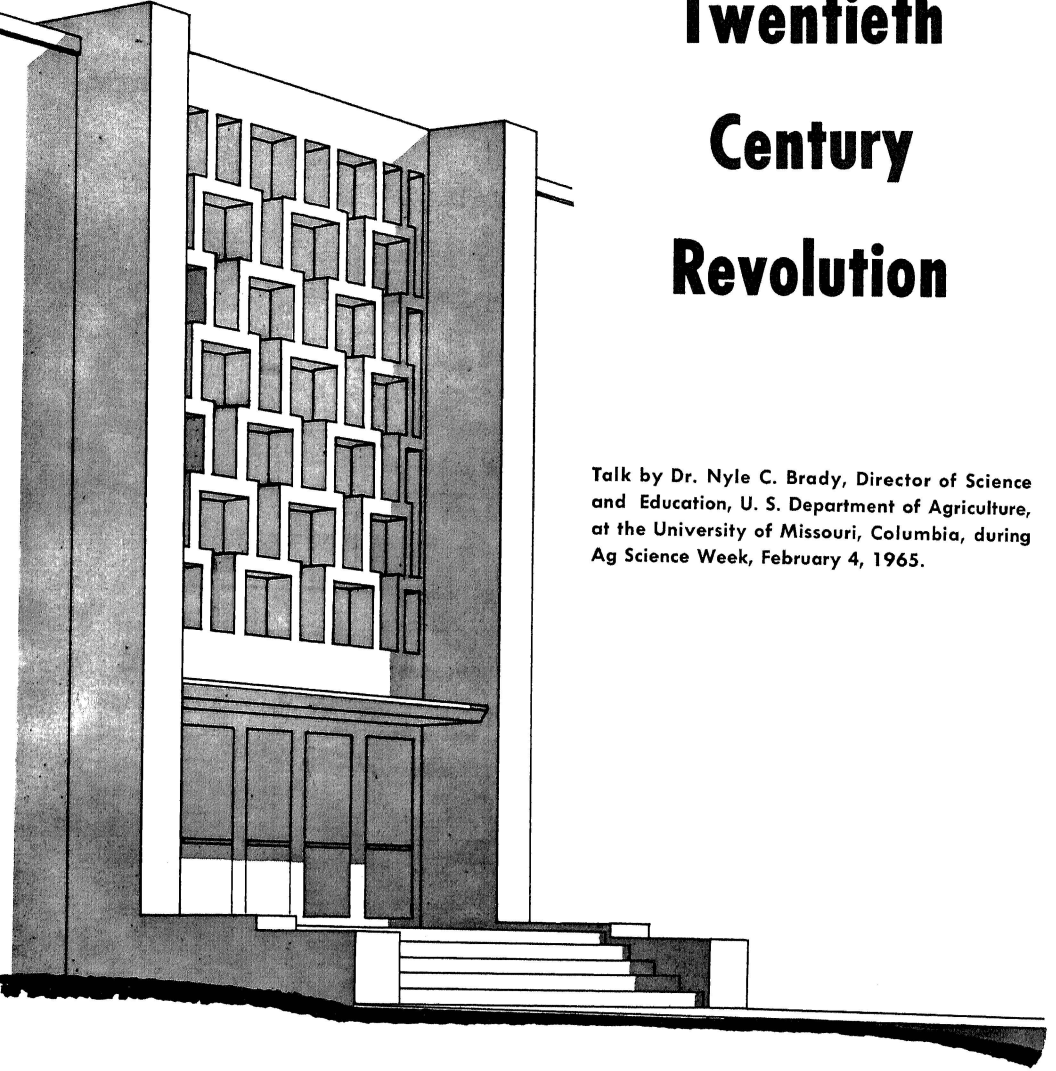


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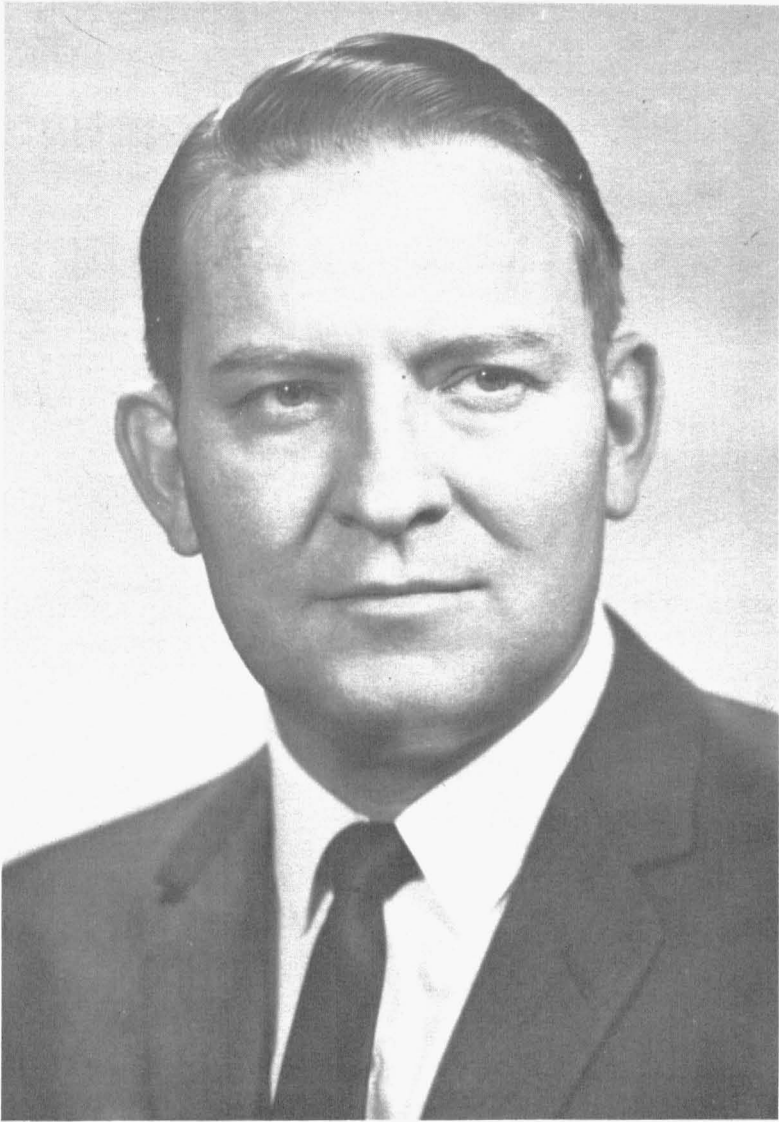


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Dr. Nyle C. Brady

# America's Twentieth Century Revolution

*Talk by Dr. Nyle C. Brady, Director of Science and Education, U. S. Department of Agriculture, at the University of Missouri, Columbia, during Ag Science Week, February 4, 1965.*

The upheavals in American life during this century have left no area of our lives untouched. If a minister or a manufacturer or a doctor were in my place today, each would have a different story to tell about America's twentieth century revolution. It is the changes in American agriculture, however, that I want to talk about, and particularly those of the last 25 years.

It certainly isn't news to anybody that these changes have produced a revolution-- probably the most significant one of the century. Perhaps those of us who are caught in the midst of it need to back off occasionally and see just where we stand in relation to this continuing and fast-moving phenomenon.

It was the violence of World War II that catapulted American agriculture into its present era of fantastic abundance. Before then, the long depression and drouth of the 1930's had kept many new discoveries and ideas from being put to full use.

When war came, however, quick answers to new problems, and better solutions for old ones, were demanded of scientists, and they repoded with breakthroughs in research. Despite reduced supplies of labor and materials, farmers combined improved methods to feed 50 million more people. This production increase was the finest testimonial to the great Federal-State program of research and education that history has produced.

This break with the past was unprecedented and irrevocable. Its revolutionary momentum has increased each year, and each of us has felt its impact. Let us define and evaluate its changes as they affect America today.

Revolution, as I define it, is a process of rapid-- if not violent-- change in concepts, ideas, and attitudes . . . in impact on society . . . in operational procedures . . . in organizations and institutions . . . and in leadership.

Let's look first at the changes in concepts and ideas about agriculture, and attitudes toward it. For one thing, the scope of activity encompassed by the term "agriculture" has broadened as our society has become more complex. Agriculture once meant farming and ranching . . . period. In the public mind, it did not include those who serve the farmer, those who process and market his goods, or those who live but do not work in the country.

Today it does. Though the numbers of farmers are shrinking, farming is still the Nation's biggest industry. And the larger complex we sometimes call "agribusiness" is a \$100 billion industry employing more than a third of the Nation's work force. We need to establish this concept even more firmly in the minds of the general public-- the people who are responsible for supporting agricultural programs.

Another concept that has emerged slowly, through conflict and struggle, is that agriculture is entitled to receive its fair share in the market place. Just how this is to be accomplished is perhaps agriculture's most debated subject. But I believe the public is convinced that a farmer should receive more than the \$1.05 an hour he now averages while a factory worker is earning \$2.46.

America has realized, too, that farming is more than a way of life. It is a modern business dependent on science, technology, education, and economics. A farmer who is not a good business man can probably "hit bottom" quicker and more disastrously now than ever before.

There has also been a change in agriculture's relationship with the consuming public. It is more intimate, and more demanding, than ever before.

The safety and purity of the Nation's food and the fertility of its soils have always been entrusted to agriculture. Now, as our population grows and becomes more urban, it is largely agriculture that must keep our whole ecology healthy. Farmers must look beyond selfish interests to see that water and wildlife resources are developed to benefit everyone. If city dwellers need outdoor recreation more than they do additional farm products, farmers must put the land to new uses. Agriculture -- more than any other segment of America -- must help to safeguard the right of every citizen to elbow room, to green and open areas, and to the beauty of lakes and streams and forests before it is too late.

Another measure of the importance of the changes in agriculture is their impact on society. Because farmers have maintained and increased their efficiency, the average family in this country spends less than a fifth of its income for food. In other countries, families spend a third, or a half, or even more.

While the chunk of the family's income that goes for food has been decreasing, the number of persons that one farmer can feed has been spiraling upward, so that today an American farmer produces enough farm products to supply 31 people. Never in history have so few fed so many.

This means that 30 people out of every 31 are not tied to the land to produce food and fiber for themselves. They are free to provide the goods and services that make up our standard of living. . . free to become doctors, teachers, scientists, or bus drivers.

These are the benefits of the vast release of manpower from agriculture. There's another side.

The chief losers have been some of our rural residents -- victims of a revolution in efficiency they were unable to join and powerless to stop. We have responsibilities to help people forced out of farm employment by the march of technology. Some workers can be retrained for other jobs, but some are untrainable. Society must aid them.

This impact on society, fortunate for consumers but catastrophic for some rural families, is due to drastic changes in another broad area -- operational procedures. I need not catalog the technological advances, because most of us have watched at least some of them take place. If farmers had to operate now as they did in 1940, our food and fiber would cost about \$17 billion a year more to produce. And there'd be a fantastic amount of manual labor involved.

When I was growing up in Colorado, it took a lot of shoveling to get corn loaded onto a truck. When I go back home now and see the way my brother grows corn. . . picking and loading it mechanically. . . substituting chemical and mechanical energy for manual labor. . . it makes me a little envious.

Business management, like production and marketing technology, has so changed. Now any farmer worth his salt has a good bookkeeping system, and some use computers to analyze the soundness of their business enterprises. Our fewer and larger farms have more integrated business operations, greater dependence on services from off the farm, and increased capital requirements. Where a farm's assets averaged \$6,300 in 1940, they came to almost \$55,000 in 1964. Successful farming is now big business and requires a good business man at its head.

I'd like to touch next on the effect of all these ideological, social, and technological changes on agricultural organizations and institutions. For one thing, the institutions are larger and more complex. The kinds of organizations have increased, and so has membership in special interest groups. And, like farms, some organizations have become fewer but larger.

For example, farmer cooperatives have declined in numbers and grown in size. Farmers today have a combined investment of more than \$5 billion in cooperatives. These organizations are securing influence in the marketplace for farmers--the advantages of big business. At the same time, they perpetuate the values of small enterprise and its opportunities for individual expression and satisfaction, thus helping to maintain and strengthen the family farm.

Cooperatives will play an important part in newly organized efforts to combat the poverty of some rural areas -- the poverty that looms so bleakly against the backdrop of our national prosperity and advanced farm technology. The national rural areas development program that the U.S. Department of Agriculture inaugurated just a few years ago has been broadened and expanded. It recognizes -- and seeks to alleviate -- the difficult personal and community problems that the revolution in agriculture has brought to thousands.

Missouri is to be commended for the aggressive role it has taken in rural areas development. Your governor has named the University of Missouri Extension Service as the technical assistance agency for helping communities develop their own action programs under the Office of Economic Opportunity. The work that is now under way in Ripley County, and that being planned for the Douglas County area, should give other communities guidelines for self-help.

This reach of extension education, which goes far beyond farming and homemaking, is largely a development of this generation.

Missouri's pioneering move to mesh its university extension education with cooperative agricultural extension work should be most helpful as you deal with these broader problems. A number of States are following Missouri's lead.

Extension's commitment to work with the disadvantaged is also receiving fresh emphasis, and I think farmers realize that this is one of the greatest helps extension can give. Even when viewed from a selfish angle, it is a drawback to successful farmers to have rural poor nearby. The unskilled may provide cheap labor, but they contribute little to communities, schools, or roads, or to the adequate development of rural resources. And their more prosperous neighbors have to foot the welfare bills.

Changing the condition of the insolvent may mean helping them to get into other regions where they can make a decent living. Unless these people are trained for other jobs, however, they may carry poverty along with them. The roots of many a city slum reach back into neglected pockets of rural poverty.

Such slums are a challenge to extension, which has begun to work with the lowest-income groups in some cities as well as in the country. Since work in city slums is new to us, we are carrying on research in several urban areas to learn how to go about it.

For example, home economists from the Cooperative Extension Service are making a survey in a low-income area of St. Louis, and the Ford Foundation is helping them in a similar area of Kansas City. The homemakers' situations and needs are first identified; then an educational program is carried on. The results will be measured by follow-up surveys. Here is one of the extremely simple booklets designed for such homemakers; they really read and use such material. Work in other cities indicates that we can do a great deal to help poorly educated and deprived families -- many of them middle-aged and older -- to help themselves.

The exploration of such new fields points up the changing role of the county agent. While we will probably always need generalists in the extension structure, more and more agents need to be specialists. An increasing number of agents are taking training beyond the bachelor's degree level, often in economics, business management, and the social sciences.

Such changes within agriculture and the broader changes in the Nation and the world are profoundly influencing the land-grant universities and particularly their agricultural colleges. Much discussion and experimentation have been fomented, and the results are showing. For the past few years, agricultural college enrollment has been increasing after a decade of decline.

As you know, over the past ten years or so, agricultural schools have revised their curricula sharply to erase the image of the old "cow college." Larger doses of the humanities and of economics, statistics, and accounting are required. The stress is now on basic disciplines, rather than on the how-to-do-it instruction that was practical when farming was simpler.

In the sciences there is less emphasis on current animal husbandry practices and more on chemistry, physiology, and genetics. There's more on nutrition and less on how to figure livestock rations. . . more on physics and less on how to put farm machinery together.

All this adds up to an emphasis on education rather than training. Basic knowledge is less likely to become obsolete as technology changes. It has been said that a student is not educated when he completes college -- he has merely acquired the tools with which he can educate himself.

Along with curricula improvements has come a rise in the level of learning. The picture has changed so much since I was in college that I'd hate to have to start over again. In agriculture, enrollment at the graduate level -- unlike undergraduate study -- has steadily increased since the war. New courses and new fields of study are being developed. Honors programs have come to agriculture, and research flourishes as never before.

Part of this is due to organizational changes that have taken place in the land-grant universities. Many States have expanded the scope of the agricultural colleges beyond conventional disciplines to bring in some of the broader sciences: for example, some have become colleges of agriculture and biological or life sciences.

Coordinating units -- sometimes designated as institutes -- have also appeared in many States. They usually bring individuals together for program planning in one broad area -- such as water resources or nutrition -- without pulling them out of their own organizational units.

Such moves are integrating agricultural sciences more firmly than ever into the universities. They are helping to offset the loss of drawing power that strictly agricultural colleges have experienced, and are utilizing their facilities more fully.

The last change I want to mention -- our changing leadership -- has sparked or directed the other advances we have discussed. I believe that the improved quality of our leadership has filtered into every aspect of agriculture.

For one thing, the vision of our leaders is not as limited as it has sometimes been in the past, and their outlook is not as provincial. Our sophisticated farmers are well aware of what the European Common Market or the Russian wheat crop means of our food exports. Agricultural leaders must be even more knowledgeable about our exports of scientific know-how to developing nations, and the looming demands of hungry people.

The education and training that leadership requires are better and more available than ever before. A vital part of this education comes through planned teamwork with other scientists and educators, and through the give-and-take that international exchanges have brought about.

When we look into the future, we can see only an acceleration of the forces that are already at work. If tomorrow's swelling populations are to be fed economically, we must have research of the highest order . . . research in the agricultural sciences, and perhaps even more in the social sciences. Farmers, scientists, and educators must become increasingly expert in their fields, and these fields will become more specialized as time goes on.

On the other hand, the economic gap between those who make farming pay and the untrained rural poor will widen unless we work fast to raise the whole level of education and opportunity in areas of rural poverty.

These growing extremes in agriculture comprise only one of the many challenges that the land-grant colleges face.

To meet these challenges, I believe these institutions must stress education -- rather than training -- even more than they do today. The most important tool they can furnish a student is to develop a broad base for learning and a desire for more. If all a student wants out of college is a job, he will probably stop learning the day he leaves school. This attitude is fatal. Education needs to prepare students for jobs that don't even exist today.

Another phase of education that will be even more important tomorrow is planned reorientation. In research, we estimate that an agricultural scientist's training in his major field is out of date ten years after his graduation . . . if he does not keep abreast of new developments.

The obsolescence rate is accelerating in most other fields too. People in many disciplines will therefore look to the land-grant universities for leadership in supplying our growing needs for reorientation.

In the future, people must have no reason to assume that the study of agriculture is second-rate in either course content or the caliber of its students. As I have said, this concept, along with the assumption that top-flight students will choose other fields, is changing, but in the future it must

change still more rapidly. It will change as rural education improves . . . as more students go to good consolidated schools and enter universities as well prepared as their city cousins.

If the land-grant institutions are to train our future agricultural leaders adequately, they must pay as much attention to the problems that revolution has caused -- the problems of rural poverty, of continuous adjustment to economic and social changes -- as they pay to the potentials for a better life that the revolution offers.

At President Lyndon B. Johnson's inaugural two weeks ago, he summed up both the problems and the potentials of the revolution of abundance when he said:

"In a land of great wealth, families must not live in hopeless poverty.

"In a land rich in harvest, children just must not go hungry.

. . . .

"No longer need capitalist and worker, farmer and clerk, city and countryside, struggle to divide our bounty. By working shoulder to shoulder together, we can increase the share of all."