately; for many thousands of refugees from urban pinch and hunger are turning, with little or no guidance, to the land. A tragic number of city families are reoccupying abandoned farms, farms on which born farmers, skilled, patient, and accustomed to doing with very little, were unable to make a go of it. In consequence of this back-flow there are now 32 million people on the farms of the United States, the greatest number ever recorded in our history. Some of those who have returned to farming will find their place there, but most of them, I fear, will not.”

He added: *“The adjustment we seek calls first of all for a mental adjustment, a willing, reversal, of driving, pioneer opportunism and ungoverned laissez-faire. The ungoverned*

push of rugged individualism perhaps had an economic justification in the days when we had all the West to surge upon and conquer; but this country has filled up now, and grown up. There are no more Indians to fight. No more land worth taking may be had for the grabbing. We must experience a change of mind and heart.”

Hence, the first goal set with the AAA was to reduce the amount of crops that farmers produced and the number of livestock sent to slaughter. Less crops and fewer animals would mean that prices for agricultural products would rise, increasing farmers' abilities to pay off debts and enhancing their purchasing power. To convince farmers to reduce production, the AAA authorized the Federal Government to pay subsidies to farmers for growing smaller crops and raising fewer animals.

In an earlier speech, “The Farm Crisis,” delivered by radio on March 10, 1933, Wallace keenly had observed that *“During the few years just preceding 1929, we were selling in foreign markets the product of roughly 60 million acres of land. The value of those exports this past fiscal year was 60% below that of 1929. We must reopen those markets, restore domestic markets, and bring about rising prices generally; or we must provide an orderly retreat for the surplus acreage, or both.”*

In “The Cotton Plow-Up,” a speech delivered on radio on August 21, 1933, Wallace defended his policy: *“On one of the largest cotton plantations in Mississippi I saw a dramatic instance of America’s present effort to catch its balance in a changed world. There were two immense fields of cotton with a road between them. On one side of the road men with mules and tractors were turning back into the earth hundreds of acres of thrifty cotton plants nearly three feet high. On the other side of the road an airplane was whipping back and forth at 90 miles an hour over the same kind of cotton and spreading a poison dust to preserve it from destruction by the boll weevil. Both of these operations were proceeding side by side on the same farm, and both in our present critical state of economic unbalance were justifiable and necessary.”*

To tackle that problem, Wallace offered hog and cotton farmers a single opportunity to improve their stagnating markets by plowing under 10 million acres of cotton and slaughtering 6 million pigs and 220,000 pregnant sows. For the losses, the government would issue relief checks totaling millions of dollars. Wallace scorned those who ridiculed his plans without considering the logic behind them, observing, *“Perhaps they think that farmers should run a sort of old-folks home for hogs.”*

After these dramatic short-term measures to curb overproduction and provoke a rapid price increase, the AAA controlled the supply of seven “basic crops”—corn, wheat, cotton, rice, peanuts, tobacco, and milk—by offering payments to farmers in return for taking some of their land out of farming and not planting a crop.

Although it earned Wallace the nickname *“The Greatest Butcher in Christendom,”* the program essentially worked, and the market experienced a 50% rise in prices.

Meanwhile, FDR’s New Deal banking reforms and industrial renaissance increased the population’s overall purchasing power and former agricultural workers found productive jobs in industry and great infrastructure construction programs. Dams and rural

electrification gave farmers the means to modernize production and access to fertilizer and irrigation.

Today's Problem

Today, we are obviously not at all in the same situation as FDR was in 1933, but the same principles are at stake. Over the past two decades, globalized free trade and partisan deregulation, combined with reductions of subsidies and inventories, have driven world food prices down while reducing many nations' population's living standard and buying power.

Already in itself, the "world food price" is by itself a fraud. For example, if today's world cereals production is close to 2 billion tons, only 200 million tons (10%) are traded on the world market, while that "world price" becomes the price of reference for the remaining 90%. And of those 200 million tons, 80% are traded by only three giant agro-cartels—Cargill (U.S.), Archer Daniel Midland (U.S.), and Louis Dreyfus (France).

Correctly identified in the early 1920s and 1930s by Wallace's advisor Mordecai Ezekiel as the "inelasticity" of the food and agriculture market, a small discontinuity (e.g., drought, catastrophe) in the supply or demand of food and agricultural products, if unregulated, is sufficient to provoke major price instabilities.

Hence feeding the planet is a time needing process. While financial speculation prospers by "surfing" on rapid shifts of commodity prices, food security, as a policy, is uniquely based on stability, because a price too low prevents farmers from planning and investing in tomorrow's production, while a price too high destroys the population's access to food, both in quantity and quality.

The success of FDR's New Deal and Wallace's AAA established a valid and proven model that was as far distant from Soviet-style totalitarian regulation as it was from British free trade looting and, as such, became a model for the post-war reconstruction period.

It only required for something that the Anglo-Dutch financier cartels hate the most—governments that govern, rather than being mere tools of some kind of special interests.

Norman Borlaug and the "Green Revolution"



Several weeks ago, Helga Zepp-LaRouche called for a "new Green Revolution" to solve the world's food crisis.

What are we talking about?

What used to be understood as the "Green Revolution" (before the Malthusian greenies arrived) refers to a great scientific and economic mobilization that took place in India, a country six times larger than France and populated by more than 1 billion people, when a basic form of food self-sufficiency was attained, a goal achieved in the domain of rice and wheat in the extraordinarily short period of about 15 years.

As a result, India's wheat production increased from 12 million tons per year in the 1970s to 70 million tons today. The "Green Revolution" got started in India, when in May 1962, M.S. Swaminathan, later an advisor to Indira Gandhi, invited to India the American agronomist Norman Borlaug to bring the "Green Revolution" from Mexico to India.

Born on March 25, 1914 and raised in Cresco, Iowa, Norman Ernest Borlaug worked as an adolescent on his father's farm in Iowa, the state of Henry Wallace. Later he specialized in agronomy and genetics and was awarded the Nobel Peace prize in 1970 for his development of high-yielding wheat. According to Borlaug, one of his motivations derived from the shock he experienced in 1935 upon discovering the effects of rampant malnutrition among youth when he was leading a group of the Civilian Conservation Corps (CCC), a program designed by FDR to bring young Americans back into some kind of organized working practice. During the war, Borlaug's laboratory would work, as many did, for the war effort.

After the election of 1940, Wallace took a vacation trip to Mexico. There he found the yield of corn, an important part of most Mexican families' diet, to be much lower than that of American farmers that planted hybrid corn varieties.

Wallace had an idea to create agriculture experimental stations like those in Iowa. The stations would develop improved corn varieties adapted for the climate and soil of Mexico. On his return to the United States, he proposed the idea to the Rockefeller Foundation and convinced them this was in the "strategic interest" of the United States. The decision was made to help the Camacho administration to increase substantially Mexico's agricultural output and an experimental station was built. To achieve that goal, Borlaug, as many others, was called on to join the effort. After finishing the war, working a well-paid job at Dupont, and leaving temporarily behind his pregnant wife, Borlaug flew to Mexico to join the station started by Wallace.

By studying the agronomic conditions of the region, Borlaug and his team realized they could speed up breeding by taking advantage of Mexico's two growing seasons. Building on frequent travels in the region to exchange ideas and results on experiments, Borlaug helped to set up a network of agricultural scientists later to become the International Maize and Wheat Improvement Center (Centro Internacional de Mejoramiento de Maiz y Trigo [CIMMYT]).

Borlaug's plan encountered massive opposition from his patrons, and only after a big battle in which he threatened to resign did he get the green light to go ahead. In the summer he bred wheat in the central highlands as usual, then immediately took the seeds north to the Yaqui Valley research station near Ciudad Obregon, Sonora. The difference in altitudes and temperatures allowed more crops to be grown each year. Besides the extra cost of doubling the work, Borlaug's plan went against a then-held principle of agronomy that has since been disproved. It was believed that seeds needed a rest period after harvesting, in order to store energy for germination before being planted. As of 1945, wheat would then be bred at locations 700 miles (1,000 km) apart, 10 degrees apart in latitude, and 8,500 feet (2,600 m) apart in altitude. This was called "shuttle breeding."

As had Wallace, Borlaug was interested in improving plant varieties. One of his specialties was “dwarfing.” While taller wheat grasses better compete for sunlight but tend to collapse under the weight of larger seed heads—a trait called “lodging”—dwarf plants produce thick stems and do not lodge. In 1953, Borlaug acquired a Japanese dwarf variety of wheat that had been crossed with a high-yielding American wheat variety. Borlaug cross-bred this variety with disease resistant cultivars to produce wheat varieties adapted to tropical and sub-tropical climate areas. Borlaug’s new semi-dwarf, disease-resistant varieties changed the potential yield of spring wheat dramatically. By 1963, 95% of Mexico’s wheat crops used the semi-dwarf varieties developed by Borlaug. That year, the wheat harvest was six times larger than in 1944, the year Borlaug arrived in Mexico. Corn production had doubled, and Mexico had become fully self-sufficient in wheat production and a net exporter of wheat.

From Mexico to India

The governments and elites of the world and especially in Asia had followed hour by hour these developments. As we said before, under the impulsion of M.S. Swaminathan, Borlaug’s contributions were mobilized for India. Swaminathan especially succeeded in convincing the Indian minister Subramanian to import the high-yield seeds from Mexico, even if their prices were twice as high as the Indian seeds. After achieving major progress for wheat, Borlaug then focused his energy to ameliorate problems facing another cereal—rice. The improvement of the Indian rice production was undertaken simultaneously in the entire region and supported by the International Rice Research Institute (IRRI) based in the Philippines.

All these successes brought William Gaud, the head of the U.S. Agency for International Development (USAID), to declare in 1968: “These and other developments in the field of agriculture contain the makings of a new revolution. It is not a violent Red Revolution like that of the Soviets, nor is it a White Revolution like that of the Shah of Iran. I call it the Green Revolution.”

But the “Green Revolution” would never have become green without the following ingredients, defined as a single “technological as well as political package.”

First, the three “technologies” to be mobilized were:

- **High-yield seeds**, such as those developed for wheat and corn in Mexico and rice in Asia.
- **Fertilizers and pesticides**, which India would initially import before setting up its own production.
- **Irrigation**. India started its first rice program in regions already steeped in the tradition of irrigation, such as the Punjab. Irrigated farmland was tripled between 1950 and 1996. The water used for irrigation in both Mexico and India is paid for by the state, and prices of electricity for operating pumps have been close to zero or moderate till recently.

The French agronomist and economist Michel Griffon, in his book “Nourrir la planète” (*Feeding the planet*), emphasizes that the Green Revolution cannot be merely reduced to a simple set of scientific techniques, such as those represented by high-yield seeds, but

consists of a global, state-regulated agricultural policy akin to FDR's and Wallace's New Deal.

Griffon writes: *"For M.S. Swaminathan, what was first called the wheat revolution in 1968, was in reality at the same time a technology as well as measures, such as rural electrification to pump ground water, the creation of an agricultural commission capable to recommend efficient prices, the creation of the Food Corporation of India to buy the wheat of the producers at prices dictated by the state, and the creation of the National Seed Corporation to produce high-yield seed varieties...."*

"To be even more precise, the economic model that went along with the green revolution, and similar revolutions that spread over Asia and the world, was characterized by the following basic measures:

- *The producer has the guarantee that his harvest will be bought.*
- *The producer has the guarantee of the price of his harvest before production.*
- *Subsidies for fertilizer and seeds.*
- *Subsidized loans of agriculture credit for the yearly purchases and equipment, such as irrigation pumps and tillage equipment.*
- *Free training and vulgarization of knowledge."*

"This voluntaristic policy," writes Griffon, "is not very different than the policy which was applied and still is applied by Western nations in the same period. The Marshall Plan that was partly set up to overcome food shortages in the post-war period and the policies of General McArthur in Japan to rebuild the economy were based on the same massive effort combining a new technology and aid measures highly stimulating. The same principles also inspired during the same period the French agricultural policy and then the Common Agricultural Policy (CAP)."

The "White" and "Yellow" Revolutions

In India, the "Green Revolution" was followed by the "White Revolution"—the revolution of producing milk. In 1968, India created the National Dairy Development Board (NDDB) to broaden the creation of milk cooperatives, more efficient than state-run milk collection. In 10 years, 13,000 milk cooperatives were set up and their number reached 95,000 in 1995. The cooperatives also assisted the upgrading of production through providing veterinary services, animal feed, artificial insemination, and cross-breeding with high-producing dairy cows such as the Holstein variety.

Between 1970 and 1985, milk production was doubled, nearly entirely to the benefit of very small farmers, 70% of them having fewer than two cows. Today, India is the biggest milk producer in the world and 70 million families live from the dairy sector.

To produce milk, you need cows. But to produce cows, you need animal feed.

Consequently, as a spin-off of the "White Revolution," emerged the "Yellow revolution," and the NDDB, flush with its success, was called on to accomplish the same effort for the oleaginous production capable to grow animal feed and start the production of edible oil.

Griffon: *“The NDDB undertook massive market interventions using three means: it bought up foreign imports, it bought up production on local markets when production was abundant, and organized delivery centers for the edible oil industry. The result was a lowering of imports, price stabilization, and a stimulation of demand and the development of local production. As early as the 1990s, national production was increased, increasing from about 10 million tons to close to 25 million tons.”*

The total cumulative effect of the “Green,” “White,” and “Yellow” revolutions gave India the opportunity to effect a “food transition”—as do all nations that develop—from a diet based on roots and dry vegetables to cereals, and from cereals to animal protein complemented with fresh fruits and vegetables.

Who Killed the Green Revolution?

Of course, every solution applied by man creates new types of interesting problems and only a policy of permanent discovery of new physical principles can sustain permanent economic and demographic growth. For example, intensive irrigation using slightly salty water will cover any farmland over a longer period with a thin crust of salt. Modern science and technology can tackle such a problem overnight, and only sick minded environmentalists or Stone Age Malthusians would call for scrapping irrigation totally.

In reality, the real reason why yields and productivity have not continued rising over the past decades, is not because of Green Revolution policies, but because these policies were dismantled and key components were scrapped, especially for the sake of the policies imposed by international financial institutions such as the International Monetary Fund (IMF) and World Bank. The trilogy of stabilization, adjustment, and liberalization was the crux of these anti-Green Revolution policies. These three soldiers of the Apocalypse have dismantled the public agriculture sectors that were developing, as much as possible, and with all their problems, out of the Green Revolution.

Griffon observes that “In each country, [Green Revolution] development resulted in a process very rationally laid out, bringing into being a group of institutions and economic circuits necessary for the Green Revolution and regional development.” In short, the Green Revolution developed political nation-states.

Hence, the global empire of Anglo-Dutch financial globalization is not ready to tolerate the formation of even the shadow of a nation-state. Therefore, regulated farming had to be destroyed, and in name of the “Washington Consensus,” public budgets were slashed and often eliminated in the early 1990s, provoking several countries to return to hunger and food insecurity. If before the breakdown of the Soviet Union nations were partly allowed to feed themselves for not falling into the hands of a communist rival empire, they were not any longer allowed to do so afterwards.

Can a New Green Revolution Succeed Again Today?

In terms of new technologies, many promising leads exist already and yields and productivity can still be increased. Even if this author is not aware to what extent the following discoveries have been translated into common practice, it is interesting to note

that in 1997, the Population report of Johns Hopkins University indicated the following three promising leads to increase world food production:

Super Rice. The International Rice Research Institute of the Philippines has developed a new variety of rice capable of a 25% yield increase, which represents an extra 100 million tons of rice per year, or the required volume to feed 450 million people. The variety so far seems to perform well only on highly irrigated farmland.

Maize. Wallace's and Borlaug's CIMMYT of Mexico has developed several varieties of maize that could increase yields another 40%. These varieties could be cultivated on marginal farmland and would be especially useful for poor farmers. If these varieties were broadly used, an estimated extra 50 million people can be fed each year.

Potato. The International Potato Center headquartered in Lima, Peru, claims that if the required \$25 million were invested, the Center can produce a new variety of potato capable of resisting severe diseases rampant on many continents.

M.S. Swaminathan has called for a "double" Green Revolution, meaning that today's scientific knowledge gives us more responsibilities today than in the 1960s. For him, the issue is not just raising productivity and yields at all costs, but to cooperate with the biosphere, because the neo-liberal economic free trade policies end up looting both man and the creative potentialities of the biosphere.

Soil erosion can be overcome by better water management, alternating production, water desalination with nuclear energy, and a more targeted use of fertilizer and pesticides.

Without falling into the trap of green pessimism, American economist Lyndon LaRouche has emphasized that man cannot just "eliminate" all the "unproductive" varieties of plants and animals we have around us for the mere reason that we do not have yet the science to use their vast potential. The decrease of biodiversity equally decreases the chances of mankind to find its resources for survival, argues LaRouche. The science of cross-breeding and genetic modification, if taken out of the hands of mega financiers and political "big brothers," will continue to help mankind to develop.