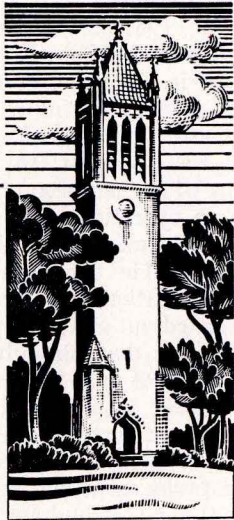


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1957

A Basebook for Agricultural Adjustment in Iowa

PART I—AGRICULTURE IN THE MID-FIFTIES



- Cooperative Extension Service in
Agriculture and Home Economics,
- Agricultural and Home Economics
Experiment Station,
- Center for Agricultural Adjustment,
cooperating

SPECIAL REPORT No. 20

Iowa State College

Ames, Iowa

October 1957

FOREWORD

Many people were puzzled when farm incomes began to drop in 1953. Agriculture had been in trouble before, but, usually, it was not alone with its problems; other parts of the economy were suffering also. In 1953, however, the general national economy was growing, and it has continued to progress since. Agriculture has remained in trouble. Why? Some of the reasons have been reasonably clear. Others have been more complex, and things have occurred which have tended to obscure what was happening as well as its causes.

The first generally recognized symptoms that something was wrong in agriculture became apparent in 1948-49 following World War II. Some of the clues were there even 20 years before—though almost immediately obscured in a general depression—and again about 10 years later. In this last instance, the entire economy was emerging from a depression. World War II served to overcome the economic problems then—both for agriculture and the nation as a whole. Agriculture's slogan was, "Food will win the war and write the peace," and agriculture's contribution was unprecedented. Patriotic urge plus higher farm prices because of increased demands for food spurred farm production to heights never before achieved.

Demand for American farm products continued unusually high following World War II as the war-torn nations sought to regain their feet. Export demand slumped temporarily in 1947-48—with a larger slump in "food" exports in 1950. American agriculture—geared to the higher production needs—couldn't dampen itself overnight, and the "surplus problem" once again reared its head. Continuation of price supports at or above wartime levels encouraged a continuation of wartime production—"the dollar was there to get" on supported items.

The Korean conflict, like World War II, provided a temporary "solution" and again obscured the over-all agricultural picture. But by 1953, "the farm problem" began to take shape again—surpluses, lower farm prices, lower farm incomes, higher farm costs.

Since then, by pieces and parts, the over-all picture has become more clear—not completely so, there are still gaps where more information is needed. But increasing evidence indicated that agriculture was out of adjustment with the rest of the national economy; resources elsewhere in the economy were earning increasing returns while returns to resources in agriculture were de-

creasing. Though the national economy as a whole was growing, agriculture was not sharing fully in the fruits of a progressive economy.

The "shocker" came in 1955. Net farm incomes dropped sharply. Hog prices in the Corn Belt, for example, fell to 10 cents a pound in December of 1955.

The farm economy was sagging during a period of a relatively prosperous and growing national economy.

By the fall of 1956, it was apparent that neither the government farm programs which had been operating, the drouth nor other factors in operation were sufficient to counteract, to stabilize or this time even to obscure what was happening in agriculture. The trouble was obvious; all of its causes and complex relationships were not; there was no one factor to be singled out as the culprit, past or present. It was obvious also that agriculture needed help. But what kind of help—not only for the immediate present but also for the future?

Members of the entire Iowa Extension Service staff met in Ames late in 1956 to focus attention on and to discuss the prospects and problems facing agriculture in the years ahead. During the winter and spring of 1957, the Division of Agriculture at Iowa State College conducted a series of seminars on the situation. Staff members of the various departments of the Division presented and discussed the evidence and data available and developed tentative recommendations and conclusions.

Following the series of seminars, the information that had been presented and discussed was considered as a whole by a basebook committee. Those who had presented material at the seminars were asked to revise, to shorten and to update their material in the light of all information presented at the seminars and of any new information available.

The Basebook for Agricultural Adjustment in Iowa thus represents both a synthesis and a summary of the relevant information we now have available as well as the tentative conclusions and recommendations based thereon. Just as this brief foreword cannot give a complete picture of the situation, neither can all three parts of the basebook furnish a complete view; information in some areas is far from complete.

Largely because of this and partly as an outgrowth of the series of seminars, a Center for Agricultural Adjustment has been established within the Division of Agriculture at Iowa State College to seek and coordinate and

to apply and extend both basic and practical information in the areas where present knowledge is inadequate. Meanwhile, the primary purpose of this basebook is to provide as brief but complete a picture as is now possible of: (1) the current situation and its background; (2) the prospects for agriculture in the immediate decades ahead; and (3) alternative possibilities and means for working toward solutions of the problems and for facilitating those adjustments in agriculture that appear to be

necessary to assure a healthy agriculture in the years ahead.

Originally this basebook was envisaged primarily as a "handbook" of background information for the Divisional staff in research, resident teaching and extension. It is being made available now, however, to others interested in understanding the problems of and needs for agricultural adjustment. Less technical and detailed presentations will also be made available for wider use.

Floyd Andre
Dean and Director
Division of Agriculture

Marvin A. Anderson
Associate Director
Extension Service

George M. Browning
Associate Director
Experiment Station

Roy M. Kottman
Associate Dean
Resident Teaching

PREFACE TO PART I

Agriculture is a unique industry—made up of millions of individual firms, each an individual business with its own manager. Many of these also are basically family and living units. The physical products of agriculture are used primarily for food and direct human consumption, and many are necessary for life itself. Once these needs are met, however, other uses for the products of agriculture that will yield favorable prices to farmers seem limited. These and other unique characteristics of agriculture cause it to be beset with problems not encountered by all industries.

Problems often arise in agriculture even when the national economy is growing. National income has been rising at about 5 percent annually in recent years. Agricultural income has been falling. If capital investment in farming is charged at market rates of interest, it's apparent that many farm operators are not well paid for their efforts. The agricultural situation isn't one which has just developed, however. The need for a better balance was already evident in the 1920's. After that, the depression, international situations and wars or conflicts came along to obscure the basic picture. Now, the situation is back with us—and with increased intensity. The agricultural economy is depressed at a time when national incomes and living standards are at record levels.

The purpose of Part I of this basebook, "Agriculture in the Mid-Fifties," is to summarize the current situation and to explain its background and the basic causes of "the farm problem" in the light of information now available. It traces the trends which have taken place in

the income and resources of agriculture. It explains how agriculture has contributed to economic progress as well as the types of adjustments which progress requires. It deals with agriculture's capacity to adjust and with some of the social and educational implications.

Understanding of the forces behind the farm problems is necessary if farm people and society are to understand (1) the current situation, (2) the adjustments needed to improve it and (3) the alternative means or opportunities for making progress in these adjustments.

This publication is the first of a series of three bulletins summarizing the information presented and discussed at the Agricultural Adjustment Seminar conducted by the Division of Agriculture at Iowa State College. Part II will be concerned with the prospects for agriculture in the years immediately ahead—demand and supply for farm products as a whole and for individual commodities—and will explain more fully the types of adjustments needed. Part III will analyze the role of past and present farm programs as they have affected and are affecting agriculture; it will suggest ways in which they might be improved; it will present some of the opportunities for adjustment—opportunities for individual families, for groups and organizations, and for society as a whole.

Earl O. Heady, Chairman
Agricultural Adjustment
Seminar

John F. Heer, Chairman
Agricultural Adjustment
Basebook Committee

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Agricultural and Home Economics Experiment Station, Iowa State College of Agriculture and Mechanic Arts, Floyd Andre, Director, Ames, Iowa.

Cooperative Extension Service in Agriculture and Home Economics, Iowa State College of Agriculture and Mechanic Arts and the United States Department of Agriculture cooperating. Floyd Andre, director, Ames, Iowa. Distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914.

The Current Situation in Agriculture

BY FRANCIS A. KUTISH

FOOD WILL WIN the war and write the peace! This slogan was heard often during the war period. Patriotic urge plus higher prices (which in turn stemmed from increased food needs) brought forth a sharp boost in farm output during the early war period (see fig. 1). This output has continued to expand, despite the loss of some of the wartime and early postwar special demand outlets. In turn, farm incomes have dropped.

The boost in farm output was accomplished by a rapid adoption of new technology, increased use of capital and more intensive use of land and labor (see fig. 2). There

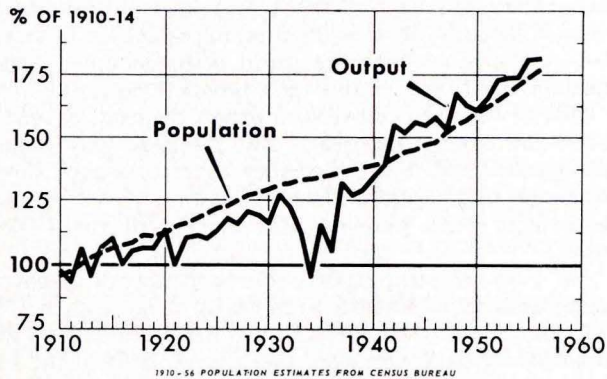
was an actual drop in total number of workers on farms.

Total cropland harvested increased from 339 million acres in 1940 to 361 million acres in 1944, as grassland was plowed up to put into crops. Between 1944 and 1949, harvested crop acres fluctuated between this figure and 351 million acres. Crop acreage declined in the early 1950's and in 1955 was down to 340 million acres—or about the same as in 1940 (see fig. 3).

Farm output per man-hour worked rose steadily from an index of 69 (1947-49 = 100) in 1940 to 104 by 1949 (see fig. 4). Man-hours of farm work dropped from an index of 120 (1947-49 = 100) in 1940 to 97 in 1949.

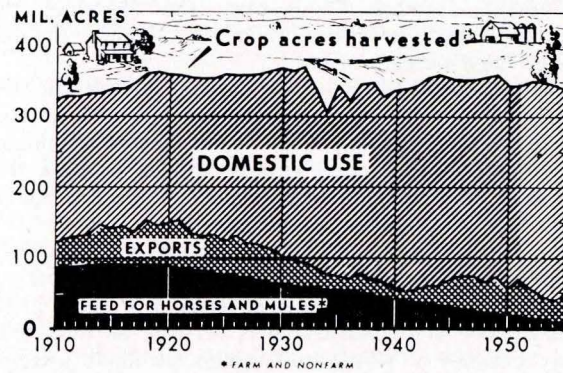
Use of fertilizer increased from an index of 48 in 1940 (1947-49 = 100) to 105 in 1949. Before 1940 most of

FRANCIS A. KUTISH is professor of agricultural economics, Department of Economics and Sociology.



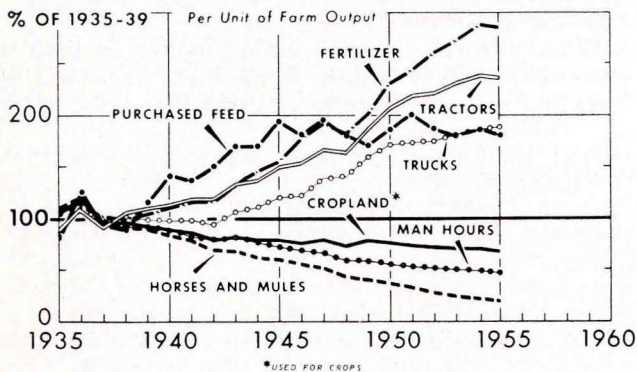
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Fig. 1. Output slightly above 1955, population rise continues.



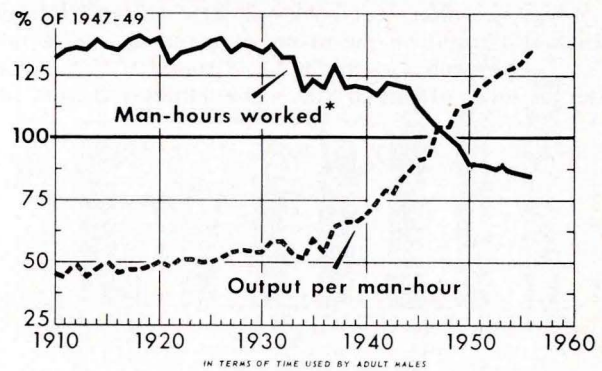
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Fig. 3. Acres harvested off slightly—exports account for more.



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Fig. 2. Farmers substitute purchased inputs for land and labor.



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Fig. 4. Farm output per man-hour up 95 percent since 1940.

the fertilizer was used in the South, but during the war fertilizer use expanded greatly in the Corn Belt. Average value of machinery used in production rose from an index of 61 in 1940 (1947-49 = 100) to 119 in 1949. Crop production per acre rose from an index of 88 in 1940 (1947-49 = 100) to 99 in 1949; livestock production per breeding unit rose from an index of 92 in 1940 (1947-49 = 100) to 104 in 1949.

Using 1910-14 as our base of 100, we find that the index of farm output was 134 in 1940. By 1942, it was up to 155, and it remained near there until the end of the war. Then we had another sharp rise in farm output. Demands for food were heavy in the early postwar years to meet Marshall Plan needs—and, with price ceilings off, prices for farm products shot up. Many production items were more readily available. Farm output expanded as a result. The index of farm production jumped to 168 in 1948.

Now, let's turn to the uses made of this greatly expanded farm output.

Agricultural exports increased sharply during the war and early postwar period. Using 1952-54 as 100, the index of farm exports for 1940 was 26. By 1943 it had risen to 70, and in 1948 it was up to 115.

During World War II, world food output declined while population rose. This created a great demand overseas for United States farm products. Using 1935-39 as 100, the index of world population in 1940 stood at 103.3; the index of food production was 94.9. By 1945-46, the population index was up to 107.4; for food output the index was down to 82.2. At the same time, the government, through Lend-Lease, the Marshall Plan and other export programs, aided in shipping the food to meet these needs.

Domestic demand also was strong during the war. There were fewer competing products available at home for the consumer dollar. The work week was longer. The average soldier either eats or wastes about a third more food than the average civilian, and during the war he had more and better clothing.

Thus, there were needs beyond normal for farm products during the war and immediately after the war. At no time during the war was food really a problem in this country. The Iron Curtain is as far east as it is today largely because of wheat and cotton we made available to our allies and to occupied areas immediately after the war.

But once the war and these unusual early postwar export needs were over and peacetime demands began to prevail, we didn't cut back our farm output. Rather, output kept right on increasing at about the same rate as our population (see table 1). Using 1910-14 as the base, the index of United States population rose from 160

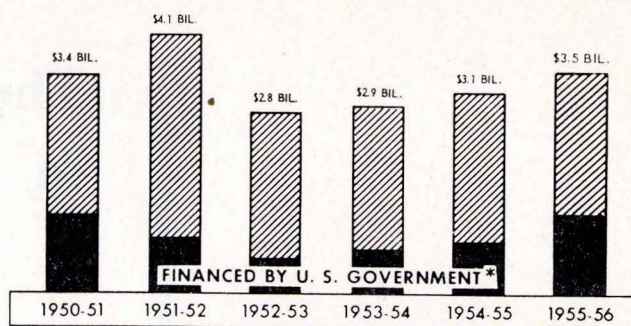


Fig. 5. Government financing of farm exports continues to increase.

in 1950 to 177 in 1956; the index of farm output rose from 163 to 182.

Domestic demand has been strong and rising through most of the period since 1949. The number of consumers has risen steadily. Except for a brief period in 1953-54, business activity and employment have been very high. And even in this period, consumers did not cut back their spending for food. They spent over one-fourth of their disposable income for food all through this period. Retail food sales in 1955 were 20 percent higher than in 1949-50.

In 1945 the index of world population (1935-39 = 100) was 107.4 and of food production, 82.2. By 1953 the population index was up to 117 but the food output index had shot up to 121. World food output had regained virtually the same relation to population as existed before the war. With the world better supplied, export demand for United States farm products declined.

There was brief recovery in export demand in 1951-52 after the Korean outbreak. But the next year, exports dropped a third. Since then they have come back slowly, with the help of government programs. Even so, farm exports in 1955 were only 82 percent of the 1949-50 level.

In 1955-56, farm exports rose with the aid of government assistance. Exports were nearly as large as in 1951-52. But about \$2 of every \$5 of these farm exports were financed by the government (see fig. 5). Part of the 1956 exports also represented stock-piling of products (cotton, for example) by foreign countries. USDA believes it will be difficult to maintain present levels of exports for several years, however. Prospects are for some drop in farm exports in the 1957-58 year.

Wheat exports are below earlier levels. In 1940 we exported 34 million bushels of wheat and flour; between 1945 and 1951 the figure varied from 391 to 504 million

TABLE 1. FARM OUTPUT IN TOTAL HAS EXPANDED RAPIDLY, BUT THE MARKET HAS NOT TAKEN ALL OF THE PRODUCT AT PREVAILING PRICES. DURING RECENT YEARS, STOCKS HAVE BECOME EXCESSIVE.

Year	Index of farm marketings*	Index of U. S. population*	Retail food sales (bil.)	Farm "food" sales† (bil.)	Farm exports (bil.)	Change in stocks of farm products (mil.)
1949	103	101	\$37.9	\$23.5	\$3.8	+\$ 983
1950	99	103	38.9	23.9	3.0	— 52
1951	101	105	43.0	27.8	3.4	— 1,063
1952	104	107	44.5	27.4	4.1	+ 1,032
1953	108	109	44.6	25.9	2.8	+ 1,586
1954	108	111	44.9	24.9	2.9	+ 1,231
1955	112	112	46.1	24.5	3.1	+ 1,348
1955 as % of 1949-50	111%	110%	120%	103%	82%	290%

* 1947-49 = 100.

† Gross cash sales of farm products minus cotton and cottonseed, tobacco and misc.

TABLE 2. MANY CHANGES ARE GOING ON IN AGRICULTURE, BUT THESE HAVE NOT BEEN RAPID ENOUGH TO BRING AGRICULTURE INTO BALANCE WITH THE REST OF THE ECONOMY.

Year	Agricultural resources used			Labor returns per hour on typical farm				
	Harvested land (mil. A.)	Machine capital* (bil.)	Workers (mil.)	Farm output index†	Farm price index†	Cash-grain	Hog-beef	Hog-dairy
1949	360	\$14.5	10.0	102	92	\$1.47	\$1.88	\$0.95
1950	345	16.2	9.3	100	95	1.42	1.98	0.85
1951	344	17.0	9.0	103	111	2.35	2.25	1.24
1952	349	18.1	8.7	107	106	1.81	1.56	1.11
1953	348	18.3	8.6	108	95	1.18	1.09	1.04
1954	346	18.3	8.5	108	92	1.56	1.76	1.13
1955	340	17.8	8.2	112	87	0.74	0.24	0.52
1955 as % of 1949-50	97%	117%	73%	111%	93%	51%	12%	58%

* At 1955 prices.
† 1947-49 = 100.

TABLE 3. THE NATIONAL ECONOMY HAS BEEN GROWING RAPIDLY, BUT FARM INCOME HAS FALLEN BEHIND.

Year	Gross nat'l. product (bil.)	Money wages per factory worker	Income per capita nonfarm	Income to farm people			Net farm income per farm	
				From farming	Nonagricultural income	Total per capita	Iowa	U. S. average
1949	\$257	\$2,856	\$1,500	14.7	5.2	\$765	\$4,618	\$2,389
1950	285	3,085	1,575	15.5	5.3	828	4,361	2,276
1951	328	3,365	1,745	18.0	5.6	977	4,517	2,682
1952	345	3,534	1,853	17.0	6.1	953	4,050	2,660
1953	363	3,728	1,875	15.1	6.0	930	5,445	2,649
1954	361	3,737	1,828	14.2	5.7	911	4,382	2,357
1955	391	3,979	1,935	13.4	6.1	881	4,034	2,268
1955 as % of 1949-50	144%	134%	126%	89%	116%	111%	90%	97%

bushels. Our 1947 wheat crop totaled 1,359 million bushels; our current use (domestic plus exports) is estimated at 1,014 million bushels.

Cotton exports of 1.1 million bales in 1940 amounted to 9 percent of our output. Between 1945 and 1951 exports varied from 33 to 46 percent of output, except for 1947 when they temporarily fell to 17 percent. The 1955 cotton exports of 2.2 million bales constituted only 15 percent of output.

Despite the reduced level of export needs for wheat and cotton, output of these crops continued to be maintained. CCC was forced to ask for more money to finance the heavy buildup of stocks taken over in the price-support program. Allotments and marketing quotas were applied to wheat and cotton, with the result that 1953 was the last completely unregulated year in farming.

Between 1953 and 1955 about 29 million acres were taken out of wheat and cotton under these allotment programs. Much of this land in turn was diverted to the production of feed: About 11.5 million more acres of oats, barley and grain sorghum were grown in 1956 than in 1953. Soybean and flaxseed harvested acreage went up about 7 million acres during this same period.

Thus, feed production in 1956 was 12.3 million tons larger than in 1953—despite a 3-million-acre smaller corn acreage. In effect, we brought wheat and cotton acreage into adjustment with the current market needs by taking the land out of these crops and diverting them to feed production. At the same time, farmers continued to expand their use of capital and new technology. Crop yields rose about 1½ percent yearly—this is the equivalent of adding over 5 million acres of cropland per year. The result: Feed grain output in 1956 was 8 percent larger than in 1953.

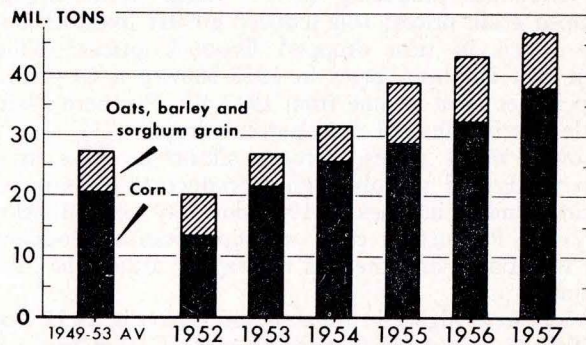
Farmers soon responded to the expanded feed supplies by boosting livestock output, but at a slower rate. We had about 6 percent more livestock breeding units in the United States in 1956 than in 1949—about 2 percent more than in 1953. But this still was not enough to utilize the increase in feed output, and between 1949 and

1956 feed grain carryover rose 12.8 million tons or about 39 percent. Despite the Soil Bank and a drought, feed output in 1956 still outran use; we will add about 6 million tons to the carryover on October 1, 1957 (see fig. 6).

Growth in stocks of farm products has continued since 1952 (see table 1). By 1956, wheat carryover had reached a billion bushels and cotton carryover 14.5 million bales. The wheat stocks were equal to a year's use and exports; the cotton stocks, over a year's use and exports.

Throughout the past 6 years, some adjustments have been made (see table 2). Acreage of harvested land has been reduced slightly; the number of workers in agriculture has gone down sharply; the use of machine capital has gone up.

These adjustments have not been rapid enough to bring agriculture into balance with the rest of the economy, however. Output has been greater than what the market will absorb at prices generally considered satisfactory by farmers. Thus, table 3 shows that labor



STOCKS OF CORN AND SORGHUM GRAIN ON OCTOBER 1, OATS AND BARLEY JULY 1, 1957 BASED ON PROSPECTS FOR PRODUCTION AND DISAPPEARANCE AS OF OCTOBER 1956
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Fig. 6. Feed grain carryover more than doubles in 4 years.

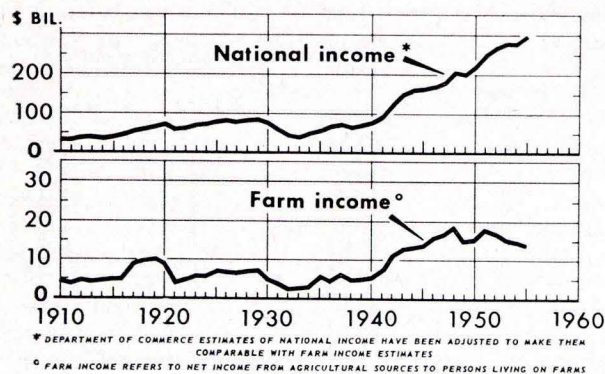


Fig. 7. National income continued up, farm income down in 1955.

returns per hour on typical farms are down sharply from 1949-50.

Table 2 shows that net income per farm has fallen behind the rest of the economy. While the general standard of living has advanced, farmers have not shared anywhere near equally in the fruits of general technological advance.

Farm income nationally hit its peak in 1948. It declined, then recovered as a result of demands created by the Korean outbreak. Iowa farm income hit its peak in 1953 (see fig. 7). Since then, the trend in income has been downward. Meanwhile, the national economy has grown rapidly since 1949. Wages of factory workers have risen. Income per person in the city has gone up sharply (see table 3).

Note that table 3 indicates Iowa farm income per farm has dropped more since 1949 than has the United States average. The USDA Bulletin 158, "Farm Costs and Returns," gives a breakdown of how typical farms in 1955 compared with 1947-49 in prices, costs, productivity and income.

Net farm incomes declined on all types of farms in the Corn Belt, and in all areas where wheat farms, cattle ranches and sheep ranches were predominant. Net incomes also declined on dairy farms in Wisconsin, cotton farms in Texas and tobacco-livestock farms in Kentucky—but increased on dairy, cotton and tobacco farms in other areas.

The sharp boost in feed grain production is the main reason behind the relatively greater income drop in the livestock producing areas. Large feed supplies dropped grain prices; this induced greater livestock output—which in turn dropped livestock prices. Thus, Corn Belt hog-beef farms in 1955 showed a 64-percent drop in net farm income from 1947-49; Northern Plains cattle ranches showed a 61-percent drop.

Lower wheat prices, acreage allotments plus lower crop yields and sharply higher production costs pulled wheat farmers' incomes in 1955 down 49 percent below 1947-49. Production costs are up because allotments idle wheatland, and there is no way to utilize the idled resources.

Prices were higher in tobacco and cotton in 1955 than in 1947-49. Crop yields were up also. Cotton farms in the Southern Piedmont increased in size and efficiency and enjoyed good weather during this period. This resulted in an actual reduction in the total cost per unit

of production on those farms. Thus, cotton farms in the Southern Piedmont had a 43-percent higher net farm income in 1955 than in 1947-49; tobacco-cotton farms in North Carolina had 3-percent higher incomes. These areas are among the least efficient in agriculture in use of resources.

Texas cotton farms did not show a similar increase in size and, thus, didn't enjoy a rise in income between the two periods. Though the price held up, allotments cut the cotton acreage.

Dairy farmers in the Central Northeast portion of the United States had a 14-percent higher income in 1955 than in 1947-49. Here, too there was a sizable increase in output per unit of input, with production per farm up while total cost per unit of production dropped. A higher percentage of milk in this area is sold as retail bottled milk than in Wisconsin. In the latter area, the reduced price of manufactured dairy products resulting from surplus production depressed incomes.

Meanwhile costs have continued to mount. Figure 8 shows how the human resource (as measured by wage rates) in farming has gone up in cost compared with the other resources of land and capital. Here is one of the pressures pushing farming toward becoming more extensive—that is, it puts a premium on a larger output per man.

As the human factor increases in value, it becomes more costly to devote a lot of time per unit of output. So the trend, for example, moves toward more acres of land per man—even at the expense of somewhat lower yields

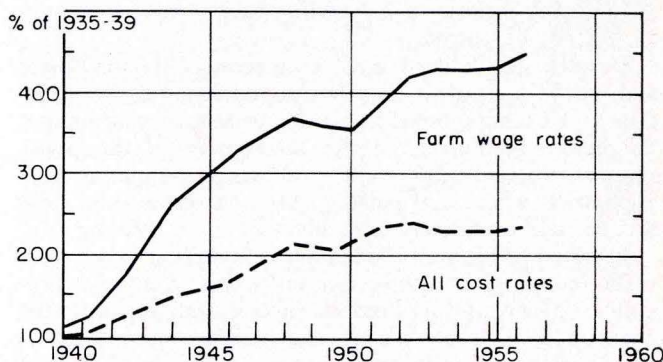


Fig. 8. Farm wage rates compared with all cost rates.

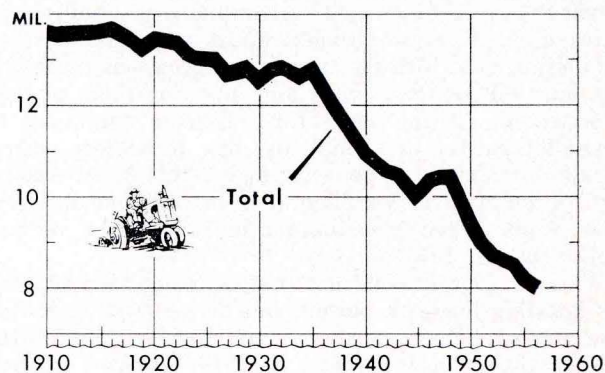
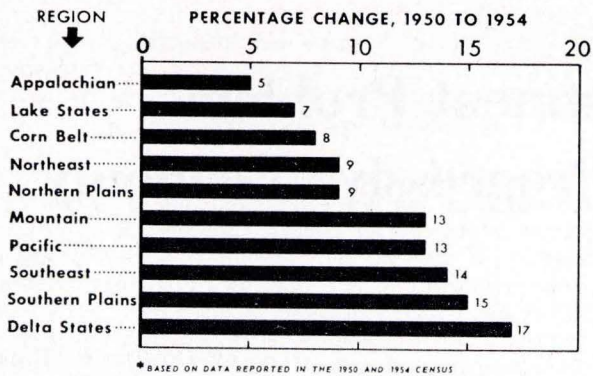


Fig. 9. Number of workers on farms continues downward.

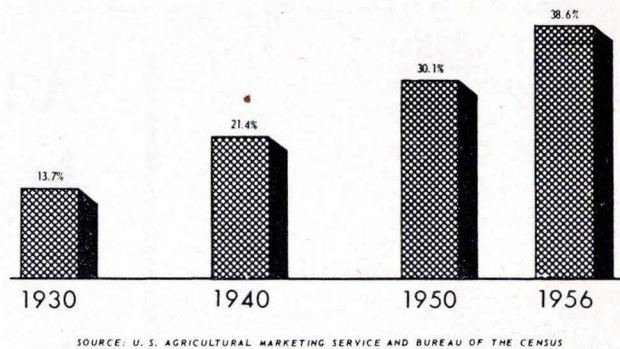


U. S. DEPARTMENT OF AGRICULTURE FIG. 56 (13)-2224 AGRICULTURAL RESEARCH SERVICE
 Fig. 10. Farms increase in acreage in all regions.

per acre; and more cows milked per man—even at the expense of somewhat less milk per cow.

Thus, the forces of adjustment at work on individual farms are operating to:

1. Encourage the operator to move off a farm which is inadequate in size to fully employ the labor available. The force of adjustment operating here is the higher rate of income he can earn in a nonfarm job (see fig. 9).
2. Encourage the operator on an inadequate-sized unit to work additional land, as it becomes available from



SOURCE: U. S. AGRICULTURAL MARKETING SERVICE AND BUREAU OF THE CENSUS

U. S. DEPARTMENT OF AGRICULTURE NEG. 1863-56 (8) AGRICULTURAL MARKETING SERVICE
 Fig. 11. Nearly 40 percent of employed farm people have nonfarm jobs.

people who leave farming to take other work (see fig. 10).

3. Encourage the operator and his family who live on an inadequate-sized unit to seek part-time employment off the farm, where they can't or don't desire to obtain additional land to work (see fig. 11).

These trends are resulting in a shift of resources out of agriculture, but the shift has not been great enough to bring returns from farming for the average farmer into balance with returns from nonfarm occupations. The result is continued pressure on farm income.

Adjustment Problems in a Progressive Economy

BY DONALD R. KALDOR

WITHOUT IMPROVEMENTS in technology and increases in the effective quantity of resources, there would be a ceiling on the size of the national income. This ceiling would be reached when existing resources were distributed among alternative uses in the most efficient manner. National income and per capita income may be increased, however, as long as the returns to resources in some employments are out of line with what may be earned in other employments.¹

Shifting resources from low-return employments to high-return employments increases total income and per capita income. Such a transfer raises returns in the low-return employments and lowers returns in the high-return employments. National income increases because of the difference in the earnings of the transferred resources in the new and old employments. When returns in alternative employments are in line with one another, national income would be at the highest level permitted by existing resources and technology. The economy then would be in perfect balance. Each individual would be earning the largest possible income from the use of his resources.

With national income at the ceiling level, individual income differences would depend entirely on differences in the quantity and quality of resources owned by people. Personal income would vary in proportion to the effective quantity of resources owned. If the incomes of some people were to be raised on grounds of equity, the incomes of other people would need to be reduced. Only with an advance in technology and/or an increase in the quantity or quality of resources could the average level of income be raised.

An upward trend in per capita income is the distinctive feature of a progressive economy. In such an economy national income grows more rapidly than population. Accompanying the increase in per capita income are higher levels of living and an increase in the economy's capacity to produce in the future. The expansion in total income is made possible by improvements in technology and increases in the effective quantity of resources.

¹ In determining the comparative level of resource returns, allowance would need to be made for any differences in resource quality, risk and non-monetary advantage. Unless otherwise indicated, the term income as used in this paper refers to real income as this is affected by the quantity and composition of output. For an analysis of the problems of income valuation, see (6).

DONALD R. KALDOR is professor of agricultural economics, Department of Economics and Sociology.

Advancing technology contributes to larger income by raising the level of output that can be produced with a given input of resources. It also results in new products and improvements in old products to satisfy new wants and to better satisfy old wants. A growing population expands the size of the labor force, and this makes a larger output possible. A larger number of people have to divide up the larger output. But in a progressive economy national income grows more rapidly than population because of improvements in technology and additions to the stock of capital.

By saving out of current income, resources are freed from the task of producing goods for immediate consumption. Some of these resources are used to produce new buildings, machinery, equipment, roads and other capital goods which increase the economy's future capacity to turn out products. Productive investments are also made in people. For example, current spending on education improves the quality of the future labor force and thereby adds to future productivity. Savings also flow into research and the dissemination of new knowledge. This results in future improvements in technology and more widespread use of better production methods.

The rates of increase in technology, production facilities and effective labor force largely determine the *potential* rate of growth in national income. High rates of increase set the stage for rapid growth. Within the limits set by these factors the *actual* rate of growth depends mainly on (a) the rate of expansion in effective demand (total expenditure for goods and services) and (b) the capacity of the economy to reorient the use of its resources in line with the requirements of economic growth.

If effective demand fails to expand rapidly enough to absorb the additional productive capacity resulting from advances in technology, more production facilities and a larger labor force, some of this capacity will go unused. Unemployment will occur, and national income will not expand to the level permitted by resources and technology. On the other hand, if total money demand increases too rapidly in relation to productive capacity, inflation will result. Rapid inflation can reduce the rate of growth in real income by encouraging the diversion of resources from more to less productive employments.

In a progressive economy the pattern of income opportunities undergoes continuous modification. Returns to resources in some employments move out of line with those in other employments. Unless resources are shifted

from low-return employments to high-return employments when this happens, the gains from improvements in technology and increases in the effective quantity of resources are not fully realized. National income will not rise to the level permitted by resources and technology.

Moreover, without adjustments in the use of resources, various industries and individuals will not participate in the rise in income on equal terms. Overexpanded industries will get little if any of the increase in income. Underdeveloped industries will get a disproportionate share. If the overexpanded industries bulk large in the total economy and the maladjustment is not corrected, total money demand may decline, resulting in unemployment and a lower level of national income.

MALADJUSTMENT CREATION

The pattern of income opportunities undergoes continuous modification because the forces operating in a progressive economy change the underlying conditions of supply and demand. These forces affect various products and resources differently. Supplies and demands shift at different rates in alternative employments. As a result, returns in some employments get out of line with those in other employments, and a maladjustment is created in the use of resources. One of the more important of these forces is the growth in per capita income itself.

GROWTH IN PER CAPITA INCOME

A growing level of per capita income has the effect of altering the pattern of demand for goods and services. The reason is that, with rising incomes, consumers change the proportion of income which they spend on different products.

A useful way of looking at the effect of growing income is to relate the percentage change in expenditure on a given product or group of closely related products to the percentage change in income which induces the change in expenditure. The percentage change in expenditure divided by the percentage change in income is called the income elasticity of demand.

Suppose when income goes up 1 percent, other things remaining the same, the retail expenditure on food goes up 0.5 percent. The income elasticity for food would be 0.5. This implies that with rising income the proportion of income spent on food would decline. If other things remained the same and the expenditure on food rose 0.5 percent, we could say that an increase of 1 percent in income would increase the demand for food by 0.5 percent.

Numerous studies of the relationship between income and the pattern of consumption expenditure have been made over the past century. Most of these have been based on budget data. Because of differences in methods and data, the findings in these studies show some variation. However, there is sufficient uniformity in results to warrant general conclusions.

One set of income elasticity estimates for the United States is shown in table 1. The values vary from 0.5 to 1.6. Based on these estimates, a 1-percent increase in income would raise the demands for selected groups of products as follows: food, 0.5 percent; housing, 0.8 per-

TABLE 1. ESTIMATES OF INCOME ELASTICITY FOR CONSUMER PRODUCT CLASSES, UNITED STATES.

Product class	Income elasticity (Percent change in expenditure with a 1-percent change in income)
Food	0.5
Fuel and light	0.5
Tobacco	0.7
Housing	0.8
Medical care	0.8
Personal care	0.8
Reading materials	0.9
Furniture and equipment	1.0
Clothing	1.0
Recreation	1.3
Automobile and travel	1.3
Education	1.6

Source: Mack, Ruth P. The direction of change of income and the consumption function. *Rev. Econ. Stat.* 30: 239-258, 1948. The estimates taken from this study are based on the 1935-36 consumer purchases survey.

cent; clothing, 1 percent; recreation, 1.3 percent; and education, 1.6 percent.

The significance of the food figure for farmers is even greater than suggested by the value 0.5. This estimate is for consumer expenditures at retail. Retail expenditures for food are partly for the services of middlemen. In 1956 about 60 percent of the consumer's food dollar went for these services. The income elasticity for food, therefore, is a weighted average of the income elasticities for middlemen's services and farm products. Recent studies indicate that the income elasticity for middlemen's services is much greater than that for farm products (3, 4). This would mean that a 1-percent increase in per capita income, other things remaining the same, would boost the demand for middlemen's services more than the demand for farm products. One of these studies suggests that the demand for middlemen's services would increase 5 times more than the demand for farm products.² Consequently, in a progressive economy the proportion of the consumer's food dollar going to farmers would have a tendency to fall.

In general, when a rich country grows richer, the demand for food increases relatively little. The demands for so-called luxury items increase most. Many of these will be services. Demands for semi-luxury products increase moderately. Beyond a certain minimum, rising income is spent increasingly for products that satisfy wants for comfort and distinction. Adam Smith's remark in 1776 is still much to the point: "The desire for food is limited in every man by the narrow capacity of the human stomach; but the desire of the conveniences and ornaments of building, dress, equipage and household furniture, seems to have no certain boundary" (6).

The changes in relative demands for products associated with income growth will induce changes in the industry pattern of demand for resources. The demands for resources in industries producing high income elasticity products will rise relative to the demands in industries producing low income elasticity products. In the competition for resources, the low income elasticity industries will be outbid by the high income elasticity industries. As a result the low income elasticity industries will tend to employ a declining share of the economy's total resources. Because of the very low income elasticity for food, agriculture can be outbid by most other industries.

² Daly (3) quotes estimates from an unpublished study by M. C. Burk, "Changes in food expenditure, 1929 to 1954," which puts the income elasticity of demand for middlemen's services at about 0.7 and that for farm products at only 0.15.

This tends to raise the prices of resources used in farm production relative to the prices of farm products. Here is part of the explanation for the so-called cost-price squeeze in farming. It is also part of the explanation for the long-run difficulties in the domestic mining industry, particularly coal mining.

NEW AND IMPROVED PRODUCTS

Another important source of resource maladjustment in a progressive economy is the introduction of new and improved products. These can be introduced either because they satisfy new wants or because they do a better job of satisfying old wants. In both cases there are likely to be effects on the existing pattern of demand for goods and services.

The introduction of a new or improved product may have one of the following effects: (a) it may increase the demand for one or more existing products; (b) it may reduce the demand for some existing products; or (c) it may increase the demand for some products at the same time it reduces the demand for other products.

If the new or improved product is a substitute for some existing product, its introduction will reduce the demand for the old product. One can cite an almost endless number of examples of this effect. The automobile reduced the demand for horses, buggies, livery stables and harness makers. Rayon reduced the demand for cotton. Nylon, dacron and orlon are reducing the demand for wool. Television is reducing the demand for the services of motion picture theaters. Electricity reduced the demand for kerosene lamps. Margarine is cutting the demand for butter. Motor trucks and automobiles reduced the demand for railroad services. Fuel oil reduced the demand for coal.

If the new or improved product is a complement of some existing product, its introduction will raise the demand for the old product. Again there are many examples. Television and new household appliances are increasing the demand for electricity. The power lawnmower and garden tractor are increasing the demand for gasoline. The outboard motor increased the demand for boats and fishing tackle. The automobile increased the demand for roads and policemen.

A change in the demand for a product also means a change in the same direction in the demand for the resources used in producing it. For example, the substitution of margarine for butter has been reducing the demand for butterfat, buttermakers and churns. It has been increasing the demand for soybeans, cottonseed and labor and capital in margarine production. Now a shift in the demand for resources without any immediate decline in supply will mean that the returns to some or all the resources involved will change. In the butter-margarine example the shifts in demand have tended to push the returns in butter production out of line with the returns in margarine production, creating a maladjustment in the use of resources.

NEW PRODUCTION METHODS

Improvements in production methods are one of the most dynamic forces of maladjustment in a developing economy. An individual producer will find it profitable to introduce new methods when they reduce per-unit

costs and/or lessen the degree of uncertainty. The reduction in costs may come about in various ways. Total cost may remain unchanged while output increases. Output may remain stable while total cost declines. Both output and total cost may increase with output increasing more than total cost.

New production methods affect the productivity of resources. Some may raise the productivity of capital relative to labor. In this case, capital will be substituted for labor. The firm's demand for capital will tend to rise, and the demand for labor will tend to fall. Others may raise the productivity of labor relative to capital. Labor will be substituted for capital, and the firm's demand for labor will rise relative to that for capital. Still others may raise the productivity of both capital and labor. If the productivity of both resources are raised in the same proportion, there will be no substitution effect. The firm's demand for both will tend to rise.

In a growing economy, various industries will be affected by different combinations of new production methods. Labor-saving methods will be introduced more rapidly in some industries than in others. The pattern of introduction of capital-saving methods also will be uneven. This is illustrated by the data in table 2, covering 12 manufacturing industries over the period 1904 to 1937. In petroleum and coal products, for example, output per worker increased 239 percent while output per unit of capital decreased 45 percent. At the other extreme, output per worker increased only 17 percent in leather manufacture while output per unit of capital increased 109 percent. Because of differences in the combination of new production methods, relative demands for labor and capital will be changing at different rates in various industries. This will tend to move the returns to labor and capital in some industries out of line with those in other industries. In one industry the return to labor may be high and the return to capital low, while in another industry the reverse may be true.

There is another important type of inter-industry maladjustment that can arise as a result of improvements in production methods. It might best be explained by a hypothetical example.

Suppose all industries experienced a 10-percent increase in output as a result of the introduction of better production methods. Assume that the increase in output required no additional resources and that the level of demand in each industry remained stable. Under competitive conditions and with no increase in the level of total money demand, there would be a general fall in

TABLE 2. PERCENT CHANGE IN OUTPUT PER UNIT OF INPUT IN 12 MANUFACTURING INDUSTRIES BETWEEN 1904 AND 1937.

Industry	Percent change		
	Output per worker	Output per unit of capital	Output per unit of total input
Transportation equipment	308	130	228
Tobacco products	445	100	175
Printing and publishing	156	142	147
Chemical products	147	119	126
Paper products	122	36	69
Beverages	44	75	69
Leather products	17	109	61
Textile products	42	73	57
Petroleum and coal products	239	-45	39
Iron and steel products	54	28	38
Food products	27	17	21
Forest products	6	-42	-18

Source: Stigler, George. Trends in output and employment. National Bureau of Economic Research Inc., New York, 1947.

prices. In industries with inelastic demands, the price drop would be relatively large.³ Industries faced with elastic demands would experience a relatively small decline in price. Total receipts from the sale of products in the inelastic demand industries would fall off and so would the returns to resources.

On the other hand, the elastic demand industries would experience a rise in total receipts and an increase in returns to resources. Earnings of labor and capital would be out of line, and a maladjustment would exist in the distribution of resources. In correcting the maladjustment by bringing returns back into line, resources would need to be transferred out of the inelastic demand industries and into the elastic demand industries.

Of course, all industries do not experience the same rate of improvement in production methods. This is again illustrated in the manufacturing field by the data in table 2. During the period 1904 to 1937, output per unit of total input varied from an increase of 228 percent in transportation equipment to a decrease of 18 percent in forest products. Nevertheless, an inter-industry maladjustment will arise unless the growth in demand in each industry happens to correspond to the growth in output resulting from improved methods. This is highly unlikely in a progressive economy.

POPULATION GROWTH

Mention has already been made of the relation between population and labor force. But what are the effects of population growth on the pattern of demand for goods and services in the economy?

In a progressive economy population growth is accompanied by an increase in per capita real income. Therefore, there are the demand effects of both population and income growth. The effect of rising income has been discussed. To note the effects of population growth itself, it will be assumed that real income rises in the same proportion as population so that per capita income remains stable.

If an addition to population were to have all the characteristics of the original population, all markets for goods and services would expand in proportion to the increase in population. If population increased 5 percent, demands in all product markets would rise by 5 percent.

Now the effect of this on various industries would depend on the nature of the increase in total real income. If population increased 5 percent and per capita income remained stable, total real income would increase 5 percent also. Total real income is the same thing as total net output. So the effect of the general increase in demand would depend on how this 5-percent increase in output was distributed among various industries.

If all industries experienced the same 5-percent increase in output, the 5-percent increase in demand induced by population growth would leave prices and returns in various industries unchanged. However, suppose farm output increased 10 percent while output in

all other industries increased only 4 percent. In this case, prices and returns would decline in agriculture and increase in the rest of the economy.⁴ On the other hand, if farm output rose by a smaller percentage than nonfarm output, prices and returns in agriculture would rise in relation to other industries. In either case, a maladjustment would be created in the use of resources.

In general, population growth is accompanied by changes in age distribution and other characteristics. Some of these will have a differential effect on the markets for goods and services. For example, a rapidly growing population will have a high proportion of young people. Compared with a population that is growing slowly, a rapidly growing population will have larger demands for baby carriages, milk, toys and school books and a smaller demand for tobacco, coffee, dentures, hearing aids and automobiles. As a result, the inter-industry pattern of demand will be affected, and profit opportunities in some industries will rise relative to other industries.

SOME INTER-INDUSTRY ADJUSTMENT TRENDS

Compared with most countries of the world, the United States has had a remarkable history of economic growth. Over the past 6 decades, the nation's gross output of goods and services has multiplied about eight-fold. Although population has increased about two-and-one-half times in this period, per capita real income has risen over 200 percent. Average working hours in the industrial sector have declined nearly one-third. And there has been a big increase in the variety and quality of goods consumed.

The upward trend in per capita income and the forces inducing it have wrought important changes in the distribution of resources among employments. Vast new industries have grown up. Some of the older industries have expanded rapidly. Others have remained comparatively stable. Still others have declined. By and large, the adjustment in the use of resources has reflected the changing pattern of income opportunities associated with economic progress.

LABOR

Available data on the distribution of the labor force are not ideally suited for the purpose at hand. It would be better if the labor force had been classified according to the income elasticity of the products produced. This is not the case, however.

Table 3 shows the distribution of the labor force by broad industrial groups in 1890, 1920 and 1950. These groups have been further classified into primary, secondary and tertiary based on the definitions used by Colin Clark (2). This classification probably would be correlated rather highly with one based on income elasticity. But there would be some important differences in the make-up of the secondary and tertiary groups.

Between 1890 and 1920 the proportion of the labor force engaged in primary production declined from 43

³ Here we have in mind the elasticity of demand with respect to price. The price elasticity of demand for a product is measured by the percentage change in quantity bought induced by a change in price divided by the percentage change in price. For example, if with a 1-percent drop in price, the quantity purchased goes up 0.5 percent, the price elasticity of demand will be -0.5 . Disregarding sign, price elasticities less than 1 are called inelastic and those greater than 1 are called elastic. A fall in price with an inelastic demand implies a reduction in sales receipts. With an elastic demand it means an increase in receipts or total revenue.

⁴ Since the price elasticity of demand for farm products is highly inelastic, an increase in output means a reduction in total revenue—a larger output sells for less than a smaller output, given the level of demand.

TABLE 3. DISTRIBUTION OF THE LABOR FORCE BY MAJOR INDUSTRIAL GROUPS, 1890, 1920 AND 1950.

Industry	1890		1920		1950		Percent change 1890 to 1950	Percent change 1920 to 1950
	No. (000)	%	No. (000)	%	No. (000)	%		
Agriculture	9,990	42	11,120	27	7,015	12	-30	-37
Forestry and fishing	180	1	280	1	127	0*	-31	-55
Total primary	10,170	43	11,400	28	7,142	12	-30	-38
Mining	480	2	1,230	3	1,035	2	+116	-16
Manufacturing	4,750	20	10,880	26	15,930	27	+235	+47
Construction	1,440	6	2,170	5	3,940	7	+174	+81
Transportation and utilities	1,530	6	4,190	10	4,750	8	+210	+11
Total secondary	8,200	35	18,470	45	25,758	44	+214	+39
Trade and finance	1,990	8	4,860	12	12,650	22	+532	+160
Personal services	640	3	1,630	4	3,600	6	+452	+110
Other services	2,570	11	4,810	12	9,310	16	+262	+93
Total tertiary	5,200	22	11,300	27	25,560	44	+390	+126
All industries†	23,570	100	41,170	100	58,460	100	+148	+42

* Less than 1 percent.

† Excludes unallocated workers.

Source: Fabricant, Solomon. The changing industrial distribution of gainful workers. Conference on Income and Wealth. Vol. XI. National Bureau of Economic Research Inc., New York, 1949; and Stigler, George. Trends in employment in the service industries. National Bureau of Economic Research Inc., New York, 1956. Comparable data for primary, secondary and tertiary classification estimated from data in the U. S. Census of Population, 1950. Vol. II. Part I.

percent to 28 percent. Practically all of this is accounted for by the drop in the proportion engaged in agriculture. While agricultural employment actually increased by 11 percent in this period, total employment rose by 75 percent. The proportion engaged in secondary production (mining, manufacturing, transportation, utilities and construction) increased from 35 percent to 45 percent. The number of workers in secondary production rose about 115 percent. Employment in tertiary production (service industries) as a percentage of all employment increased from 22 percent in 1890 to 27 percent in 1920. The number of workers increased 118 percent. During this same period real income expanded nearly 50 percent per capita.

The biggest change in primary and tertiary production came during the next 20 years. In this period per capita real income rose more than 90 percent. Employment in primary production, practically all agricultural, dropped 38 percent. In secondary production employment increased 39 percent, and in tertiary production the increase was 126 percent. Primary production absorbed 28 percent of the labor force in 1920 but only 12 percent in 1950. The number of workers in secondary production as a proportion of all workers remained nearly stable at close to 45 percent. However, the proportion of the labor force engaged in tertiary production increased from 27 percent in 1920 to 44 percent in 1950. In the meantime, the total labor force had increased about 42 percent.

The decline in agriculture has been mainly the result of the low income elasticity of demand for farm products, a rapid advance in output-increasing technology, an increase in the productivity of capital relative to labor associated with improved production methods, and a rise in the price of labor relative to capital. The last two factors encouraged the substitution of machinery for labor on American farms.

Between 1890 and 1915 there was a substantial increase in the size of the labor force in mining. Since 1915, however, employment in the mining industries has been falling. By 1952 the number of workers in coal mining was down 42 percent. In metal mining the drop was 44 percent. Employment in quarries declined only 17 percent. Again, a low income elasticity has been involved. In addition, substitution of other fuels for coal and an increase in metal imports have tended to reduce the demand for local minerals. Mechanization has come in to replace labor. Moreover, high costs, associated with depletion, have closed many mines.

The aggregative data in table 3 cover up many important divergent trends within the broad industrial groups other than agriculture and mining. For example, between 1925 and 1950 employment in rail transportation dropped 30 percent. On the other hand, employment in air carrier operations increased from practically nothing to more than 82,000.

Table 4 gives a breakdown of the changes in employment in manufacturing industries between 1899 and 1937. It is apparent from these data that there have been big differences within the manufacturing field. While total manufacturing employment increased greatly over this period, employment in a number of specific manufacturing industries declined sharply. Comparing the two extreme cases, we find that employment in the carriage, wagon and sleigh industry declined by 96 percent between 1899 and 1937, while that in the automobile industry increased by 21,300 percent. Of course, these changes are not unrelated. The decline in the carriage, wagon and sleigh industry is to be explained largely in terms of substitution effects induced by the development and growth of the automobile industry. The drop in the locomotive industry is also tied in with the expansion in automobile production.

It is clear that reductions in employment have not been confined to agriculture and mining. Even some of the service industries have experienced a drop in the number of workers. This has been true, for example, in domestic service. Between 1940 and 1950 there was a decline of 28 percent in the number of people working as domestic servants.

Much of the adjustment in those industries experienc-

TABLE 4. PERCENTAGE CHANGE IN NUMBER OF WAGE EARNERS IN SELECTED MANUFACTURING INDUSTRIES, 1899 TO 1937.

Industry	Percent change 1899 to 1937
Carriages, wagons and sleighs	-96
Chewing and smoking tobacco	-65
Locomotives	-53
Lead metal products	-51
Linen goods	-43
Blast-furnace products	-41
Flour	-18
Leather goods	-3
Salt	3
Carpets and rugs	+8
Butter, cheese and canned milk	+157
Paper and pulp	+177
Wood distillation products	+183
Canned fruits and vegetables	+213
Paints and varnishes	+228
Petroleum refining	+583
Chemicals, incl. gas and rayon	+693
Automobile, incl. parts and bodies	+21,300

Source: Fabricant, Solomon. Employment in manufacturing, 1899-1939. National Bureau of Economic Research Inc., New York, 1942.

ing a decline in employment has come via a decline in the number of young workers entering the industry. Death and retirement continuously subtract from the labor force. If the number of new workers entering an industry drops below the number leaving because of death or retirement, employment will decline. In most cases, however, some of the adjustment has come through the transfer of workers already engaged in the industry.

CAPITAL

Reliable data showing long-run changes in the inter-industry distribution of capital are not available. Such figures as are available suggest that important changes have taken place.

Since the turn of the century, large amounts of capital have flowed into new industries—automotive, electrical appliances, aluminum, radio and television to name but a few. Some of the older industries, such as steel, petroleum, rubber, chemicals and electric power, have absorbed much additional capital. On the other hand, apparently little new capital has flowed into the railroad industry. The amount of capital has declined sharply in the carriage and wagon industry and in the marble and stone products industry.

Some indication of the relative rates of growth in capital inputs in manufacturing industries is given by the data in table 5. The indexes of growth are based on the book value of capital assets other than land expressed in current dollars. Figures on book value tend to vary with changes in the price level. However, since the base for each index number is the growth in all manufacturing, they do give a rough picture of relative growth rates.

Between 1904 and 1937 the growth in capital assets in the steel and chemical industries was about the same as in all manufacturing industries. Leather goods, beverages, textile products, nonferrous metal products and tobacco products were some of the industries that apparently absorbed relatively small quantities of additional capital. On the other hand, the automotive, petroleum, rubber and electrical machinery industries experienced a relatively large increase in capital assets.

In the inter-war period there was little if any change in total capital input in agriculture. However, an important change occurred in the form in which capital was employed. Technological developments made \$1,000 of capital in the form of a tractor more productive than an equal amount in the form of horses and mules. As a result, tractor power was rapidly being substituted for horse power. Toward the end of the 1930's, total capital input apparently began to increase. It continued to rise during the war and early postwar period. From 1948 to 1954 capital inputs in agriculture expanded rapidly.

Estimates cited by Black indicate that in 1910 agriculture absorbed about 42 percent of all reproducible assets in the economy (1). The figure stood at 22 percent in 1955. The percentage declined consistently from 1910 to 1940. It increased between 1940 and 1950 but declined again after 1950.

PROBLEM OF MAINTAINING ECONOMIC BALANCE

We have discussed briefly some of the more important factors that have been operating to produce inter-industry

TABLE 5. INDEX OF GROWTH IN BOOK VALUE OF CAPITAL ASSETS OTHER THAN LAND IN MANUFACTURING INDUSTRIES, 1904 to 1937.
(Growth in all manufacturing industries = 100.)

Industry	Growth index
Leather goods	8
Beverages	26
Textile products	38
Nonferrous metal products	49
Tobacco products	54
Printing and publishing	56
Forest products	61
Transportation equipment other than automobile	61
Stone, clay and glass products	78
Foods	97
Iron and steel products	98
Chemical and coal products	100
Paper products	154
Miscellaneous	199
Electrical machinery	202
Rubber products	234
Petroleum refining	1,580
Automobiles, incl. bodies and parts	3,610

Source: Based on data from Fabricant, Solomon. Employment in manufacturing, 1899-1939. National Bureau of Economic Research, Inc., New York, 1942.

maladjustments in the American economy. The changes in the pattern of income opportunities induced by these factors have stimulated adaptations in the use of resources. Some of these adjustments have been noted. A few comments on the problem of maintaining economic balance in a progressive economy may now be in order.

The nature of this problem may be viewed as follows: During a given period, the forces of maladjustment will create a certain amount of imbalance in the economy. This will be measured by the size of the differentials in resource returns generated before any adjustment takes place. At the same time, some people will be reacting to the changes in the pattern of resource returns. Some resources will be reallocated from low-return employments to high-return employments.

In the process of reallocation there will be a tendency to eliminate the differentials in resource returns created by the forces of maladjustment. A given amount of resource adaptation will induce a certain amount of correction in the pattern of differential returns. Thus, there will be a certain rate of maladjustment creation and a certain rate of resource adaptation. When the rate of resource adaptation keeps pace with the rate of maladjustment creation, economic balance is maintained. When it falls short, imbalance results.

Suppose industry X is unable to maintain itself in balance with the rest of the economy. How might economic balance be re-established? In principle, balance can be achieved by (a) stepping up the rate of resource adaptation, (b) cutting down the rate of maladjustment creation or (c) doing some of both.

If the rate of maladjustment creation is to be reduced, it means operating on the forces responsible for economic growth. This raises a basic choice problem for society. A highly progressive economy will be one in which rates of technical progress and increase in the quantity and quality of resources are high. Inevitably, this will mean a high rate of maladjustment creation. If economic balance is to be maintained, it also will mean a high rate of resource adaptation. However, there are certain disutilities (costs) associated with a rapid rate of resource adaptation. While economic progress provides the basis for a rising average level of living, it does so at some cost in terms of individual instability and insecurity. It would be wasteful to pay any more for a given amount of progress than is necessary to get it. Here, well-designed public policies can help to minimize cost. But even with

the best of public policies, a high rate of economic progress will entail some cost.

Society's problem is to decide on the optimum rate of economic progress in light of the costs associated with different rates of growth. In a democratic community this decision will be based on the relative value people attach to progress on the one hand and individual economic stability and security on the other. The valuations of people will differ. It is one of the functions of our democratic political machinery to aggregate these valuations in reaching a social decision.

If people were fully aware of the implications of recent decisions with respect to the forces of economic progress, and if our democratic machinery worked perfectly, it could be argued that the present potential rate of growth is optimum. In this case the only approach to the problem of imbalance in industry X, consistent with the desired rate of progress, is to speed up the rate of resource adaptation. This is the only solution that will bring the actual rate of growth into line with the potential rate of growth and at the same time provide a level of income

opportunities in industry X comparable to that enjoyed in the rest of the economy.

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Nature of the Agricultural Adjustment Problem

BY EARL O. HEADY

TECHNOLOGICAL change is one of the more important forces bringing about the need for adjustment of agriculture. Farming has become highly efficient. Labor productivity has increased greatly, and fewer people and farms are needed to meet the nation's food requirements.

During the past century society—the public—has assumed a major role in furthering technological improvement in agriculture. In contrast with other industries where the public directly plays only a minor role in furthering technical progress, the American society has expressed direct interest in extending agricultural output. This interest is reflected in appropriations for agricultural colleges and the United States Department of Agriculture.

BASIS OF PUBLIC SUPPORT

Society has been interested in financing innovations and in increasing agricultural output for several reasons: *One is to assure a sufficiently large food output and an adequate diet for a growing population.* Looking forward in 1860 and making predictions of the population-food balance over the next century, society had an important reason to be concerned about the period ahead. Population was increasing by a quarter to a third in each decade. Agriculture was making parallel strides in output through settlement and development of new farming regions; but the end was apparently in sight as settlement of the more productive soil areas was nearly completed. If future increases in agricultural output were to keep pace with population trends, expansion in the farm plant would have to come largely from a greater output per acre.

Two possibilities existed: (a) to use more labor and capital per acre (a more intensive agriculture) with techniques known at the time—and a consequent increase in land productivity but a decline in labor and capital productivity or (b) to develop innovations which would increase the physical productivity of land, labor and capital alike. Decision was made by the American society to emphasize the latter. The decision was wise, and the administration of the land-grant college and United States Department of Agriculture programs has been efficient.

In the last century, population of the United States has increased by 550 percent. Agricultural output has increased similarly—with the major part of the increase coming from technological improvement. Starvation has

not been a threat, and evidence indicates that food demand is not likely to press on food supply in the next quarter century. This has, in fact, been the situation for the past quarter century, aside from war-based demand.

SMALL SCALE OF FIRM

A second basis for public sponsorship of farm technological advances is the small scale of the firm in agriculture. *Individual farmers generally do not operate on a sufficiently large scale and do not have sufficient funds for organizing their own research units.* In the first 2½ centuries of United States history, relatively few industrial firms invested in research relating to agriculture. The investment of industrial firms in technical innovations for agriculture has, of course, increased greatly in recent decades. Development of more and fundamental knowledge in these fields has led to the creation of new chemicals, biological materials and machines which could be produced commercially and marketed in agriculture.

Consequently, industrial firms have increased their own investments in uncovering more discoveries. However, there are large areas of possible agricultural improvements or scientific relationships which do not result in easily fabricated, packaged and marketed material products or which do not readily lend themselves to patenting and brand promotion. In these areas particularly, farm firms are too small to carry forth their own research. They will continue to require publicly supported research.

COMPETITIVE STRUCTURE

A third basis for public support of farm innovations is the competitive nature of agriculture. Agriculture approaches the norms of perfect competition with its several million firms—none of which alone produces a large enough proportion of total output to affect prices for products or resources.

Society evidently wishes that an important degree of competition be maintained in the American economy. These values are reflected in various types of anti-trust legislation. They are related directly to agriculture in historic legislation favoring family farms. An essential characteristic of a family farm is: It is not large enough to exercise monopoly power in commodity markets or in the labor or land market. *Public sponsorship of agricultural research has likely helped to promote and maintain the competitive nature of agricultural firms.* Farming improvements are more equally available to all farmers.

EARL O. HEADY is professor of agricultural economics, Department of Economics and Sociology.

INCREASING FARM INCOME

A fourth possible basis is that of increasing incomes of farmers. Whether or not aggregate farm income is increased or decreased, as a result of technological improvement, depends mainly on two things: (a) the price elasticity of demand for the particular product and (b) whether the technical innovation increases aggregate farm output.

In practical terms, the price elasticity of demand indicates the percentage by which consumption of a product increases for a given percentage decrease in price. Or, of more interest here, it measures the percentage by which price decreases, if the market is to absorb a given percentage increase in output. If the elasticity is greater than 1.0, price will decline with greater output, but the percentage decline in price will be less than the percentage increase in output, and total revenue will increase. An example of a change in output with an elasticity greater than 1.0 is given below.

Elasticity greater than 1.0

Initial output . . . 100	New output 110
Initial price \$1	New price \$ 0.95
Initial revenue . . . \$100	New revenue . . \$104.50

In this example, output increases by 10 percent, and price declines by 5 percent. Measured roughly, the elasticity is $10 \div 5 = 2$. Consequently, an increase in total output increases the total value of sales. In the next example, however, the elasticity, measured similarly, is $10 \div 20 = 0.5$. A greater output will cause revenue to decline.

Elasticity less than 1.0

Initial output . . . 100	New output 110
Initial price \$1	New price \$ 0.80
Initial revenue . . . \$100	New revenue \$88

For products with an elasticity coefficient of less than 1.0, increased output alone will have the aggregate effect of lowering total revenue. However, individual farmers who first adopt output-increasing practices can gain greater profits. They produce only an atomistic proportion of the total product, and their increase in output can be sold without a material reduction in price. They will increase profit accordingly. However, when the masses of farmers increase output, the aggregate outcome will be a percentage decrease in price greater than the percentage increase in production. Even with a price elasticity of less than 1.0, favorably situated farm groups can gain at the expense of other groups.

As an example, suppose that output of a product increases by 5 percent while price declines by 10 percent. The elasticity coefficient is $5 \div 10 = 0.5$, and total revenue will decline. If however, output of one group of farmers increases by 20 percent, they will gain in revenue because price declines by only 10 percent. In contrast, a group whose output increases by only 5 percent, or not at all, will have reduced revenues (2). Obviously, if a sufficiently vigorous research and educational program is developed in a state such as Iowa, its farmers may keep ahead of farmers in other states and gain income accordingly. In the same vein, to slacken technological improvement in Iowa while it is carried forward rapidly in other

states would cause farmers in other states to gain income at the expense of Iowa farmers.

GENERAL ECONOMIC PROGRESS

A fifth and foremost basis for public sponsorship of technological improvement (and perhaps the over-all goal of technical progress in agriculture) in recent decades, when food production potential has been large relative to demand prospects, is that of general economic progress. Societies obviously place great value on economic progress—the availability of more goods, services and leisure per capita. Given a stock of known natural resources, the rate of and limits to economic progress revolve largely around technical improvements; the ability to increase ends relative to means, with the ends representing consumable goods and services, and the basic means representing natural resources. For a nation richly endowed with natural resources, economic progress and per capita income depend particularly on the productivity of labor in various sectors of the economy. With a large stock of basic resources, national income can move upwards only at the rate allowed by the limiting labor force.

National income has, aside from temporary setbacks due to depression, moved ahead rapidly in recent decades. Disposable personal income has increased rapidly over the last decade. The results of this progress are expressed on every hand—in the amount and variety of food, the adequacy of housing, the number of home appliances, automobiles, health services, recreation and other goods and services which are no longer considered to be luxuries but are accepted as “part of the American way of life.”

Accomplishments in technical improvement of agriculture have contributed to this progress. At the same time, this economic progress, to which farming has made an important contribution, has caused, and is causing, income and resource transfer problems to impinge on farmers. Agriculture has become physically productive and efficient. In doing so, it has freed labor to be used elsewhere in the economy to produce other goods and services which characterize the American way of life and which attract an increased proportion of expenditures as per capita incomes increase.

Food is available in quantity and quality at a relatively low price. In contrast with wide areas of the world where the greatest proportion of the employed person's time and the major part of the consumer's budget is required for obtaining food, the average United States family need devote only the minor part of its income to food, with an increasing portion becoming available for other goods and services. The standard of living is low in many parts of the world because a large proportion of the labor force must be used to produce food.

CONTRIBUTION OF FARM TECHNOLOGICAL ADVANCE TO ECONOMIC PROGRESS

As a primary industry, agriculture possesses characteristics which qualify it for prior consideration in public investment for improving techniques. An important basis for this activity is general economic progress. Perhaps the land-grant college system has devoted insufficient

TABLE 1. PRODUCTIVITY PER PERSON AND PROPORTION OF WORKING FORCE ENGAGED IN PRIMARY, SECONDARY AND TERTIARY INDUSTRIES. SELECTED COUNTRIES, 1924-35.*

Country	Average real production per head, all industries (International value units)	Percent of working force in:		
		Primary industry	Secondary industry	Tertiary industry
New Zealand	1,435	27	24	49
United States	1,368	24	30	46
Canada	1,337	32	23	45
Denmark	980	21	33	44
Germany	649	24	39	37
France	684	25	40	34
Japan	408	50	20	30
Czechoslovakia	455	27	44	29
Hungary	359	54	25	22
Romania	243	68	17	15
Russia	285	74	15	11
India	198	66	14	21

* Source: Colin Clark, *Economics of 1960*. MacMillan and Co., Ltd., London, 1942, pp. 24-28; and Colin Clark, *Conditions of economic progress*. MacMillan and Co., Ltd., London, 1939, p. 179.

effort to placing this picture before the public. Certainly, one of the dramatic accomplishments of the land-grant college system and the United States Department of Agriculture has been in aiding economic progress through enabling fewer workers to meet the food needs of a growing population. Thus the size of the nonfarm working force might be increased more rapidly.

The fewer resources which are used in agriculture as a primary industry, the greater is the proportion which can be used in secondary industries (fashioning raw materials into consumption goods—especially in extending the variety, quality and luxury embodied in consumer commodities) and tertiary industries (personal services and other activities which produce a nonmaterial output). Levels of real income and standards of living over the world correspond roughly to the proportion of the working force engaged in primary and secondary industries (see table 1).

ADVANCE IN PRODUCTIVITY OF AGRICULTURAL LABOR

Technical progress has made possible rapid advance in the productivity of United States farm workers. Each farm worker supported only four other persons through food and fiber production and including those in agriculture in 1840, and only eight other persons in 1920. However, by 1956 each farm worker was supporting 20 other persons (see table 2).

The ability of a farm worker to support other persons through production of food and fiber did not increase materially when increases in total output came largely from settlement of new agricultural regions. A marked upward trend took place after land-grant colleges had been established over a period sufficiently long to increase the rate of developing technical improvements and attracting farmers in educational programs. Without this increase in labor productivity, approximately 40 million workers would now be required in agriculture, as compared with the current 8 million farm workers and a national labor force of 60 million persons (estimates of the percentage

TABLE 2. PERSONS (FARM AND NONFARM) SUPPORTED BY PRODUCTION OF ONE FARM WORKER, 1820-1955.*

Year	Persons supported per farm worker	Total farm employment (million)
1840	3.95	4.4
1860	4.53	7.3
1880	5.57	10.1
1900	6.95	12.8
1920	8.27	13.4
1940	10.81	11.0
1955	19.74	8.2

* Source: Production Economics Research Branch, United States Department of Agriculture.

of the U.S.S.R. labor force engaged in agriculture range from 50 to 60 percent).

The tempo in increased labor productivity has been especially great in the last 20 years. Output per man-hour of farm labor has nearly doubled since 1940 and offers a fairly obvious basis for the extreme pressure on farm labor in recent years. The cost-price squeeze, the relatively high price for farmland and the limited number of farming opportunities together emphasize the effects of the increased productivity of agricultural labor. Consumers are reflecting, through prices paid in the market, their wish that more of the labor freed in agriculture be transferred to other industries. Farmers are bidding for larger units because a given labor supply will now handle a greater volume.

Discussions of freeing agricultural labor, or of increasing its productivity, ordinarily bring to mind mechanization and physical innovations. However, biological innovations also serve to substitute for or to free labor in producing the same or a greater output. For example, new varieties, improved cultural practices, fertilization and other practices which increase yield per acre, without increasing labor inputs, by 20 percent have the effect of increasing labor productivity by the same amount. Or, the capital invested in these techniques serves to substitute for labor in this manner:

Suppose that initial yield is 50 bushels per acre for a given set of techniques which requires 8 hours of labor per acre. Sixty acres and 480 hours of labor are required to produce 3,000 bushels.¹ A new technique (seed, fertilization, etc.) is developed which boosts yield to 60 bushels. Consequently, 50 acres and 400 hours of labor are now required to produce the 3,000-bushel output. The capital represented by the new technique has the effect of substituting for 10 acres of land and 80 hours of labor, in producing the given output. The same output can be produced with less labor, or a greater physical output can be produced with the same labor.

While the example relates to crops, the same principle applies to biological improvements for livestock. A group of innovations for livestock which results in a 20-percent greater output from the same amount of feed also serves as a substitute for land and labor in producing a given output. While increases in output per breeding unit of livestock have been less than increases in per-acre yields of crops, biological and mechanical innovations together have increased labor productivity in livestock by 72 percent since 1910. Labor productivity for all agricultural products has increased by 187 percent in this same period. The increase has averaged about 350 percent for all grains (see table 3).

The magnitude by which technical progress in agriculture has freed labor to be used elsewhere in the economy is a function of these productivity changes and changes in total agricultural output. While total agricultural output increased by 85 percent from 1910 to 1955, an increase of only about 80 percent was required to meet population growth and other market outlets.

Considering some change in the composition of agricultural output between 1910 and 1955, the labor force needed to meet 1955 requirements was only about 65 percent of the 1910 labor force in agriculture. Or if the

¹ Many innovations are of this nature: They increase yields without increasing labor requirements per acre, except for handling the extra product.

TABLE 3. PRODUCTIVITY PER MAN-HOUR OF LABOR. ALL FARM PRODUCTS AND SELECTED GROUPS OF PRODUCTS. PERCENT OF 1910.*

Year	All farm products	All livestock and products	Meat animals	Milk cows	Poultry	All crops	Feed grains	Hay and forage	Food grains
1910	100	100	100	100	100	100	100	100	100
1920	109	100	102	103	100	113	115	97	121
1930	117	107	110	117	107	113	105	106	111
1940	150	114	115	120	118	150	149	119	171
1950	244	152	127	167	162	250	313	224	409
1955	287	172	132	186	193	290	415	230	511

* Source: U. S. Dept. Agr., Agricultural Research Service. Changes in farm production and efficiency, 1955 summary. (Mimeo.) June 1956.

base year used is 1940, labor productivity increased by 90 percent in the 15-year period to 1955. Rate of output, slightly in excess of rate of food requirements, increased by 30 percent. Considering changes in composition of output, only 55 percent of the 1940 labor force was required to produce the 1955 output. The agriculture labor force during this period, however, declined by only 26 percent. Roughly, the amount of labor freed by technical improvements, but which remained in agriculture, was about 20 percent of the 1940 labor force for the industry.

While this surplus labor is underemployed in terms of economic efficiency criteria, it has not become unemployed. Instead it has continued to be used in producing agricultural products. The result is a rate of agricultural output which exceeds annual demand. Given the low price elasticity of demand for farm products, returns are lowered on large segments of labor employed in agriculture—and also on capital and land in agriculture. Since returns to the labor, capital and land owned by farm persons represent the components of their income, farm family incomes also are depressed.

REALIZING GAINS FROM PROGRESS

General economic progress is an important and sufficient basis for public sponsorship of research and education in technical improvements for agriculture. While the rate of change which is preferable has not yet been established, society does desire progress.

If general economic progress is to be accepted as the basis for public investment in agricultural improvements, however, it makes little sense to free labor and leave it stranded in agriculture. Investment in technical improvements must be accompanied by greater investment in services which aid the transfer of labor freed from agriculture. The adjustment is already taking place, but it is not taking place rapidly enough to keep resource returns and family incomes in line with those of other industries.

GAINS TO SOCIETY AND REMAINING FARMERS

Through the voting mechanism and the appropriations provided for agricultural research, consumers indicate that they wish continued technical improvement in agriculture, as a contribution to general economic progress. But through the pricing mechanism and the cost-price squeeze which they attach to agriculture, consumers are saying that we have too much labor in agriculture producing too much farm product—that we, therefore, need somewhat fewer farm families and that farms need to be somewhat larger.

It was noted earlier that labor requirements in agriculture declined by about 45 percent in the past 15 years while labor employment declined by only about 26 percent. Had an additional 20 percent of the 1940 labor

force transferred in the period 1940-55, 1.6 million more workers would have left agriculture.² This additional 20-percent decline in the labor force would not have brought about a similar decrease in agricultural production. After all, output increased by 30 percent while the labor force was declining by 2.7 million workers during this period.

However, transfer of an additional 20 percent would have helped relieve the pressure by allowing some adjustment in the size of remaining farms. Remaining farms which were adjusted in size could have realized, particularly if they were smaller units, economies of scale that are known to exist in agriculture. Consequently, at the same or somewhat lower prices, the enlarged farms could realize greater profits. This is possible because, with the same labor force and machinery investment, they could add less to variable costs (fertilizer, seed, fuel, etc., for operating the additional acres) than to gross income because of scale economies.

Improvements in income of persons remaining in agriculture and operating farms of average size must look mainly to this adjustment for increasing their incomes. It is an adjustment which allows a fuller and more efficient use of labor and machinery—a removal of labor underemployment on farms—as a result of improved techniques in agriculture.

It appears unlikely that moderate reductions *per se* in the farm labor force will reduce agricultural output and increase aggregate income through an increase in price for farm commodities. Our studies show that even in Iowa, labor and machinery are not used to capacity. Farms of the average size typically can add more acreage without increasing capital expenditures in the same proportions, and typically with the labor force available on the farm.

The consolidation which is taking place in Iowa and elsewhere in the Midwest, as some families give up farming and remaining farmers add to the size of operations, doesn't promise to reduce output substantially in the near future. Tentative data indicate that perhaps most farmers who add to their units ordinarily have the managerial ability and capital to increase yields and output above that realized by operators who leave farming. There is, however, considerable opportunity for expansion in farm size to allow net revenue gains, even though a shrinking farm population in the Corn Belt may not result in net output reduction.

A recent Iowa study indicates that the typical 160-acre farm on Shelby-Grundy-Haig soils can be increased

² The figure 1.6 million should not be taken as indicating the decline in the agricultural labor force required to bring about balance between agriculture and industry in resources employed and income. It simply indicates the rate at which labor was replaced during this period. It should be remembered that, in the base year 1940, a surplus labor force already existed in agriculture. This surplus, whatever its magnitude, would need to be added to the 1.6 million figure, to determine the "equilibrium" quantity of labor to be transferred.

to 240 acres without, aside from seasonal help or exchange work at harvest, increasing the labor supply and without any substantial increase in machinery investment (1). In addition, the livestock enterprises can be increased in size without increasing labor beyond that furnished by the family.

This opportunity also is reflected by studies in other areas of the state. A study in north-central Iowa indicates that costs per unit of crop product for a 320-acre farm are about \$7 less than for a 160-acre farm, the typical size in the area (3). In this sense, expansion in farm size can allow increased family income through both (a) lower per-unit costs and (b) an increased volume of output per farm. Adjustments of this type are needed, so that the combination of resources used—the amount of land and capital employed with the farm families' labor—gives a return comparable to that of other employment opportunities. This comparability of resource returns would characterize a balanced agriculture.

GENERAL GAIN FROM PROGRESS

Because of the low price elasticity of demand for farm products, gains to farm families from technical progress generally, and in agriculture specifically, must come mainly from these types of adjustments. Farmers, as well as the rest of the consuming society, gain from economic progress in the sense that products in general are more abundant and are less costly in terms of the resources owned by the family.

Because economic progress has gone forward at a rapid pace, urban and farm families can buy automobiles, home appliances, recreation and other goods and services at lower real prices. For example, purchase of one of the more popular brands of automobiles required the product of about 1,100 hours of labor devoted to corn by an Iowa farm family in 1920. The same make of automobile, although much improved mechanically and selling at a higher monetary price, required only about 535 hours in 1955. Just as the farm family can buy an automobile with fewer hours of labor, the urban consumer can buy food with the product of less labor because of technical progress.

STEPS NEEDED

As we invest in technical improvements for agriculture, we need to invest in services which maintain or restore balance in both the resource and income structure of the industry. Two things are needed: (1) We need research, education and programs which aid in increasing economic efficiency for farmers remaining in the industry. We will always need farmers, and their welfare is important.

Agriculture is a competitive industry. It will continue to be so, and farming can be conducted profitably only by those who have the proper abilities, skills and capital. As in the past, we need to maintain a flow of information to operators who will or should remain in farming. *We need to properly train the youth who will take their place.* (2) We need to intensify a parallel effort which helps agriculture adjust in numbers of farms, quantity of labor and general resource structure; and to allow those remaining to have favorable incomes.

The adjustments required and the activities which will facilitate them are complex. They must revolve largely around the more flexible adaptable part of the farm labor force; namely, farm youth. With prospects for continued technological improvement and increases in output, the adjustment period for agriculture is going to extend for a long period into the future.³ Balance can be facilitated by aiding farm youth, when their incomes and life satisfactions will be greater in some other occupation, to enter that occupation rather than entering agriculture. We provide a positive service to these persons by training, informing and counseling them so that they make correct choices when they enter the labor force. We provide them a disservice if we encourage or allow them to enter farming—only to find out 4 or 5 years later that they have made a mistake and should switch from farming.

There are some young persons who have already started farming who would have greater incomes in other occupations. To the extent that they are still renting farms, do not have large families or have not established deep roots in the community and are favorable to off-farm employment, their flexibility and mobility is quite high. But for the young families who remain, informational services, capital and other resources need to be made available to help guarantee a favorable income and living level.

Certainly we should not expect many middle-age farmers, particularly those who are owners, to move from agriculture. Some are flexible and can make complete shifts; others can combine other employment into a part-time farming activity. Major changes in the size of the labor force are going to be made through selection of an occupation by younger persons.

There are, however, many persons in agriculture who would have higher incomes and greater satisfactions in life if they were to transfer to nonfarm employment. We should help these persons find employment opportunities which match their skills and lifetime goals—wherever they can do so and live what is to them a more satisfactory life. Persons operating undersized, low-income farms with insufficient capital largely fall in this category.

³ This is necessarily true because of the natural surplus of births over deaths in agriculture as well as because of labor freed by technological advance.

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Agriculture's Capacity to Adjust¹

BY JOHN F. TIMMONS

ADJUSTMENTS in agriculture conducive to technological and economic progress call for (1) increasing acres and/or capital per farm and (2) decreasing numbers of farms and farmers. The net effect of this adjustment would reduce labor devoted to agriculture in relation to land. Within this context of adjustment, current problems of agriculture spring from (1) the persistent tendency to overproduce the market, i.e., producing more products than the market will absorb at acceptable prices to producers, (2) internal inefficiencies within farm firms, i.e., relatively high costs per unit of output, (3) birth rate among farm people considerably in excess of replacement opportunities on farms and (4) inter-industry immobility of farm people, i.e., a reservoir of underutilized labor in farming in relation to other industries. These problems, although difficult to appraise in terms of individually contributed consequences, support the need for further study and action of a remedial nature. These same problems, however, call for substantial and continuing adjustments within and between farms, if farmers are to benefit fully from technological improvements and participate fully in the economic progress of the nation.

Agriculture's capacity to adjust to technological developments in the productive and consumption processes is limited by a number of factors. Major limiting factors include (1) natural increases in farm population in excess of opportunities in farming, (2) immobilities associated with farm people in leaving farming, (3) persistent size of farm patterns lagging behind technological change and (4) the family farm concept as interpreted in various farm programs. The diagnosis and understanding of these as well as other impediments to needed agricultural adjustments are essential to the prescription of remedial measures.

RESTRICTIVE FACTORS IN AGRICULTURAL ADJUSTMENT

Most agricultural programs, whether educational, credit or subsidy in nature, have favored maintaining current numbers of farms and farmers. Hence, they have

¹ This paper was developed from research underway in Iowa Agricultural Experiment Station Research Project 1319 which constitutes Iowa's contributing project to NC-15, a regional study on problems experienced by young farm people in getting established in farming. Robert Osterbur, graduate assistant, developed the data for estimating demand for and supply of opportunities in farming.

JOHN F. TIMMONS is professor of agricultural economics, Department of Economics and Sociology.

tended to maintain existing sizes of farms in terms of acres. Subsidy programs have set minimum and maximum payments to individual farmers either through acreage or commodity bases or through total payments. Credit programs, likewise have limited amounts of loans to individual farmers in acquiring control of land resources. For example, the Farmers Home Administration, operating under the Tarver Amendment until 1947, limited loans to farm units below the average size (in acres) of farms in the community. A similar limitation remains in effect under the \$32,000 farm loan limitation. Educational programs such as Smith-Hughes and 4-H Clubs, have emphasized almost exclusively farm projects and preparing participants in the programs to remain in farming. Various other measures consisting of payments and loans for immediate purposes of income improvement, resource investment and production control have had the effect of freezing human resources in farming and obstructing their movement out of farming. Most of the adjustments in farm size and scale of operations and in numbers of farms and farmers that have come about in furthering technological and economic progress in agriculture have been hampered by agricultural programs.

This situation poses a challenging problem for everyone interested in the progress of agriculture and the national economy in which agriculture is an important sector. Are there values in maintaining a numerous farm citizenry which transcend the economic values of increasing size of farm and decreasing numbers of farms and farmers? If such values redound wholly to individual farmers, presumably the individual farmers would be willing to forego economic returns commensurate with the noneconomic values derived from farming as a way of life. If, on the other hand, the values of maintaining a numerous farm population as an essential "backbone of our democracy" redound upon our society in general, presumably the entire nation would be willing to help bear the costs involved.

Arguments against increasing size of farms and decreasing numbers of farms and farmers frequently rest on the idea of maintaining the "family farm." Correlative arguments embrace the possibility of farming providing job opportunities for most if not all farm youth. Farm parents usually like to think of farming in terms of providing opportunities for their two, three or four sons; even though their home farm is too small for even one operator to participate fully in the technological and economic progress which is potentially possible. Implica-

tions that economic progress in farming demands fewer and larger farms bring reactions that farmers are being "plowed under" and that the backbone of American democracy is being weakened. Legislators frequently reflect this thinking; albeit legislators may have a personal interest in supporting the population of their districts in terms of office security. Even rural educators may lament the fact that only one in five of their college graduates returns to the farm.

THE FAMILY FARM IN AGRICULTURAL ADJUSTMENT

The family farm argument runs something like this.

"The family farm is both an economic and a social institution. It does not stand or fall, therefore, on the basis of economic efficiency alone. It survives in part because it is socially efficient. The family farm is not only an economic organization helping to feed and clothe non-agricultural people, but it is also a social institution engaged in producing the kind of people and the kind of social values which make a society strong and secure."²

What lies behind the philosophy that economic progress in farming, entailing larger farms and fewer farms and farmers, is in conflict with other values essential within a democratic society? What are these other values? Are family-size farms and efficient-size farms in conflict? If so, how may these conflicts be reconciled in developing a dynamic and progressive farming society? How many farm youths may expect to find job opportunities in farming? How serious is the imbalance created by the relatively high farm birth rate and the declining number of opportunities in farming? How do these trends create obstacles to agriculture's capacity to adjust? How may these obstacles be ameliorated? The answers are not blessed, or cursed, with mathematical certitude. Nonetheless, the general sweep of the answers, gained from a careful review of ideas and limited data, appears unmistakable.

GENESIS AND DEVELOPMENT OF THE FAMILY FARM CONCEPT

Since the formation of this country and down through the years of our national existence—and currently in the congressional discussions of farm problems—men argue that the American form of government requires the preservation of the small, owner-operated, family-sized farm. The argument embraces the general idea that somehow or other the fate of American democracy is tied up with the structure of the agricultural community from which or with which it emerged.

Actually, the argument began much earlier. In the Fourth Century B.C., Aristotle was deeply involved in the genesis of the family farm concept.³ Later on, Cicero continued the development of family farm philosophy.⁴ It remained, however, for Thomas Jefferson to develop a full blown concept of the family farm.⁵

² C. Horace Hamilton. Social implications of the family farmer. In Ackerman and Harris. Family farm policy. University of Chicago Press. 1947. p. 110.

³ Aristotle, *Politics*. 347 B.C.

⁴ Cicero, *De Officiis* I, XLII, Loeb Translation, p. 155.

⁵ The Jeffersonian ideal of farming is summarized in two of his letters to John Jay and James Madison: Thomas Jefferson, Letter to John Jay, August 23, 1785. *Writings*. Vol. IV, pp. 449-50; and Thomas Jefferson, Letter to James Madison, December 20, 1787. *Writings*. Vol. V, p. 374.

Most of the important land acts down through the years have felt the impact of Jefferson's reasoning. Starting with the initial Land Credit Act in 1820,⁶ and continuing through the Pre-emption Act of 1841,⁷ the Homestead Act of 1863,⁸ the Reclamation Act of 1902,⁹ the Federal Land Bank Act of 1916,¹⁰ and the Bankhead-Jones Farm Tenant Act of 1937,¹¹ national farm legislation has been directed toward the establishment and maintenance of family-size farms in the Jeffersonian tradition.

Platforms of the major parties, major pieces of farm legislation and recent economic reports of the President all include statements of policy on "preserving the family-sized farm."

Thus, the concept of family farms is deeply embedded in American thinking and agricultural policies; however, the term "family farm" means many different things to many people. Our next step is to develop a specific meaning of the family farm and then endeavor to appraise it as interpreted and in light of existing data.

NATURE AND APPRAISAL OF FAMILY FARM CONCEPT

As developed in the literature, in policy pronouncements, in legislative acts and in implementing programs, the family farm concept has two aspects. One refers to the size, composition and organization of the operating unit of agricultural production. The other refers to the tenure of the operator in terms of his ownership equity in the resource he uses. These two aspects, the operation unit and the tenure unit, have been confounded and confused both in the family farm concept and in implementing policies and programs.

It is necessary to keep the two aspects separate in appraising the family-size farm. The reason for this separation is that operating units can fulfill objectives of family size farms from an economic viewpoint independently from the tenure under which the *operation of the farm* takes place. Thus, family-size farms may be identified independent of the tenure of operation.¹² This study limits consideration to the operating unit (economic) concept which is more relevant to the number and size of farms and the number of people engaged in agriculture.

Two kinds of criteria for indentifying family farms appear most often in the literature. These criteria are (1) that the operator and his family manage the farm and (2) that they supply half or more of its labor force.¹³ The application of these criteria cannot be made entirely precise and fixed. Thus, the criteria provide the flexibility needed in dealing with family farms which are

⁶ Sale of farmland for credit to operators was initiated. Previously all sales were for cash.

⁷ Settlers were given first chance to buy the land on which they settled.

⁸ Free land to settlers was initiated provided certain conditions were met regarding bona fide farmers.

⁹ New lands were developed through irrigation for family sized farms.

¹⁰ Amortization, low interest and long terms were introduced into credit purchases.

¹¹ Introduced 100-percent loans, 40-year payment period, variable payments plus prepayments, borrower selection and professional guidance and technical supervision features into farm credit purchases.

¹² This reasoning should not be interpreted that tenure arrangements under which farms are controlled and operated, are unrelated to adjustments in farming. On the contrary, tenure arrangements embracing farm transfers within and between families, land values and farm credit, inheritance, and farm leases are intimately related to farm adjustment. In fact, tenure arrangements are crucial means through which adjustment may be facilitated or obstructed depending upon the nature of tenure arrangements and the adjustments to be achieved. But this subject is outside the scope of this paper.

¹³ These criteria are currently being used by the National Planning Association in their appraisal of family farming. The report of this appraisal is in process of publication.

usually in transition. Families themselves change. Children are born, grow up, and leave or remain on the farm. Parents age and their work contributions change. Young farmers require management assistance from parents or landlords. Older farmers require hired labor during sickness and declining health. Most farmers require some hired labor during peak labor periods or for special jobs. Over the years, however, a farm might be expected to meet these criteria to be considered a family farm. Thus, the family farmer may operate as a tenant, as a full owner or as a part owner, part or all of the time.

Before making an appraisal of family-size farms, it appears desirable to draw some tentative conclusions concerning their noneconomic values.

Contrary to Jeffersonian reasoning, our American democracy continues to flourish with 9 out of 10 citizens in nonfarm occupations as contrasted with the reverse proportions in the late 18th Century. Furthermore, contrary to Marxian reasoning that democratic capitalism would crumble first in the highly industrial nations because of conflicts between laborers and capitalists, the reverse has happened more often. Totalitarian communism has developed more often, more rapidly, and more completely in agrarian societies rather than in industrial nations. For example, Russia in 1917 and China in 1947 counted three-fourths and two-thirds, respectively, of their populations as farm people. Defects in agrarian structures provided the major medium for communist expansion.

Although it is extremely difficult to evaluate the "backbone of democracy" values attributed to farming, neither historical evidence nor the reasoning of Jeffersonians on this point seem to bear out the thesis in a positive manner.

Unless and until more proof than is now apparent is brought to the support of the family farm theory of democracy, it appears doubtful that sacrifices in efficiency to make farms and farmers more numerous are warranted from a social viewpoint.

MEASURING FAMILY-SIZED FARMS

Returning to the management and labor criteria for identifying family farms, certain relevant data are taken from the 1950 U. S. Census of Agriculture. For each 1,000 males in the United States gainfully employed in agriculture, 614 were full or part owners, 226 were tenants and 159 were farm laborers (at least 150 days). Most of the 614 farm owners probably exercised sufficient management control over their farm operations to meet the management criterion of a family farm. An estimated two-thirds of the tenants would qualify likewise, leaving 75 tenants and 159 farm laborers who lacked the manage-

ment responsibility of family farmers. Comparable data estimated for Iowa shows that for each 1,000 males 561 were full or part owners, 348 were tenants and 91 were farm laborers. Applying similar reasoning to the Iowa data,¹⁴ it would appear that the 561 owners and two-thirds of the tenants (232) would exercise sufficient management control to be termed family farmers, leaving only the 91 laborers and one-third of the tenants (116) outside the family farm group.

Regarding the labor criterion of family farms, most of the nation's farms would qualify. In 1954, about half of all farms reported no hired labor.¹⁵ Earlier studies for 1947 and 1948, showed four-fifths of the nation's farms reported the equivalent of 3 man-months or less of hired labor.¹⁶ Only 3 percent of the nation's farms employed two laborer equivalents on a yearly basis. Only 1 percent of the total farms employed equivalents of four or more laborers per year.

From these data on management and labor, we might conclude that an overwhelming majority of the nation's farm operators are family farmers, and about two-thirds of all gainfully employed agricultural workers are family farmers. For Iowa, even larger proportions of operators and workers fall into the family farm group based on the management and labor criteria.

For the United States, about 29 out of each 30 farms would qualify as family farms from the labor criterion and 11 out of 12 from the management criterion. The proportions in Iowa are even higher for both criteria.

Beyond management and labor considerations, family farms may be viewed from their output and income. Most students of family farms agree that family farms should provide enough income to meet at least the minimum requirements of an adequate level of living for the farm family. What is an adequate level of income? The median income for all families in the United States in 1954 was \$4,173. About three-fourths of the families in the United States varied less than \$1,600 either way from this median. Thus, if we took the lower range of this variation, we would have a minimum of around \$2,500 net income which might be regarded as a minimum requirement of an adequate level of living.

Through this reasoning, and qualified for its many inherent weaknesses, the economic classes of farms provided in the 1954 Census of Agriculture may be reviewed in terms of adequacy of family farms (table 1).¹⁷

¹⁴ 1950 Iowa Census of Agriculture.

¹⁵ 1954 U. S. Census of Agriculture.

¹⁶ U. S. Dept. Agr., Bureau of Agricultural Economics. Wages and wage rates of hired farm workers, April and September, 1948. U. S. Dept. Agr. Report 22. May 1950. Table 31.

¹⁷ For a more detailed presentation of economic classes of Iowa farms, see: Wunderlich, Gene and Timmons, John F. Iowa farm size continues up! Iowa Farm Sci. 11:343-346. Oct. 1956.

TABLE 1. ECONOMIC CLASSIFICATION OF FARMS FOR UNITED STATES AND IOWA, U. S. CENSUS, 1954.

Economic class	Value of products sold (\$)	Number of farms		Percent of farms	
		United States	Iowa	United States	Iowa
Commercial					
I	25,000 or more	134,000	10,302	2.8	5.2
II	10,000-24,999	449,000	52,164	9.4	27.0
III	5,000- 9,999	707,000	59,884	14.8	31.0
IV	2,500- 4,999	811,000	33,818	17.0	17.5
V	1,200- 2,499	763,000	15,430	15.9	7.9
VI	250- 1,199	462,000	6,640	9.7	3.4
Part time*	250- 1,199	575,000	7,315	12.0	3.8
Rural residences	Less than 250	879,000	7,340	18.4	3.8
Abnormal†		2,000	116	—	0.4
		4,782,000	193,009	100.0	100.0

* Operator reported 100 days or more of off-farm work or operator and his family received income from off-farm work exceeding value of all farm products sold.

† Includes experimental farms, institutional farms, etc.

TABLE 2. ECONOMIC CLASSES REGROUPED BY ADEQUATE, INADEQUATE AND NONFAMILY FARMS.

Groups	U. S.	Number		Percent	
		Iowa	U. S.	Iowa	
Group 1. Adequate family farms (classes I, II and III)	1,290,000	122,350	27	61	
Group 2. Inadequate family farms* (classes IV, V and VI)	2,036,000	55,888	42	28	
Group 3. Nonfamily farms (part time, rural residence and abnormal)	1,456,000	21,295	31	11	
Total	4,782,000	199,533	100	100	

* Assuming that net farm income was roughly half the total value of products sold, Class IV in table 1 would fall into Group 2 in table 2 since no farms in this group would yield the \$2,500 net income taken as a minimum for the adequate family farms. It appears likely from USDA and Iowa studies of farm records for 1954 that the ratio of net to gross income is considerably less than one to two. Thus, there would appear to be little doubt but what the Economic Class IV farms would fall into Group 2 of table 2 under the assumptions used in the grouping.

The economic classes of farms shown in table 1 may be summarized into the groups indicated in table 2 for the United States and Iowa.

According to the groupings of farms made in table 2, only 27 percent of the farms in the United States and 61 percent of the farms in Iowa would be considered as adequate family farms.¹⁸ This leaves 42 percent of the United States farms and 28 percent of the Iowa farms as inadequate family farms and 31 percent of the United States farms and 9 percent of the Iowa farms as non-family farms. These estimates are very crude but are indicative of the remedial conditions required for family farms consistent with the adjustments in agriculture necessary for economic progress as stated earlier in this study.

In Iowa the 28 percent of the state's farms grouped as inadequate require adjustments to increase their productivity. Although the types of cross classification, in terms of resource productivity of these farms, are not available in census reports released thus far, it would appear that the major remedy involves a consolidation of these farms with each other or with the adequate family farms in Group 1.

For the Group 3, nonfamily farms, the situation is quite different. These farms are not really farms but rather are rural residences of urban workers who work over 100 days per year off the farm.¹⁹ In addition to providing rural residences for urban workers, these farms are a transition stage through which farm operators are gradually turning to nonfarm employment. As the state of Iowa becomes increasingly industrialized, Group 3 may be expected to grow in numbers. Its chief contribution to farm adjustment is (1) the provision of a rather painless transition from farm to nonfarm employment and (2) acquisition of farmland by nonfarm workers for residences, recreation and hobbies thus removing land from

¹⁸ There may be some question as to whether the Class I farms should be included as family farms. These farms were omitted from the family farm group in a recent USDA study (McElveen, Jackson V. Family farms in a changing economy. U. S. Dept. Agr., Agr. Inf. Bul. 171. 1957). However, the Class I farms reported the gross value of products sold in 1954 as over \$25,000 per farm, and the net income would be considerably less. In 1954 there were 10,317 of these farms in Iowa, constituting 5.2 percent of all farms. Most of these farms appeared to be family-sized farms in terms of the management and labor criteria used in this paper. At any rate, it did not appear desirable to exclude the entire group just because the gross income exceeded \$25,000. Rather, the procedure used in this paper brought the Class I farms into the consideration of family farms and then made exclusions on the basis of management and labor criteria according to the preceding analysis.

¹⁹ For more detailed discussion of these farms, see: Wunderlich, Gene and Timmons, John F. Iowa's "farms in name only." Iowa Farm Sci. 11:363-364. Nov. 1956.

agricultural production.²⁰ This group of farms and farmers is deserving of much more study in Iowa than has been the case to date.²¹

Thus far, evidence—fragmentary and incomplete as it is—indicates that the family farm, in terms of both the management and the labor criteria, has demonstrated remarkable ability in adapting itself to agricultural change. Probably the major reason for this adaptability lies in the very nature of technological and economic progress wherein the ratio of capital and land to a unit of labor and management is ever widening. The main problem in terms of per capita income of farm people appears to be reflected in too many inadequate rather than too few adequate family farms.

ADJUSTING FARM POPULATION TO OPPORTUNITIES IN FARMING

The persistent natural increase in farm population and the consistent decrease in number of farms present an imbalance in the supply of and demand for opportunities in farming. Knowledge of the nature and magnitude of this imbalance as estimated for future years is a necessary foundation for advising farm youth on vocations and for redirecting agricultural programs of education, utilities, transportation, credit, production control and subsidy.

For example, if only 20 opportunities in farming are to become available in a particular county in any one year and if natural population increase results in 50 farm male youths becoming of occupational age in the county each year, then 30 of these youths should be trained for and guided into nonfarm jobs or else find farming opportunities in other areas. Presumably, however, the same situation exists in other areas (with but few exceptions) so that 30 youths per year must find nonfarm employment. If those youths are motivated and trained only for farming, they may experience serious frustrations and disappointments in finding a job befitting their capabilities and interests.

THE NATURE AND MAGNITUDE OF POPULATION AND SIZE OF FARM ADJUSTMENT—AN EXAMPLE OF AN IOWA COUNTY

In consideration of this imbalance between supply of and demand for opportunities in farming and the serious problems engendered, the Iowa Agricultural and Home Economics Experiment Station is cooperating in a North-Central regional study of this problem. An example of the analysis under way is presented in tables 3 and 4 for Clarke County.²²

Several factors affect the supply of and demand for farming opportunities. These factors are: (1) change in total area of commercial farmland, (2) change in size

²⁰ Of course, part-time farmers and rural residents do produce a certain amount of farm products for home consumption and for the market. However, this production appears to be relatively negligible.

²¹ A study in process in Ohio indicates that part-time farming is a preferred rather than a transitional status for an increasing number of people. Increased leisure time resulting from reduced work weeks of urban people, coupled with improved arterials leading to and from urban employment and bus transportation for school children contribute to the expansion of part-time farming and rural residences.

²² Clarke County is used as an example in this paper. The studies from which this example is taken, embrace Iowa's 99 counties.

TABLE 3. SUPPLY OF AND DEMAND FOR FARMING OPPORTUNITIES BETWEEN 1950 AND 1975 FOR CLARKE COUNTY, IOWA, ASSUMING FARM SIZE INCREASE OF 4.4 ACRES PER YEAR (COMMERCIAL FARMS).

	Com'l farm acres(a)	Ave. farm size(b)	No. farms	Total operators(c)	Hired labor(d)	Total opportunities(e)	Decrease in opportunities(f)	Age group	Rural farm males(g)	Dying before 19(h)	Farm opportunities made available by				Surplus(k)	Percent surplus(l)
											Dying after 19(i)	Retirement	Migration(j)	Total		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
1950.....	249,654	195	1,281	1,319	176	1,495	234	14 to 18	200	1	75	60	119	254	179	90
1955.....	249,654	217	1,146	1,180	81	1,261	146	9 to 13	197	2	75	37	110	222	119	60
1960.....	249,654	239	1,044	1,075	40	1,115	110	4 to 8	221	3	73	36	104	213	115	52
1965.....	249,654	261	957	985	20	1,005	87	-1 to 3(m)	242	6	67	38	94	199	124	53
1970.....	249,654	283	882	908	10	918	70	-6 to -2(m)	256	7	65	33	93	191	128	51
1975.....	249,654	305	819	843	5	848										
							647		1,116	18	355	204	520	1,079	665	60

^a Total acres in commercial farms assumed constant—estimate based on 1950 Agriculture Census data.
^b Increase of 4.4 acres per year in average size of farm—based on 1950 and 1954 Agriculture Census data.

^c Assumption of 1.03 operators per farm (partnerships, multiple operatorships).
^d 1950 and 1955 hired labor opportunities based on Agriculture Census data, 150 days or more; continuation of trend assumed, i.e., 50 percent of each previous total.

^e Total opportunities—column 6 (column 4 plus column 5).
^f Decrease in opportunities in successive 5-year periods.
^g Population Census, 1950, Clarke County, Rural Farm Males, estimated number on commercial farms.

^h Estimates of deaths based on rates in Vital Statistics of the United States 1954, Vol. I., U. S. Dept. Health, Education and Welfare.

ⁱ Death rates same source as footnote h.
^j Migration estimates based on rates for Economic Subregion 71 (Farm population. U. S. Dept. Agr. Stat. Bul. 176. Washington, D. C. June 1956).

^k Surplus of farm youths reaching age 19 if demand for farm opportunities is to be brought into balance with supply.

^l Percentage of numbers in column 9 regarded as surplus.
^m Minus numbers indicate that in the year 1950 these age groups were not yet born and values are estimated.

TABLE 4. SUPPLY OF AND DEMAND FOR FARMING OPPORTUNITIES BETWEEN 1950 AND 1975 FOR CLARKE COUNTY, IOWA, ASSUMING FARM SIZE INCREASE OF 8.8 ACRES PER YEAR (COMMERCIAL FARMS).

	Com'l farm acres(a)	Ave. farm size(b)	No. farms	Total operators(c)	Hired labor(d)	Total opportunities(e)	Decrease in opportunities(f)	Age group	Rural farm males(g)	Dying before 19(h)	Farm opportunities made available by				Surplus(k)	Percent surplus(l)
											Dying after 19(i)	Retirement	Migration(j)	Total		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
1950.....	249,654	195	1,281	1,319	176	1,495	284	14 to 18	200	1	75	60	119	254	199	100(m)
1955.....	249,654	239	1,044	1,075	136	1,211	197	9 to 13	197	2	75	37	110	222	170	87
1960.....	249,654	283	882	908	106	1,014	144	4 to 8	221	3	73	36	104	213	172	79
1965.....	249,654	327	763	786	84	870	110	-1 to 3(n)	242	6	67	38	94	199	147	62
1970.....	249,654	371	673	693	67	760	82	-6 to -2(n)	256	7	65	33	93	191	140	56
1975.....	249,654	415	601	619	59	678										
							817		1,116	18	355	204	520	1,079	828	74

^a Total acres in commercial farms assumed constant—estimate based on 1950 Agriculture Census data.
^b Assumes average farm size increase of 8.8 acres per year which is twice rate of table 3.

^c Assumption of 1.03 operators per farm (partnerships, multiple operatorships).
^d 1950 and 1955 hired labor opportunities based on Agriculture Census data, 150 days or more; continuation of trend assumed, i.e., 50 percent of each previous total.

^e Total opportunities—column 6 (column 4 plus column 5).
^f Decrease in opportunities in successive 5-year periods.
^g Population Census, 1950, Clarke County, Rural Farm Males, estimated number on commercial farms.

^h Estimates of deaths based on rates in Vital Statistics of the United States 1954, Vol. I., U. S. Dept. Health, Education and Welfare.

ⁱ Death rates same source as footnote h.

^j Migration estimates based on rates for Economic Subregion 71 (Farm population. U. S. Dept. Agr. Stat. Bul. 176. Washington, D. C. June 1956).

^k Necessary migration to come from youths reaching age 19 in order to bring demand for farm opportunities into balance with supply. Surplus of farm youths reaching age 19 if demand for farm opportunities is to be brought into balance with supply.

^l Percentage of numbers in column 9 regarded as surplus.
^m For first 5-year period none of column 9 would expect to find opportunity; additional migration (column 13) of 30 actually needed.

ⁿ Minus numbers indicate that in the year 1950 these age groups were not yet born and values are estimated.

of farms, (3) farm birth rate, (4) migration of active operators and laborers, (5) migration of farm youths before reaching beginning age of permanent employment, (6) retirement of farm operators and (7) deaths, all ages.

Tables 3 and 4 are attempts to estimate supply and demand conditions in future years under alternative sets of assumptions. Estimates are made of the number of male farm youths who need to migrate in successive 5-year periods in order to equate the number of farm males with the available opportunities. Table 3 assumes an average farm size increase for *commercial farms* of 4.4 acres per year, as based on 1950 and 1954 census data. Table 4 considers a farm size change of 8.8 acres per year or twice the rate of increase of table 3. A further change in assumption regarding the effect on hired labor is footnoted in column 5.

According to table 3, 665 out of 1,116 farm male youth reaching age 19 before 1975 will need to migrate²³ because of lack of opportunity in farming. The basic assumptions underlying this statement in addition to the farm size increases are that (1) acres in commercial farmland remain unchanged,²⁴ (2) opportunities for hired labor will be as stated in footnote d of the table, (3) farm youth enter active employment at age 19 and (4) farm opportunities will continue to become available, through migration, retirement and death of operators, *at the same rates as prevailed in the 1940-50 period*. Migration of young men at age 19 or soon thereafter is then the residual factor which allows the demand for farm opportunities to come into balance with the supply.

For example, for the period 1950-55, column 7 shows a decrease of 234 opportunities due to a decrease of farms (column 3) plus decrease of hired labor (column 5). During this same period 200 farm males, representing potential demand, reach age 19. These two effects are partially offset by the 254 opportunities made available through retirement, death and migration (column 14). Column 15, surplus of male farm youths of the original number in column 9, is the result of column 7 (234) plus column 9 (after subtracting for deaths, column 10) minus column 14 (254) or 179 additional males as excess from the 19-year age group. For the first 5 years, this is an average of 36 per year, 24 for the second 5-year period, 23 for the third, 25 for the fourth and 26 for the period from 1970-75. The average for the entire period from 1950-75 is 27 farm male youths per year. Percentages of excesses are shown in column 16. The over-all excess for the 25-year period is 60 percent or three out of every five farm youths.

Table 4 gives the results of increasing size of farm at the rate of 8.8 acres per year plus a slower rate of decrease of hired labor opportunities. Assuming other conditions to be the same, the estimated excesses appear in column 15. Thus, 828 farm boys or an average of 33

each year, would have to find jobs outside of farming. Considering the quinquennial periods, yearly "surpluses" of farm youth are as follows: 1950-55, 40; 1955-60, 34; 1960-65, 34; 1965-70, 29; and 1970-75, 28. This is an average of 74 percent or three out of every four over the 25-year period.

TOWARD ADJUSTMENT

The direction of a major adjustment in farming has been emphasized in this and other basebook papers. This direction is toward fewer farms and farmers and toward movement of farm people to nonfarm employment. Agriculture's capacity to make this adjustment is being limited by a number of factors. Factors limiting adjustment emphasized in this article include (1) increases in farm population exceeding farming opportunities becoming available, (2) obstacles preventing farm people from shifting to nonfarm employment, (3) size of farm patterns failing to keep pace with technological improvements in farming and (4) the family farm concept of democratic values, which tends to hold people in farming.

In an effort to appraise the nature and magnitude of the adjustment toward fewer farms and farmers and toward movement of farm people to nonfarm employment, studies are being made by counties designed to estimate the demand for and supply of farming opportunities under various assumptions. An example of these studies was outlined with respect to one county. These studies estimate the number of farm youths who would be expected to leave the county and seek employment elsewhere. Such estimates appear necessary to provide a foundation for agricultural adjustment.

These estimates of farm youths and opportunities in farming should be particularly helpful in providing training and occupational goals for farm youth. Although people of all ages migrate from farms, the high school and immediately following high school age groups provide the greatest possibilities for migration.²⁵ It appears that efforts to facilitate further movement off farms should be directed toward this segment of the farm population through (1) providing training for nonfarm occupations, (2) providing the nature of opportunities in farming and other occupations for youths to consider and (3) helping youths to obtain nonfarm employment or further training for nonfarm occupations. These three steps toward migration may also be extended to older farmers in appraising their alternative opportunities more fully.

Such estimates of farming opportunities should not only be useful in educational programs, but, likewise should be helpful in credit and production control programs and in planning schools, roads, rural electrification and other improvements for farm communities. Such improvements are made for future as well as present farm communities, and estimates of future beneficiaries are important in planning the improvements.

²³ Migration in this sense means only lack of opportunity in farming according to the specific assumptions. Success in locating local employment would enable individuals to remain in the same community.

²⁴ Further refinements in this assumption are being developed in terms of agricultural land being diverted into highways, residential, industrial and other nonfarm uses.

²⁵ Farm population. U. S. Dept. Agr. Special Bul. 176. Washington, D. C.

Factors Influencing Agricultural Adjustment

BY A. GORDON BALL

AN IMBALANCED relationship among sectors of an economy results in less than optimum efficiency in the use of resources entering production and causes distortions in kind, emphasis and quantity of national output. The problems that plague modern agriculture are, in essence, the result of an imbalance in the relationship between agriculture and the other sectors. The imbalance has arisen because the adjustments made in the use of resources in agriculture have not been in keeping with changing conditions of supply and demand in our economy.

Reduced real income to farmers, falling gross farm incomes, rising costs of production and excess supplies of farm commodities bear evidence of the acute and serious nature of the problem. The solution involves more than treating the most recent symptoms—for the imbalance is not all of recent origin. At least two of agriculture's chronic ailments, instability of income and underemployment, indicate that the maladjustment is of long standing. The current severity of agriculture's plight is more the result of an aggravation and worsening of the imbalance than it is of anything new.

Because there is at this time a greater awareness of the effects of the maladjustment on agriculture than of its causes, there may be a tendency to expect to find and to look for a solution only within agriculture. This will not suffice. Agriculture does not operate in isolation but as a part of the whole economy. The problem of its adjustment is not exclusively internal, nor exclusively external, but some of each.

If the present imbalance is to be corrected or improved in an orderly fashion within a reasonable time, agriculture must assume some of the responsibility. In other words, unless some changes are made within the agricultural industry itself, any such improvement must come entirely as the result of adjustments made in other sectors of the economy. But relatively few changes external to agriculture are specifically directed toward correcting or preventing problems within agriculture. Furthermore, changes in nonagricultural sectors may worsen, rather than better, the situation for agriculture, and they are not predictable as to timing or to the form they take.

To determine the possible forms and areas of needed adjustment to improve the situation in agriculture, it should be helpful to examine factors that influence changes. Some of the major ones are: the structure of

the agricultural industry; the pricing system; costs in farming; government programs; risk and uncertainty; lack of knowledge; lack of training; cost of transfer; inertia and psychic considerations.¹

THE STRUCTURE OF THE AGRICULTURAL INDUSTRY

The organizational structure of the agricultural industry has an important bearing on both the kinds of adjustments that are made and the rate at which they are made. There are millions of farm units and millions of farm managers. The managers act as individuals, and the units are operated as entities. Control of the industry, its production and its welfare is, therefore, vested among millions of individuals.

There is no hierarchy of command or responsibility in agriculture nor any large centralized sources of capital to finance changes such as are found in many nonagricultural industries. In these latter industries, only relatively few top officials need decide on a change to have it adopted at a specified rate with consequent, and to some extent predictable, effects on competitors and the industry as a whole. Agriculture, on the other hand, lacks the top officials with authority and responsibility to make decisions that affect the group or that modify total production. Its changes are determined by the masses of farmers, each operating in his own interest and concerned chiefly with the short-run. Any one farmer's decision has no significant effect on the whole industry, and thousands must make a decision similar to his before a change becomes generally adopted.

Obviously, the nature of the industry does not facilitate quick changes, changes of a long-run nature, changes of group concern, or those needed to improve the welfare of the industry as a whole. In essence therefore, agriculture does not have an effective mechanism to incorporate changes in the proper sequence and combinations or with appropriate timing to maintain or improve its relative position among the various sectors of the economy. In consequence, the agricultural industry's relative position in the economy may actually worsen during a period when several kinds of needed adjustments in it are taking place.

With the segmentation and lack of internal organization that exists in agriculture, most of the changes re-

A. GORDON BALL is associate professor of agricultural economics, Department of Economics and Sociology.

¹Other important social, familial and institutional influences on the kind and rate of adjustment exist also but are not included in this presentation. They are considered elsewhere in other discussions on this topic.

quired to bring the industry into better adjustment will be initiated by agencies with an interest in the over-all welfare of agriculture. Governments and educational institutions particularly, with their facilities to evaluate the problems, to propose changes and to present alternatives and their probable consequences, are in a position to help.

THE PRICING SYSTEM

In our economy producers are, in general, expected to make whatever changes are necessary to keep output geared to demand for the product. There is no doubt that it is difficult for producers anywhere in the economy to translate a change in price to a course of action that provides the adjustment needed. Whether the occasion is a drop in demand for large automobiles or corn, the producer must decide if the change is (a) a minor fluctuation of no particular significance, (b) of such short duration that production adjustments are impossible, impracticable, unprofitable or unnecessary, or (c) of sufficient duration and significance to require action, and if so, what kind.

The segmented structure of the agricultural industry, lacking as it does any centralized authority, coupled with variations in both the domestic and foreign demand for its products, makes adjustments for the industry less direct, more complex and more difficult than for most others. It is doubtful that many farmers are able to fully understand and correctly interpret price changes as to duration and significance. It is idealistic to expect that an individual farmer can *consistently* make wise decisions on the course of action that he should take both (a) to maintain or increase his income and (b) to assist the adjustment needed in the industry. For improving his own income can, and often will, be in conflict with what will most assist agriculture as a whole. Increasing the yield per acre of corn or participating in some government programs for increased income during a period of surpluses illustrates the conflict mentioned.

A price change may be either in the selling price of the product or the cost price of an input. Actually, the selling prices of several products a farmer produces may be fluctuating at the same time—some up and some down. Simultaneously, the cost to the farms of inputs for these or other products may be changing also. Since the profit is determined by subtracting costs from the value received for a product, great turbulence in the prices of either inputs or outputs causes uncertainties of, and often large fluctuations in, his income.

Farmers cannot increase the price for their products. They must accept the price that prevails. Their only recourse to an unfavorable selling price is to change the emphasis in future on the quantity of products produced. When input prices alter, farmers find it advantageous to use more of the inputs whose prices have fallen.

The pricing system, therefore, is the mechanism that allocates income to farmers. It is a complex mechanism, made up of changing components that are difficult to predict. The pricing system is often characterized by sudden and large fluctuations in the cost of inputs and/or the selling price of farm products. While sudden changes that reduce farmers' incomes make it increasingly difficult

or impossible for the inefficient farmer to survive, they are equally devastating to an efficient farmer who has large fixed costs that were assumed under more favorable conditions.

Thus, the pricing system may not only eliminate the inefficient farmer but also beginning farmers or others in a vulnerable economic position. Additionally, the process may be so sudden and so drastic that no orderly transition to a more favorable position on the part of the farm family is possible. The pricing system, therefore, during sudden violent swings that affect farmers adversely may act as a destructive force rather than one that serves only as an indicator of adjustments needed to maintain income and secure the future.

Farm incomes resulting from the unfettered functioning of the pricing system would, therefore, fluctuate greatly and suddenly in size over time. There would not, of course, be farm surpluses—for the selling price of farm products would drop until the products were sold at prices the consumers were willing to pay.

For many years attempts have been made in our economy to maintain the basic desirable characteristics of our pricing system while improving it in ways that reduced the suddenness and extent of fluctuations. Such participation is intended also to provide farmers a greater degree of price and income stability and certainty. In this regard, we have, perhaps, in some instances gone too far, in some not far enough, and in others we have used the wrong tools or none at all when some were needed.

COSTS IN FARMING

Variations in the costs of farming serve as indicators of the adjustments that should be made or are forthcoming in farming. First, there are relative costs. Since profit is the difference in selling price and cost price of what a farmer produces, he should be interested not only in the absolute size of the selling price but also in the absolute size of the cost and in both considered together. In other words, he should regard any absolute change in either the selling price or cost price of inputs as an indication that he should estimate the significance of the change on his immediate, short-run and long-run prospects for profits from production of the product concerned. The farmer can do little to effect a change in the selling price of a product since so many other farmers are involved in producing the same product.

However, the costs of inputs are more within his control for they depend to some degree on his method of management. To the extent that an individual farmer can reduce his costs of producing hogs by \$2 per hundred-weight, his profits are increased by the same amount as if the selling price of hogs increased by \$2 per hundred-weight. If there is a 10-percent reduction in selling price but farmers' costs of production can be reduced by 12 percent, more profits result than before the drop in the selling price.

Realistically, therefore, a farmer attempting to improve his income, will be interested in both increases in the selling price and in possible ways that his costs of production can be decreased by improved methodology and management. When price swings occur in the costs of production or in the selling price, the farmer must then decide—after evaluating the effects of the changes on

his profit prospects—whether he can reduce his costs of production. When he has decided what are his lowest costs of production, he must decide, in the light of the selling price, what if any profits he can expect from his present level of production and whether or not he should continue that level of production, increase it, decrease it or withdraw from production entirely.

If farmers determine production on the basis of selling price with little or no regard to changes in costs of production, and if costs could be reduced, the efficiency of farm production could be improved. If, on the other hand, farmers cannot reduce their costs of production but costs of inputs rise without comparable increases in selling price, the percent return on the inputs used in production are thereby decreased; perhaps, enough to warrant a shift in production. The farmer who disregards relative cost changes will become aware of his increasingly deteriorated or improved position, at best, only after much valuable time has been lost for planning and taking adjustive action.

The second set of costs that determine farm incomes and security and which act as indicators of changes to be made are fixed costs and variable costs. When added, they give total costs. Fixed costs are those that do not change whether production is increased, decreased or eliminated. Variable costs are those that alter as production is increased, decreased or discontinued. Consideration will be confined here to the pertinence of these costs to the process of adjustment.

The farm family has as fixed costs in the next period any cost commitments of the past that must be paid—whether the farm is left idle or whether production yields are high or low. Therefore, essential costs of consumption, payments on all items bought on time, insurance, taxes and many other costs fall in this category. The total of these fixed costs indicates the amount of future income that is required before any can be reinvested in the farm business. Without reinvestment in the business, which serves as the “fuel” for the farm business machine, it follows that, in the future, there will be decreased income at first and finally no income.

Farm incomes, and more particularly the purchasing power of farm incomes, cannot be maintained, let alone increased, unless there is enough income to meet the fixed cost commitments of the present period plus enough for reinvestment in the farm business to provide sufficient income to meet both the fixed and variable costs of the following period. It is obvious that if fixed costs become so high that it is impossible for the farmer to take advantage of profitable uses of fertilizer, feed, labor and other variable-cost items with the result that he suffers a declining income, the decline is not only likely to continue in each successive period but to increase in amount.

The importance of the relationship can be understood more clearly when it is realized that increases may occur over time, not only in the variable costs for resources that enter into production, but also in the absolute size of fixed costs. In other words, not only may the costs of gasoline, seed, fertilizer and feed increase, but so may such fixed cost items as taxes, essential consumption, interest, insurance and so on.

The bearing of fixed and variable costs on the problem of adjustment is indeed great. Costs that must be met during future periods regardless of adversities or fortunes should bear a direct relationship to ability to meet them

and, at the same time, maintain a productive organization that will provide the income required in turn for the next period. Thus, increases in the cost of living, taxes and other fixed costs that are beyond the control of the farmer may increase his vulnerability and decrease his future income and purchasing power in exactly the same way as variations in the cost of variable inputs or the assumption by him of additional fixed costs. The effects that the assumption of additional fixed costs have on capital available for operating the farm in the next periods and on the income of future periods should be considered before they are incurred.

At present in agriculture, taxes, insurance, interest, cost of living and cost of most inputs are rising. In consequence, reckless assumption by farmers of additional fixed costs is hazardous, whether in the form of the purchase of a farm on easier credit terms, greater use of consumer credit or a new barn. Assumption of additional fixed costs is justified if there will also be sufficient capital available for reinvestment in future periods to yield an income that equals or exceeds the purchasing power of the present income.

Many farmers, rather than assuming additional fixed costs, should adjust to their rising costs of operation by farm reorganization, off-the-farm employment or a change in occupation.

GOVERNMENT PROGRAMS

Government participation in agriculture has taken many forms and had many objectives. The forms have varied from tariff protection and special tax concessions to price supports, marketing quotas and acreage controls. The objectives have the appearance of being in large degree unrelated to each other (Part III of the basebook will analyze these). The net results are that some programs originally designed to increase production by assuring farmers greater certainty of income and planning during an emergency and increased demand, are still in force when surpluses, decreased demand and still other programs intended to decrease agricultural production exist.

It is obvious that programs designed for one specific purpose, if appropriate, will be equally inappropriate when circumstances are reversed. Adding programs designed to counteract those in existence means not only additional overhead costs, but built-in reduction in the effectiveness of the programs added. Long-run over-all integration of all programs is needed.

Society should recognize that the increased production of farm products at lower cost resulting from encouragement of improved technology has increased total welfare. Under circumstances such as those at present, however, the benefits may accrue to society at the expense of the farmer. And increasing farm incomes through some types of government programs may simply delay adjustment. Society needs to concentrate on designing a positive policy to facilitate and accelerate the movement of resources out of agriculture to be equally as efficient as the forces that result in surplus resources in farming. Modification of government participation with this objective, rather than the opposite, in view is desirable.

The desirability of exercising some influence over the

kinds of technological improvements and the rate at which they are introduced into agriculture must be considered unless whatever adjustment is obtained is accomplished entirely on the side of moving freed resources out of the industry.

In brief, the problem of agricultural adjustment is to bring agricultural production into line with market demand. Improved levels of management and technology are output-increasing and result in the release of surplus resources within the industry which, unless they move out, bring further maladjustment.

There are three courses of action which can be followed to attain greater adjustment: (1) facilitation of the flow of resources out of agriculture only; (2) decreased emphasis on output-increasing developments only; and (3) combinations of the first and second. Decisions need to be made on society's objective—what degree of adjustment is desired, how is it to be obtained and what will be its net effects on agriculture and the economy as a whole?

RISK AND UNCERTAINTY

There are many variables in farming. Many changes made or not made in the agricultural industry stem from the fact that outcomes cannot be determined accurately in advance. Farmers, realizing that they must accept the results of actions taken, hedge against the risks and uncertainties.

There are uncertainties involved in price changes and in government programs. These have been discussed already. Still other risks and uncertainties exist in the form of new technology, obsolescence, yields, rates of growth and personal catastrophes of health or fortune.

The steps that a farmer should take to reduce uncertainties depend upon such things as his economic vulnerability and risk preference. No matter what his desire for the high rewards that may accrue to high risk enterprises in the long run or on the average, it is necessary to survive the periods of negative or low incomes in order to realize the long-run or average results. There must, therefore, be a balance between the desire for high returns and the ability to survive downswings.

Farmers use many techniques to deal with uncertainty: adjustment in estimates of returns to allow for risks or the uncertainty associated with an enterprise; combinations of enterprises to give a regular necessary minimum income as an extreme; insurance; insecticides; vaccination; sanitation; flexibility of building use, of costs incurred and of physical production; contracts for produce, or its sale; and various sharing arrangements.

There is a cost attached to practically all of the techniques that reduce uncertainty either directly, as in insurance or use of sanitation, or indirectly from the selection of an enterprise with lower and more certain income. Some of the net results of risks and uncertainties in agriculture are: (1) use of less credit, (2) lower but less fluctuating farm incomes, (3) increased production of products with low degrees of uncertainty even to the point of surpluses (such as in feed grains, hogs, poultry and dairy products); (4) smaller farm business organizations.

Risks and uncertainties have other effects on the

adjustment of agriculture. Farmers often view the risks and uncertainties attached to allocating resources to non-agricultural uses as greater than those associated with their use in agriculture. Hence, they may avoid or resist the transference of money out of uncertain or low-yielding areas of their farm business into higher yielding more certain areas outside agriculture. One reason for such action is lack of familiarity with opportunities outside agriculture so that nonagricultural opportunities are viewed with more uncertainty than is justified. Another reason is that farmers tend to keep all their capital in the one business with the hopes that the future will be more favorable.

The same is true of the human resource. There are many people in agriculture who rarely, if ever, consider their alternative income possibilities from part- or full-time pursuits outside agriculture. They often view the situations of higher incomes outside agriculture as temporary and uncertain. They believe that adversities to the employer would result in their unemployment and complete loss of income. They are sometimes uncertain of what is involved in living in the confinement of an urban area, of work conditions, the restrictions of labor unions or management and so on. There are many farmers therefore, whose incomes will have to drop much lower than those in alternative opportunities before they will seek employment elsewhere. Logically, however, farmers should expect and require a higher return from their business operations than from a salaried position, as a reward for the additional risks and uncertainties they assume in operating their business.

LACK OF KNOWLEDGE

When farmers lack knowledge of management, of what costs are involved in farming and the relationship between them, of the comparable returns they have been receiving and have prospects of receiving on resources used in various enterprises, or of returns from alternative opportunities outside of agriculture, they adjust differently, if at all, than they would otherwise. Lack of knowledge, therefore, constitutes a major obstacle to adjustment.

Farmers who do not know the process of making decisions and how to evaluate them may follow a pattern or make a few poor decisions that in effect counteract many good ones. For instance, without an awareness of new technology and its possible returns, farmers tend to make its adoption too late to realize the large returns that accompany early adoption of a successful innovation. Farmers who do not realize the ordering of returns from the enterprises in their farm operation may expand one that is yielding a lower return than one that they contract. Without knowledge of price relationships, no adjustment or ill-advised adjustment may be made to price swings. Lack of knowledge of the above nature tends to cause less efficient farming and lower farm incomes than is possible.

Another place where lack of knowledge retards adjustment or causes maladjustment in agriculture is in the whole area of alternative and comparative nonfarm opportunities that exist for some or all of the resources used in farming. A farmer who does not realize the employ-

ment opportunities, requirements, availability and rewards for himself or members of his family in nonfarm opportunities cannot consider these when making decisions. He will regard his activities as entirely or mostly farm oriented and will tend to regard all others as only remote or entirely impossible.

The same is true of the use of capital. Without knowledge of nonfarm investment opportunities they cannot be used even when they yield higher and more certain returns than additional capital invested in farming. Similarly, because of lack of knowledge, farmers will tend to operate or invest in land when returns from it are less than returns from other uses for the capital or for the land itself.

LACK OF TRAINING

People who have always farmed and had training designed specifically for farming have fewer alternatives for off-farm employment or a change in occupation. Many of the opportunities that farm youths and farmers could fill require training as skilled, specialized or professional personnel. Therefore, to the extent that training of farmers and their children is narrowly conceived and farm oriented, movement of the human resource out of agriculture will be retarded, and some who move may have to accept employment in less rewarding areas than would be possible with training.

Money invested in providing farmers and their children with advanced education or specialized training will pay big dividends to the individuals, to the agricultural industry and to the nation. The individuals themselves will have increased appreciation of their role as citizens and increased opportunities for employment even if they return to the farm. Those who move to off-farm employment to take advantage of an income opportunity which exceeds that they can expect on the farm thereby reduce the number among whom agricultural incomes must be shared—helping those who remain in farming. From their own standpoint they are able to have a better standard of living for themselves and their descendants than if they remained on the farm.

COST OF TRANSFER

Adjustment on the part of some farmers or their children is prevented by the cost of the move to a new location. This may be the case even when the distance involved is not great. Many could and would make the move if they could get relocated at a cost that they could or would assume.

INERTIA

There is little doubt that many times humans continue the present method of management, the kind and location

of employment because they are on "dead center." They resist any change because a change interrupts their busy lives and requires adjustment. Most people will adjust in some ways but attempt to continue a pattern of existence in others. Often this relates particularly to a change in location of residence or kind of employment or to the organization of parts of their business. It is not lack of knowledge or sociological or religious reasons but perhaps a basic craving for some degree of stability, regularity, security and organization in their pattern of living. Once off "dead center," or in other words, once a change has been made, the same adjustment and even associated changes may be made without further resistance as occasion demands.

In farming, inertia is responsible for some farmers receiving lower incomes and performing less efficiently than they would if they were receptive to changes that materialize to be profitable. Other farmers remain on the farm although incomes there are much lower than alternative opportunities for them elsewhere.

Encouragement in one form or other is often an effective device against inertia. If a trial of the new method, location or employment can be encouraged and arranged, the inertia involved may be dispelled.

OTHER CONSIDERATIONS

Humans live while earning a living and, although earnings are a necessary component of living, they are not by any means all there is to living. Human associations, religion, love, respect and many other psychic and, to date, nonmeasurable ingredients combine with income to provide whatever measure of happiness or utility a person receives from living. People who enjoy living must have many psychic values that contribute to their happiness.

Farmers, therefore, realize that many of the psychic values of which they are aware and which they enjoy would not be found in the same form or quantity, if at all, in a different location or employment. True, there will be others. But keeping what one has tried and found rewarding rates higher with most people than the knowledge or even assurance that a substitute of equal or greater value will be available after the change.

The psychic values of farmers—ranging from wide expanses of farmland and freedom of being one's own boss to the attributes of a farm for rearing children—constitute a potent force of attachment even for the younger generation. Most individuals with a farm background will, therefore, require some additional economic and/or other rewards in nonfarm employment to induce them to move. Of course, some individuals in agriculture also attach considerable value to opportunities that provide a regular income, hours and vacations—or that provide indoor employment or work with larger numbers of people. Such individuals will move more readily from farms and for a smaller additional income than the former group.

How Changes in Population, Family and Community Affect Agricultural Adjustment

BY RAY E. WAKELEY

FARM PEOPLE and farm families hold the key position in agricultural adjustment. Farm people are a most important resource factor in agricultural production. Farm family members do most of the work. The head of the family is usually the farm operator who plans the production and marketing of the products of the farm. Farm families are responsible for the natural increase in farm population. Both the farm and the family are deeply involved in agricultural adjustment which, in turn, affects farm family living and rural community services.

The proposition is accepted that there would be no serious problem of agricultural adjustment if changes in agricultural science and technology and in the demand for farm products could be foreseen and accepted and needed adjustments accomplished quickly and completely. In such a condition of agricultural bliss, farm family and community decisions could be made and adopted rationally on the basis of evidence presented by scientists as a result of research. But many decisions are made traditionally instead of rationally. Traditional decisions can be made more quickly and easily, and they are personally very satisfying. A general obstacle to agricultural adjustment is the fact that decisions often are made traditionally—in advance of rational consideration—and regardless of rational consequences. But traditional means can be used to make rational adjustments.

Agricultural adjustment is something to which farmers are alert and demanding; something in which society as a whole has major interest and concern; and something for which agricultural colleges have a special responsibility. The dictum is accepted that agriculture is in crisis and that agricultural adjustment is needed to remedy the crisis and find more permanent solutions. Among these crisis factors are war which inflates agriculture and makes postwar adjustment necessary; inelastic demand for many farm products which penalizes overproduction and results in a drastic curtailment of farm income with consequent loss of support for family living and community services.

Emphasis here is placed on farm and family adjustments instead of those which take place outside of the farm home and the boundary of the farm. But in the end, all adjustments in farming are made or implemented by farm families. Decision and action are functions of the farm family in a family farm system. Millions of small independent farm firms, each with its entrepreneur who

is also head of a still more independent farm family, make adjustments individually without regard to the agricultural industry or to society. Such independent action by farmers, by nature, is a major obstacle to the adjustment of the agricultural industry as a whole.

Chief concern in this analysis is with agricultural adjustment in Iowa where agriculture has been essentially commercial from Civil War days to the present. Farmers who stress noncommercial objectives are relatively few in Iowa. Their numbers hinder agricultural adjustment more than does their commercial agricultural production which is relatively small.

FAMILY ADJUSTMENT AND FARM ADJUSTMENT

Agricultural adjustment has both farm and family implications. Agriculture is a major industry with which is associated a distinctive way of living by independent farmers most of whom live on dispersed farmsteads in small rural communities. Historically the independently operated farm-and-home combination which we call the family-farm system, was legally fixed in the Midwest by the provisions of the Homestead Act which required that homesteaders live on their land.

The *farming* part of this combination was an agricultural industry in which the local units were relatively small, independently organized and operated farm firms.

The *living* part of this family-farm combination was a social system composed of independent, freedom-loving, farm-family social units. The operator of the farm was also head of the family, so farm and home were under one management. Adjustments in farming were made on a basis of family values and family needs, with little knowledge or regard for the adjustment needs of the agricultural industry. The ways of rural living which resulted from independent families living on dispersed farmsteads are evidenced today by weak neighborhoods and often inferior services which are available in small trade-center communities (5). Traditionalism and lack of adjustment to changes in the basic services of education, religion, business and local government still hinder agricultural adjustment in many ways. As transportation and communication improve and agricultural adjustments are made, neighborhoods are replaced by special-purpose groups, and local services generally become less adequate.

Farm families have heard many voices proposing many programs for agricultural adjustment on the basis of too

RAY E. WAKELEY is professor of sociology, Department of Economics and Sociology.

limited facts. Community adjustments have not kept up with the reduction in number of farms, and few rural communities have accepted any responsibility for promoting the adjustment of the agricultural industry. It appears that agricultural adjustment will lag until independent farmers can get needed information and organize for concerted action to adjust the agricultural industry to current needs.

FARM FAMILY LIVING AND AGRICULTURAL ADJUSTMENT

It was pointed out that farming in Iowa was commercial from the beginning and that farm family living was traditional from the beginning. Results of this relationship have made agricultural adjustment more difficult than it might have been if farm and family had been in step. One of the most powerful arguments against a farm proposal has been that it might weaken the farm family. Evidences of familism and agricultural fundamentalism still persist as obstacles to agricultural adjustment.

Evidences of lagging development in farm family and rural community social systems are many. Consider education. More than half of all Iowa schools are one-room schools. Farmers' wives are better educated than farmers, but neither are as well educated as town and city people. While the proportion of farm young people attending high school is increasing, it still lags behind in Iowa and elsewhere. Similar statements can be made about other rural community services.

Evidence of lag in adjustment is present even in our present farmers' organizations which, while they speak for farmers, speak with many voices in terms of crisis needs and remedies politically applied. They, too, lack a comprehensive plan by which farm entrepreneurs can bring about adequate adjustment of the agricultural industry by united action.

Consideration of the family power system may furnish an example to illustrate a lag in farm adjustment related to the traditional pattern of family dominance. In the family-farm system, power over land is seldom transferred freely and completely with the transfer of farm operation from father to son. Potential adjustment may be retarded by a father who trains the son in traditional ways and makes management decisions long after such control is justified by the business relationship.

Farming and farm life are changing rapidly, but enough characteristics of the old system remain to prevent adjustment from being rational and complete. From the standpoint of agricultural adjustment it will be helpful to change our farm family and community systems to a more specialized, impersonal, outgoing or outreaching point of view. This change is under way, but it will not be accomplished quickly. In the meantime we must understand how to work effectively with both traditionally and rationally oriented families and communities to achieve adequate adjustment in farming and improved rural living.

AGRICULTURAL ADJUSTMENTS UNDER WAY

Truthfully it can be said that the internal capacity to

adjust in agriculture lags behind that in more highly organized industries. But considerable adjustments in agriculture have been made and are being made. Several of these adjustments which are closely related to farm family and community development will be presented briefly. Adjustment brought about by changes in population has been and still is one of the most important.

POPULATION GROWTH AND AGRICULTURAL ADJUSTMENT

The growth of Iowa population is closely related to agricultural adjustment and to urban industrial development. Since 1900, more children have been born on Iowa farms than were needed to maintain farm population numbers. The number of farms in Iowa has decreased steadily from 222,000 in 1935 to 193,000 in 1954. This combination of circumstances has resulted in a steady migration of people from farms. Since 1920, the net migration from Iowa farms was nearly as large as the number on farms in 1955 (2). The total population of Iowa increased from 2,231,853 in 1900 to 2,621,073 in 1950. This was an increase of approximately 3.5 percent per decade. At this rate it would take nearly 3 centuries for Iowa to double her population. During the half century, 1900-50, the proportion which Iowa population was of the total population of the United States decreased from 2.9 percent to 1.7 percent (1).

Since 1950, Iowa has increased in population more slowly than any of the adjoining states. This was not caused by any failure of Iowa population to reproduce itself. More than twice as many children were born in Iowa in any recent year as there were persons of all ages who died. During the decade 1940-50, the births in Iowa exceeded deaths by 280,750. Of this total, 166,423 births were in the rural population and 114,327 were in the urban. If no persons had left the state, and none had moved in, Iowa's population in 1950 would have been 2,819,018 instead of the 2,621,073 enumerated by the census (6).

Thus the record shows that 197,945 more persons moved out of the state than moved into it between 1940 and 1950. But the movement of population was not evenly distributed over the state. While urban population in Iowa gained 25,508 persons by net movement to urban areas, rural population lost 223,453 persons as a net result of migration (6). Bowles estimated that the farm population lost 219,000 persons as a result of net migration from farms in the decade between 1940 and 1950 (2).

The net movement of population from Iowa farms is not new. Since 1920 it is estimated that the net movement of population from Iowa farms was approximately two-thirds of a million persons. Since 1920 the farm population has decreased from more than 40 percent to approximately 25 percent of the total population of Iowa. Iowa farm families have made a major contribution to agricultural adjustment by means of the migration of population from farms. The movement was not greater because of a number of factors, among which is the necessity for moving long distances because of the relatively limited opportunities for off-farm employment in Iowa, especially in the rural counties.

AGE OF MIGRANTS AND AGRICULTURAL ADJUSTMENT

Persons of all ages were represented in the migration from Iowa farms during the 1940-50 decade. More than half of the total (56 percent) were less than 25 years of age in 1940. The other 44 percent of the migrants from farms were evenly divided between the two age groups, 25-49 and 50 years or older (2).

The full significance of the relationship of age at migration and agricultural adjustment remains to be studied. It appears that 15-30 years is the age period during which most persons leave the farming population. These are the ages before persons become established in farming. Such migration takes farm young people out of competition for farms at an age when they can more easily become established elsewhere. Middle-aged migrants mostly are established farm operators or farm workers. When a farm operator leaves farming he makes a farm available for consolidation or for a new operator. The older group, those more than 55 years of age, are farmers who retired because of adequate savings or poor health and farm widows who left the farm after the death of the husband. Nearly all of these made a farm available for a new operator or for consolidation.

It is extremely important to note that $2\frac{1}{2}$ times as many persons under 30 years old left Iowa farms as left between 30 and 55 years of age or 55 years of age or older. The percentage of the various age groups which left the farm during the decade 1940-50 reveals additional important information. Slightly more than two-fifths of all persons between 15 and 24 years old left the farm. Less than one in eight persons 35-39 years old left the farm. Nearly half of those who were 65-70 years old left the farm, but there remained some 27,000 males on farms over 65 years old in 1950.

For the United States as a whole, the age of migrants from farms, 1940-50, differed in comparison with Iowa. More than half of those 15-24 years old migrated, and less than one-third of those persons left the farms who were 65-70 years old. Fewer young people and more old people left Iowa farms.

Great as they have been, the adjustments in farm population are not enough to solve the problem. Bowles and Taeuber indicated that during the 1940-50 decade in Iowa, 168 farm males entered the age group 25 to 69 for each 100 who left it by death or by reaching age 69 (3). That meant that 68 male farm youths reaching age 25 had to leave the farming occupations for every 100 who could remain *if there were no decrease* in the total farm population of working ages. When decreases in the number of farms and in the number of farm hands and laborers are taken into account, it seems clear that approximately half the farm boys who turned 25 years of age were not needed to maintain an adequate farm labor force. This is all the more remarkable because we know that, of all those males who left Iowa farms between 1940 and 1950, 56 percent were under 25, and nearly 10 percent were 65 years of age or older.

Fewer farm males will need to migrate from Iowa farms during the 1950-60 decade; fewer of them will arrive at age 25 during this decade because of the relatively small baby crop 25 years ago. During the 1950-

60 decade 136 farm males will reach age 25 for every 100 in the 25-69 year age group who will reach age 69 or die during the decade (3). Counting again for a decrease in farm labor and in the number of farms, approximately 40 percent of farm boys reaching age 25 during the decade will not be needed on Iowa farms. During the 1970-80 decade, this problem of young people entering the labor force promises to become more pressing than it is at the present time because of the greatly increased number of births during the 1945-55 decade.

The excess of young farm males is not evenly distributed over the state. In northwest Iowa, two-thirds of the farm boys reaching age 25 are not needed on farms. In southern Iowa several counties are in a situation where they can retain for the present all but 20 percent of their farm boys who reach age 25. This difference between northwestern and southern Iowa results mostly from the fact that in southern Iowa more farm boys migrate at a younger age and farm operators are older in southern Iowa than they are in the northwestern part of the state.

Relationships between population growth and agricultural adjustment are not exhausted by consideration of the need for migration and the facts concerning rural-urban migration.

(a) Birth rates which were higher for agriculture than for most other occupational categories have been generally accepted as normal for all agricultural occupations except owner-operators.

(b) During the past 15 years urban birth rates have increased more rapidly than rural rates, and in some areas urban birth rates have exceeded rural rates (6). As a result, excess farm populations are not presently needed to maintain or swell the size of cities. Therefore, excess farm population may be considered a true surplus in the sense that, according to present standards of growth, it is not badly needed anywhere. This situation is still more likely to be true 10 to 20 years from now when our much larger postwar population increases will enter the labor force at an increased rate, amounting to approximately $2\frac{1}{2}$ million persons per year. Population is the only producer's surplus which is produced and delivered free to the hirers of resources who need only pay a current wage, none of which goes directly to the family which produced the laborer. Farm families produce most of this surplus.

Farm families produce a population large enough to maintain the farm population and contribute to a rapidly expanding industrial development. Agriculture needs a declining number of workers. Here lies a major adjustment problem: So long as employment in other occupations expands rapidly enough to absorb those not needed in agriculture, the simplest answer is composed of three parts—(a) assist those young people who are not needed on farms to locate elsewhere, (b) assist less successful farmers to obtain off-farm work and (c) assist older operators to retire or reduce their farming operations at an earlier age.

OCCUPATIONAL CHANGES AND AGRICULTURAL ADJUSTMENT

Many farmers make a shift in occupation and at the same time continue to live on the farm. Combinations of

farming with other occupations are increasing. Some farmers do road maintenance work, local trucking, custom machine work, sell seed corn, etc. Others have a seasonal or occasional job in nearby town or city. Still others hold a full-time job and continue farming with family help by working on the farm evenings and weekends.

More farmers are working more time off the farm. In Iowa nearly one-third of the farm operators did some work off the farm in 1954. The proportion of farm operators who worked 100 or more days off the farm has increased, in fact it has nearly doubled since 1945. In some counties in Iowa—large city counties and southern rural counties—between 15 and 30 percent of the farm operators work off the farm 100 days or more. The proportion for the United States (27.9) is $2\frac{1}{2}$ times as large as the proportion in Iowa.

Adjustments in agriculture are made increasingly by change in occupation without change in residence. In this way overconcentration of population is avoided, and part-time farmers are in a better position to shift from emphasis on agricultural to emphasis on nonfarm work or to shift back to agriculture if conditions change. Rural living for industrial workers also may relieve the necessity for adjusting community services to a declining population in some rural areas. Adjustment in occupation without change of residence promises much for the adjustment of agriculture, but the great possibilities in such rural adjustments have not been fully explored. Increased opportunity for off-farm employment decreases the necessity for migration from farms and aids agricultural adjustment.

SOCIAL SECURITY AND AGRICULTURAL ADJUSTMENT

Farmers are applying for social security payments in greater number than was anticipated when farmers were made eligible to qualify under the Old Age and Survivors Insurance retirement program. Some farmers believe they should provide their own retirement income, but many have been unable to do so. Some farmers believe that social security is wrong. Many farmers do not understand social security well enough to enable them to qualify to receive it. Undoubtedly social security for farmers will make retirement possible for more of them and at an earlier age. Retirement may be made easier for farm renters and for landlords who can qualify under the provisions of the 1956 amendments to the Social Security Act. The full impact of social security is not known, but agricultural adjustment will be improved by any program which increases security in farm retirement and makes the choice more rational, whether to go or stay.

COMMUNITY CHANGES AND AGRICULTURAL ADJUSTMENT

Farm families and townspeople have not reorganized and retooled their communities as they might have done during recent prosperous times. Farmers retooled their farms before World War II, and they retooled again after the war. Farms have been and are still being enlarged, but schools, churches, local business and local government remain much the same as before. Rural people

evidently preferred traditional community services instead of more expensive services of better quality which were more impersonal or farther removed from their farm homes.

Of course, some problems of improved community services are not entirely under the control of farmers. Some farmers were willing to accept the limitations of the local situation and go elsewhere if they wanted better business and professional services. This appears to be true especially in small town rural situations. These have been hit hardest by migration from farms, and other local opportunities for employment have not developed to hold the population.

The problem of the small town in a farming area becomes especially difficult during a time of rapid agricultural adjustment. Small incorporated towns in Iowa have increased in number and in total population from 1900 to 1950. However, with the exception of county seat towns, few places with less than 5,000 population in 1950 have made marked increases in population since 1900. Most county seat towns have increased regularly but slowly. The general lack of growth of rural towns has been a major reason for the common lack of community development. General reasons for lack of growth are three: (a) reduction in number of farms and in farm population served by rural towns, (b) improved transportation and communication which brings rural towns in sharper competition with each other and with cities and (c) a lack of industrial development or other employment sufficient to maintain a growing population. It appears that these factors will continue to affect rural towns unfavorably. This is a powerful argument for reorganization, specialization, consolidation. But it does not make the job any easier for rural towns—it only increases the necessity for such action.

Some promise for the future development of rural towns results from recent increases in the number of people living in the open country who are not farming. This is the fastest growing part of the Iowa population (7). This increase is taking place in nearly all counties, but it is greatest in the urban counties and in central and eastern Iowa. Continuation of these changes will be one of the most important future developments in Iowa population. Its effects on agricultural adjustment will be indirect and will be expressed largely in terms of its effect on community development.

INDUSTRIAL DEVELOPMENT AND AGRICULTURAL ADJUSTMENT

Industrial development is offered by many as the most important remedy for agricultural maladjustment. The general assumption appears to be that agriculture lags behind industry, and that agricultural adjustment depends upon industrial development because industrial employment is the principal source of jobs for the surplus labor force released from agriculture. This means the further expansion of cities through migration from farms. But cities are now expanding through the growth of their own population. Nonagricultural employments will need to be expanded more rapidly in the future if they are to absorb the urban population increase plus the population surpluses from Iowa farms which during recent decades

have equalled a new city the size of Des Moines for each decade. Iowa industry has expanded in no such fashion as this. In fact, it has only maintained the rate of expansion attained by United States industry as a whole.

LEVEL OF LIVING AS EVIDENCE OF ADJUSTMENT

Changes in level of living give some evidence of successful adjustment in agriculture. Farmers are interested in living better. Over the years since 1930 the changes in farm level of living have been relatively slow, but they have been uniformly up (4). The Hagood indexes of level of living for farm operator families in the United States increased from 75 in 1930, to 122 in 1950. In the same time the index for the West North Central states increased from 107 to 147. The index for Iowa increased from 132 in 1930, to 178 in 1950. The Hagood level of living index also showed increases for the 1950-54 period; from 122 to 134 for the United States, from 147 to 159 for the West North Central states, and from 178 to 185 for Iowa. The index increased less for Iowa.

One other evidence of adjustment in rural communities is especially interesting because it illustrates the organization of primary personal relationships for secondary impersonal services which is taking place in Iowa. This is the spread of community chest or fund-raising drives organized in rural areas. Of a total of approximately 150 federated fund-raising campaigns in Iowa in 1956, 10 were in rural town-country communities, and 45 were organized in rural townships in nine Iowa counties (8).

Twenty-five years ago the experts were saying community chest drives could not be successfully organized in towns of less than 10,000 population. Now Iowa farmers are organizing federated fund drives in townships with less than 1,000 population. This is a good example of rational farmer adjustment to urban ways.

The pressure in rural counties for farmers to participate in the programs of outside organizations is tremendous and increasing. Ordinarily 30 or more specialized organizations and agencies from outside a county serve

a county and bid actively for rural support (5). This is one of the most potent influences for rural change. But few of these organizations recognize farmers except in terms of their own organization program, and almost none is directly related to the adjustment of the agricultural industry. This countervailing tendency in rural organization is strong. It remains to be seen whether farmers will organize in their own interest or come to depend more and more for organized services on organizations and programs which come into rural areas from centers of power outside rural communities.

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Educational Needs and Rural Adjustment in Iowa

BY GLENN E. HOLMES AND CHARLES E. DONHOWE

A RURAL IOWA in transition presents many kinds of adjustment problems. Educational programs must keep pace with the times and assist youth and adults in making the necessary adjustments. Employment in major occupational groups is gradually changing in America, and this is reflected in Iowa. It is anticipated that a higher percentage of workers will be required in professional and technical, proprietary and manager, clerical and sales, craftsmen and operatives, service and skilled labor areas—but that unskilled jobs, farmers and farm workers will decline in the next 10 years.¹

The type of education needed in rural Iowa to aid children and adults is implied in the report of The First White House Conference on Rural Education in 1944. In this conference a charter of Education for Rural Children was established. The 10 points mentioned were:

1. Every rural child has the right to a satisfactory, modern elementary education.
2. Every rural child has the right to a satisfactory, modern secondary education.
3. Every rural child has the right to an educational program that bridges the gap between home and school, and between school and adult life.
4. Every rural child has the right through his school to health services, educational and vocational guidance, library facilities, recreational activities, and, where needed, school lunches and pupil transportation facilities at public expense.
5. Every rural child has the right to teachers, supervisors and administrators who know rural life and who are educated to deal effectively with the problems peculiar to rural schools.
6. Every rural child has the right to educational services and guidance during the entire year and full-time attendance in a school that is open for not less than 9 months in each year for at least 12 years.
7. Every rural child has the right to attend school in a satisfactory, modern building.
8. Every rural child has the right through the school to participate in community life and culture.
9. Every rural child has the right to a local school system sufficiently strong to provide all the services required for a modern education.
10. Every rural child has the right to have the tax resources of his community, state and nation used to guarantee him an American standard of educational opportunity.

A concluding statement under the charter suggests: "These are the Rights of the Rural Child because they are the Rights of Every Child regardless of Race, or

¹ U. S. Dept. Labor. Population trends—their manpower implications. "Our manpower future—1955-65." U. S. Govt. Print. Off., Washington, D.C.

GLENN E. HOLMES is associate professor of vocational education, Department of Vocational Education. CHARLES E. DONHOWE is assistant professor and district supervisor, Cooperative Extension Service in Agriculture and Home Economics.

color, or situation, wherever he may live under the Flag of the United States of America."

It has been more than a decade since the charter was drawn up. The questions pertinent to our consideration are (1) where are we today in the nation and in Iowa regarding rural education and (2) in what direction are we moving?

The rural farm population is steadily decreasing and will no doubt continue to do so in Iowa. In one county now under study, it was discovered that there were nearly 1,000 more rural school pupils in 1890 than there were in 1955.²

During the decade since 1944, the national farm population has decreased from approximately 30 million to less than 23 million. The percentage of decrease in rural school enrollments has not been as great as for the total population because of the increase in birth rate. Another factor which influences the above is that, for the nation as a whole, there has been a gradual increase in the percentage of rural pupils attending high school. While the urban percentage of high school attendance has always exceeded the rural, the percentage decrease in high school attendance during the war was greater in the cities than in the rural areas. In the past decade "the proportion of youth 16 and 17 years old in high school increased nearly 20 percent while the proportion of urban youth remained about the same."³

SCHOOL REORGANIZATION

During the 10-year period 1944-54, a "reduction in the number of school districts nationally from 110,000 to 66,000 took place by direct action of the people. The greatest reduction occurred in six states—Illinois, New York, Texas, Missouri, Mississippi and Arkansas. In contrast, seven states—Nebraska, Wisconsin, Minnesota, Michigan, Iowa, Kansas and South Dakota—now account for approximately half of the total number of school districts in the United States."⁴

It is significant that Iowa is one of the seven states with nearly half of the total number of school districts in the nation—though these states by no means include half of our population. Likewise, it is significant that

² In this context a rural school refers to the school where rural pupils attend, not necessarily the one-room rural school which is fast disappearing from the education scene.

³ National Education Association, Department of Rural Education. Rural education—a forward look. 1955 yearbook.

⁴ *Ibid.*

quite rapid strides are being made in school district reorganization in Iowa at the present time. Less than 3 years ago only about 25 percent of the land area in Iowa was in a high school district. By July 1, 1956, the percentage had moved up to 48.9. The 51.1 percent, the non-high school land area, enrolls only 10 percent of the total school population. The most recent data from the State Department of Public Instruction show that during the second quarter of the present school year, 1956-57, seven reorganizations took place, which reduced the total number of school districts by 28. Of these seven mergers, three include over 100 square miles each, four include over 600 pupils each, two involve more than one present high school and four are above 5 million dollars in assessed value. In February 1957, a new reorganization record was reached when, in Audubon County, the area of 208 sections was joined around the city of Audubon. This is the largest reorganized district in Iowa and, with a previous vote at Exira, reduces almost the entire county to two school districts.

School reorganization affects the tax base because it results in expansion into larger taxable land areas. In some cases land owners have an increase in taxes through reorganization; in other situations, the tax may decrease. Reorganization does have a tendency to equalize the school millage levy on land. Some argue that there is too great a differential in tax obligation between rural and urban areas when these two merge.

In Iowa, Agricultural Land Tax Credit is expected to reduce the rural tax share for schools above 15 mills. With a decreasing population in rural areas and a reduction in the number of farmsteads, the assessed value of the land is often reduced; thus, resulting in less available money locally for school support. Throughout the past years there has been a gradual increase in state aid to schools—tending to reduce the tax obligation on land. The actual amount paid by land, however, has not been reduced to any great degree because of increasing school costs. As industry increases in Iowa more employment opportunities are offered, and the taxable valuation of land in those areas rises.

Where reorganization permits larger high schools, broader curricula can result. High schools having well-qualified teachers and offering training in trades and industry, business and commercial, homemaking and agriculture, science and mathematics—as well as the basic English and social studies—better prepare students for life than do those schools with limited offerings and poorly qualified teachers. A larger high school also assures a more diversified activity program. Most students gain valuable first-hand experience in working with people through a varied activities program. Effective guidance will assist the many farm boys and girls who must seek employment away from the farm. It can be expected that their high school training will help them find their place in a highly complex occupational world.

THE RURAL ENVIRONMENT AND THE CHILD

Meeting the challenges of rural education in Iowa, as in any state in our nation, requires that we know which way we should turn to fully realize the most satisfactory

objectives for an area in transition. Is there a need for a different type of education for rural than for urban youngsters? Inasmuch as the differences between rural and urban citizens are fast disappearing and also because the 1944 White House Charter on Rural Education affirmed that those 10 educational rights were good for any student, we might conclude that the type of education for both rural and urban youngsters should be quite the same. If one were to attempt to weigh urban and rural education in the balance, urban education would hold a more favorable position—because of breadth of curriculum in high school, teachers with longer tenure and better training, and a higher percentage of pupils entering colleges.

Dr. Francis Chase in an address of a few years ago referred to adequacy of education as follows: "Adequacy has several dimensions: Adequacy in the sense of enabling the individual to develop his full power so that, in his own way, he may make his special contribution to our society; in the sense of developing the nation's full potential of its human resources; in the sense of developing citizens who can make wise choices. The task of providing an education adequate to sustain our freedoms is the over-all task which confronts all of us. It is of special concern in rural areas because the loss of potential human resources is greatest in the rural areas, greatest of all among our disadvantaged groups."

The educational experiences of boys and girls are acquired through many media. In addition to schools, agencies such as 4-H, boy and girl scouts, churches and other organizations add much to their store of knowledge. It is in these groups that they learn many fundamental facts about the democratic process—how to get along with people, why it is important to assume responsibility, how to become responsible, and what are the essential leadership qualities democracy expects.

"Rural youth need a quality of teaching, a flexibility of grouping for experiences, which make possible sequence and continuity for the individual learner in the learning experience provided."⁵

Iowa with its many small high schools is caught in a maelstrom of adjustments of its educational system to cope with the times. Some progress is being made as noted. Iowa rural people may satisfactorily work out their destiny in education, but they need guidance and encouragement. It is often difficult to see the forest for the trees, and scores of rural people must raise their vision above their own small neighborhood, their basketball team and personal interests. Recent developments lead one to believe that our Iowa rural people are catching the vision. Possibly the next 5 years will witness remarkable strides in district reorganization. In a recent study by Ernest,⁶ 440 husbands and wives of farm families in 10 counties of Iowa placed good education of their children high on their list of things which seemed most important to them. This ranked second in a list of open-ended resources and first among 15 goals suggested by the examiner.

At the present time about half of the farm children leave the farm. The reasons are many: lower income, limited opportunities for cultural growth, poorer educa-

⁵ Ibid.

⁶ Ernest, Eva Rut. Factors related to family goals specified by farm operators and homemakers. Unpublished M. S. thesis. Iowa State College Library, Ames, Iowa. 1956.

tional opportunities, lack of occupational opportunity and "general occupational prestige."⁷ As Iowa population changes from predominantly rural to an equal number of urban inhabitants, farm operations move toward large scale. Agriculture in Iowa has become highly technical and commercialized. Public schools and the Cooperative Extension Service have an obligation in providing educational opportunities in this transition.

As the rural nonfarm population increases, the rural school curriculum must be broadened to include varied vocational training such as opportunities in commerce, the trades and service areas. Because these people live among agricultural producers, they should also be given help in understanding Iowa agriculture. Around the fringe areas of large cities where rural nonfarm population is growing rapidly, serious attention should be given to an adult education program which will afford these citizens opportunity to fully realize their privileges, challenges and responsibilities. They represent a group of people with divided loyalties. They work in cities but live in the country. They must have learning experiences identified with their problems. This responsibility rests upon public schools, extension education, local community colleges, libraries, churches and other organizations.

Even though there is a general exodus from farms, there are many low-income farmers who will cling to their farm operations for many years. These people are urgently in need of assistance, both in helping them to improve their farm program and/or in making alternative plans for work off the farm either through their decision to leave the farm completely or to seek part-time employment elsewhere.

The number of farmers who seek part-time employment off the farm is increasing. There is also an increase in the number of farm women who are working on and off the farm. Work away from the farm requires that the individual develop a high efficiency in completing the farm and/or household duties with dispatch. The part-time farmer and homemaker must know and use labor-saving devices. Those agencies which wish to reach him, however, should be cognizant of the fact that his off-farm working schedule may vary with that of his neighbors. Adult education programs must be tailored to fit both his needs and his peculiar time schedule.

Much attention must be given to the rural young people who graduate from high school but do not enter farming. High schools, working closely with the Cooperative Extension Service, should consider ways in which both can capitalize on the students' rural background, interests and aptitudes. We owe it to Iowa agriculture to see that no boy or girl completely severs himself or herself from agriculture simply because he or she sees no choice in the matter. Many of these young people will go into industry in Iowa. According to Clark C. Bloom, of the State University of Iowa, manufacturing employees have moved upward from 88,054 in 1939 to 161,707 in 1954.⁸ Plenty of job opportunities are available for the professionally trained in agriculture. This points up the importance of the need for a strong program

of vocational guidance in the high school and one which may be coordinate with the guidance efforts that might be developed through 4-H programs. These two training groups should work together. Their programs must complement each other if they are to achieve maximum results. They both deal with the same youngsters whose problems revolve around (1) what kind of a person am I, (2) what does the world of work look like, (3) how can I fit into the job pattern and (4) how can I make the best use of my rural background?

Increased rural-urban contacts tend to destroy dissimilar ways of living. The country "hayseed," if ever in existence, has long since disappeared. Homemaking and family living problems in both city and rural Iowa call for similar treatment. Rural high school and adult homemaking courses must be broadened to encompass a wider reach beyond rural experiences.

The Cooperative Extension Service has a similar responsibility for both youth and adults. The 4-H club work should be tailored to both groups. With the expansion in mobility and heightened complexity in living, comes the challenge regarding the role of the family. What of the small neighborhood group and family primary relations, as adjustments such as school district reorganization take place? Progress cannot be blocked by insistence that antiquated types of school organization be maintained.

Changes within school district boundaries are made by popular decision. Granting that considerable planning may have gone into the program ahead of the vote, yet, in the span of a few hours—the time the polls are open—the complete organizational structure of the district may be changed. After the decision is made, it is expected that the district will remain for many years as voted upon. This is one of the most important reasons why school district reorganizations move slowly. One decision changes the complete organization, and it is expected that the change be relatively permanent. Throughout Iowa, people voice these words, "I believe school district reorganization is coming, but we are not ready for it in this community." Through adult education these people must be encouraged to study their situation and make desirable decisions.

Rural families are concerned about what is going to happen to the family in its relationship to the small neighborhood. Will the loss of the small high school, as will occur in many localities, spell doom to the community and community spirit? Are there important human values which may be salvaged or substituted for the local pride engendered throughout the years and established around the local high school? Does the passing of the high school mean the small town is doomed to destruction and decay and with it the services provided for the families in that area? These, and many more, are questions near to the hearts of those who reside in the rural areas.

Those who develop plans for school district reorganization should face these questions squarely. School district reorganization does not necessarily mean the closing of schools by absorption. Instead, it means the expansion of the school district boundaries. Most authorities on reorganization insist that local attendance centers for elementary pupils be maintained close to the children's homes. But for the most efficient operation, the high school must encompass a larger attendance area. Local

⁷ Lawrence, Thomas. *The occupational structure and education*. Prentice-Hall, Inc., N. Y., 1956. pp. 181 and 186.

⁸ Bloom, Clark C. *Iowa's potential as an industrial state*. Paper presented at the 1956 Annual Extension Conference, Iowa State College. Mimeo. rept. TR-71. Jan. 1957.

pride and enthusiasm can be fostered through parent-teacher-student relationships around the elementary attendance centers as well as the same type of relationship in the larger high school area. This is no different than the conditions which exist in city systems. Adult education programs could center in the elementary as well as the high school units.

Joint efforts from the public school and cooperative extension can assist the people in understanding these facts. There are cases in Iowa where the small attendance area for the new elementary unit within the reorganization is larger geographically than was the case of its entire drawing area under its former plan where the 12-grade unit existed.

Education is life. Far too many youngsters leave school because it has ceased to have meaning for them. Scouts, 4-H and other youth organizations can appeal to rural youth because they are voluntary in nature and capture the youngster's enthusiasm and loyalty in an atmosphere of greater freedom. The voluntary leaders could do much in encouraging youth to stay in school and receive as much formal training as possible. School teachers should capitalize upon encouraging young folks to affiliate themselves with these voluntary groups and should give opportunity for the pupils to relate experiences in voluntary associations to the learning acquired in schools. If education is life, it must be allied with life experiences at every opportunity. The schools and 4-H have a responsibility in helping the home and church in the teaching of moral and spiritual values.

As our population becomes better educated, additional demands are placed on the school and the voluntary agencies dedicated to working with youth. The keystone of public relations in our schools is fast becoming one of lay participation. This affords a golden opportunity for school officials to exert a new type of leadership, a leadership which taps the resources of the community through instruction and encouragement of lay citizens to assume their responsibilities in leading. In rural Iowa the best foundation for the development of the type of leadership demanded today is through the school and 4-H experiences.

Guidance in meeting life's problems and in making vocational choices should start early with youngsters. Based on the evidence from questions asked in freshmen orientation days at Iowa State College, it is questionable whether this is happening in many instances. Guidance presupposes that those who are attempting to give advice know two things especially: (1) who is the subject seeking advice—what is he like, what are his abilities, what are his weaknesses, what are his interests and aptitudes, how determined is he to work toward particular goals and what are the financial resources behind his aspirations; and (2) how does the world of work appear in the light of how the individual's interests, desires and capabilities can be channeled?

County extension staff members work closely with young people and their parents, often in their home settings. It is quite simple to relate 4-H experiences to real life situations. The simple primary face-to-face relations promote confidence in the minds of those with whom the county staff members counsel. Unfortunately, the 4-H programs do not reach all young people in each county. Valuable personal cumulative records, kept by most schools, are not generally available for county extension staff members. In the past, county extension staff members have not necessarily considered guidance opportunities as an important part of their educational program. Many voluntary leaders are not trained to be satisfactory guidance counselors.

Extension workers and school people should join hands in counseling programs for rural youth. Each has resources upon which the other could well capitalize. The success of a guidance and counseling program which might be adopted by county extension workers is dependent upon (1) one's skill as a counselor, (2) one's ability to tap local resources to assist, especially by getting local 4-H leader assistance, (3) one's ability to work with local school people and county superintendents and (4) one's sincerity in following through. Rural leadership must be maintained in Iowa. It is important to our state and nation that help be given rural Iowa in this period of adjustment.

School people and county extension staff members, working together, can make an important contribution to the solution of this problem. Guidance programs in rural schools in Iowa are inadequate. This consensus was validated in part by agreement in a meeting of 15 county superintendents in central Iowa. Good guidance counselors are difficult to procure. It is true that the public and/or parochial schools reach all the children except the dropouts. The school buildings, equipment and teaching staff promote a suitable atmosphere for learning. Even though meager in many schools, more and more attention among educators is now being given to the establishment of good guidance programs. It must be recognized that teachers frequently fail to become personally acquainted with their students, and the students are often hesitant to express their feelings in the captive-audience school atmosphere.

The county superintendent's responsibilities cover the complete county. Under the County Administration Law, the intermediate unit in Iowa meets in full the requirement for such a unit as established in the literature. These include (1) a board to determine policy, (2) a clear definition of function in law, (3) authority to levy taxes and (4) high educational standards for the administrator. Many county superintendents are working closely with county extension staffs on various projects. It cannot be expected that a county superintendent will have detailed information about all students in the county and that he know them personally, however.

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