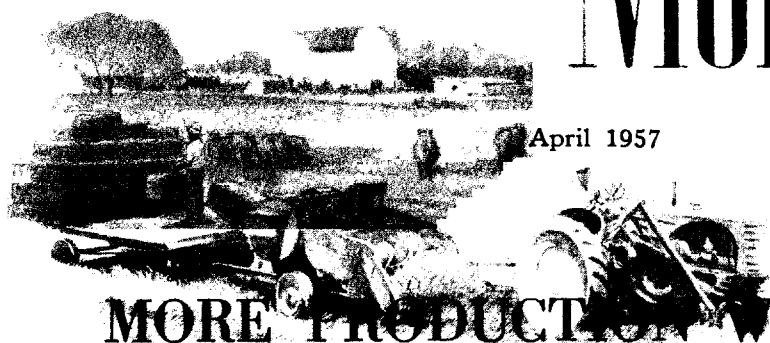


Monthly Review

April 1957

Volume XXXIX

Number 4



MORE PRODUCTION WITH FEWER FARMERS—

A Quarter Century of Changes in District Agriculture

THE GROWTH OF FARM PRODUCTIVITY has been aided by increased knowledge and the application of capital. However, rapid progress in agriculture has its associated problems. The human effort needed to produce farm products is being reduced and fewer farm units are required, but total land in farms has not changed greatly.

This internal transformation of agriculture in the district has involved more land per worker, more livestock per worker, more farm machinery and the application of many additional improvements in production techniques.

The resource changes have resulted in more efficient performance on district farms measured in value of products sold per worker at constant prices. Consumers, particularly, have benefited.

Federal Reserve Bank
of St. Louis

Survey of Current Conditions—p. 58

MORE PRODUCTION WITH FEWER FARMERS—

A Quarter Century of Changes in District Agriculture

The growth of farm productivity . . .

THE INCREASE IN OUTPUT PER MAN-HOUR of labor during the past quarter century has been spectacular. From 1910 to 1930 farm labor productivity lagged behind increasing output per man-hour in manufacturing. Since 1930 though, American agriculture has made a magnificent breakthrough in productive efficiency (Chart I). By 1954, the date of the last Census of Agriculture, the average American farm worker was producing two-and-one-third times as much per man-hour as he was in 1929.¹

A clearer picture of this significant growth in farm efficiency appears if we visualize all the nation's farms as one huge farm plant. In 1954 the plant produced 47 per cent more food and fiber with 26

¹ Farm workers include all operators, wage hands, or unpaid family members doing farm work or chores. This definition varies slightly from one Census to another.

per cent fewer workers than in 1930 (Chart II). During this period the proportion of the nation's labor force operating the farm plant declined from about one-fifth of the total to one-ninth. Furthermore, occupation statistics understate the increase in farm efficiency, since farm operators have done more and more off-farm work over the past two decades.

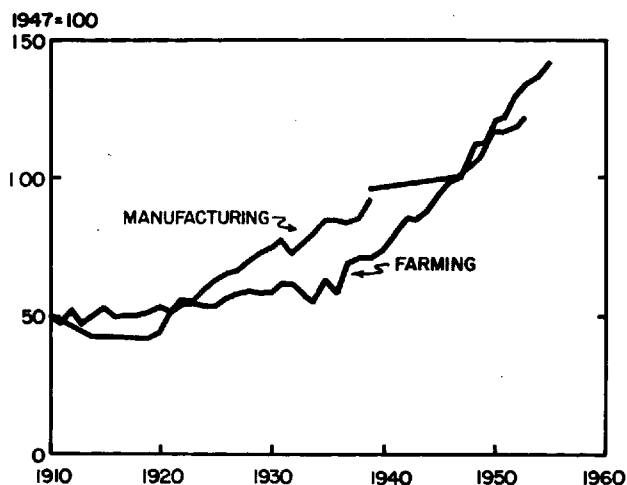
. . . has been aided by increased knowledge . . .

Explanations for these rapid changes in farm labor productivity usually center around improved techniques applied to farm production problems, and the nation's farm research and educational facilities are given much of the credit for the change.

Until the turn of the century there was little demand by farmers for scientific research or "book learning" as applied to agriculture. Methods used by father were generally thought to be good for son.

Chart I

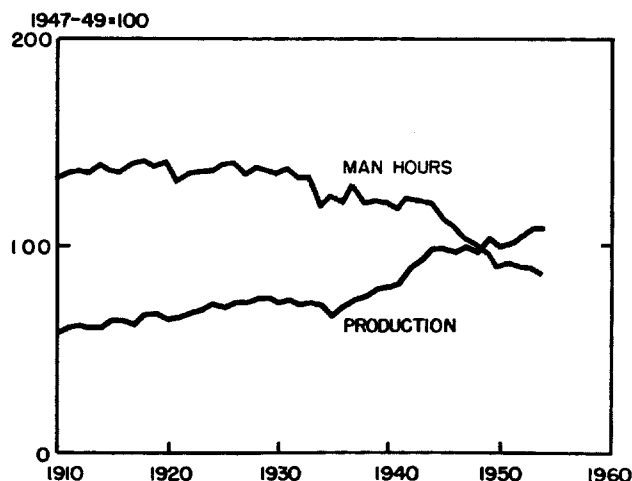
Output per Man-hour, Manufacturing and Farming, United States, 1910-1954



Department of Agriculture and Bureau of Labor Statistics.

Chart II

Farm Output and Man-hours of Labor for Farm Work United States, 1910-1954



USDA, *Changes in Farm Production and Efficiency and New Index Numbers of Farm Marketings and Consumption.*

But there had been substantial gains in the mechanization of agriculture. By 1900 most of the major farm implements had been invented, though many were not in common use except on large specialized farms primarily in the Midwest, and widespread applications of power in agriculture were yet to come.

The beginning of organized research on a national scale dates back to the Morrill Act of 1862. This Act provided for a grant of 30,000 acres of land to each state for each representative and senator in Congress for the support and establishment of an agricultural and mechanical college. Another step in developing a nationwide program of agricultural education and research was taken with the passage of the Hatch Act in 1887. It provided an annual grant of \$15,000 to each state for research in agriculture and gave the initial Federal financial support for the state agricultural experiment stations. Federal support for agricultural research was increased in 1906 with the passage of the Adams Act, and substantial additional grants for this purpose have been made during each decade since 1920.

A national extension program for farmers took shape with the passage of the Smith-Lever Agricultural Extension Act in 1914. Out of this Act has grown the Agricultural Extension Service, the vast educational organization that carries latest research findings to farm people. In addition, the Smith-Hughes Act of 1917 provided Federal Aid for schools offering agricultural courses. Under this program vocational agricultural courses have been established throughout the country at the high school level.

Much farm research and extension has been done by nongovernmental agencies. During the early 1900's an increasing number of well edited magazines carried news of changing farm technology to farm operators. Many farmers conducting their own research have made valuable contributions to the store of farming knowledge and, more recently, several large commercial corporations have gone heavily into research programs. Feed, fertilizer and farm machinery manufacturers and commercial seed producers have moved effectively into the agricultural research field. The combined efforts of these groups and government sponsored research agencies have laid the foundation for the tremendous improvements that contribute to increasing agricultural efficiency such as those in farm mechanization and land use, fertilization and cultural practices, feeding and development of new breeds of livestock and new varieties of crops.

... and the application of capital.

Without the wherewithal to apply this fertile stream of new techniques to farm operations, progress would have remained limited. American farmers have financed a large per cent of their increased capital needs from savings. High postwar farm prices contributed substantially to this self-financing effort. In addition, many young farm operators supplemented farm capital with savings from service in the Armed Forces or from on-the-job training programs after the war.

Farm credit institutions have also played a major part in the forward march of farm technology, furnishing funds to supplement farmers' savings. Farm mortgage credit totaled \$9.6 billion in 1930, declined to a low of \$4.8 billion in 1946 and rose to \$9.0 billion in 1956. Non-real estate credit extended to farmers by principal lending institutions, excluding Commodity Credit Corporation guaranteed loans, declined from \$2.5 billion in 1930 to a low of \$1.1 billion in 1937. The volume of such credit had reached a record of \$5.0 billion by July 1955.

Practices and procedures of lending institutions have changed to meet the needs of a developing agriculture. Longer term loans, lower interest rates, budgeted disbursements, closer managerial supervision and better credit records are examples of such developments. Progressive lending institutions are making use of newer procedures and have done an effective job in meeting the farm credit needs of their communities.

However, rapid progress in agriculture has its associated problems.

Although this great upsurge in food and fiber production per man-hour in recent years has contributed importantly to the development of the American economy, it has created maladjustments. Unlike many industries that can greatly expand sales with rising productivity, increases in farm sales come slowly. The human stomach is limited in size and relatively stable in its requirements. Hence, the total quantity of food consumed by the American people in a given year varies little with changes in price. Disregarding export and nonfood uses of farm output, the adjustment necessary in the industry depends essentially on two rates of change: population growth and output expansion. For four decades prior to 1920 the rate of growth of the nation's population was generally even with or ahead of farm output expansion.² However, since 1930 the rate of farm

² Wilcox and Cochrane, *Economics of American Agriculture*, p. 493.

output has gone well ahead of the rate of increase in population. Furthermore, the export market has failed to take up the excess at prevailing (domestically supported) prices. Thus, America's success in achieving an agricultural cornucopia despite the niggardliness of nature has created the persistent farm surplus problem.

The excess of farm production during World War II was used profitably to feed our Armed Forces; our allies and starving people throughout the world benefited immediately following the war. With world production restored, surpluses began to accumulate again in the late 1940's and have remained a problem since that time except for a short period during the Korean War.

If maximum efficiency is desired, one apparent solution to the problem is the transfer of some resources out of agriculture and the concomitant recombination of resources within the industry. This article focuses attention upon such shifts in the resource structure of agriculture in the Eighth District and the consequent increase in farming efficiency. Most of the data are taken from the Censuses of Agriculture for 1930, 1940, 1950 and 1954 with data from other sources used as indicated to supplement Census figures. County or Economic Area data were used to obtain totals for the district. For convenience, state names, unless otherwise indicated, refer only to the district portions of the states falling within the district.³

The human effort needed to produce farm products is being reduced. . .

Farm labor requirements, representing about two-fifths of the dollar value of the nation's farm inputs at 1950 prices, have declined substantially in both district and nation since 1930 (Table I). In this period the nation's farm workers declined in number

TABLE I
THE NUMBER OF FARM WORKERS HAS DECLINED SHARPLY
IN ALL DISTRICT STATES.

EIGHTH DISTRICT PORTION OF STATE	NUMBER OF WORKERS IN THOUSANDS					PER CENT DECREASE 1930-1956
	1936	1954	1950	1940	1930	
Arkansas	208	226	264	340	384	46
Illinois	99	106	113	121	129	23
Indiana	52	55	59	61	65	20
Kentucky	138	149	168	178	201	31
Mississippi	175	189	212	271	357	51
Missouri	232	251	279	294	304	24
Tennessee	78	85	95	103	135	42
Eighth District	982	1,061	1,190	1,368	1,575	38
United States	7,189	7,727	8,538	9,694	10,472	31

Source: 1930 data from *Census of Population*; 1940 and 1950 data from *Census of Agriculture*; 1954 and 1956 data were estimated.

³ In area, the Eighth Federal Reserve District includes all of Arkansas, 85 per cent of Missouri, 56 per cent of Kentucky, 45 per cent of Mississippi, 37 per cent of Illinois and 26 per cent each of Indiana and Tennessee.

from 10.5 million to 7.2 million, or 31 per cent. The district decline was more rapid than that of the nation, dropping from 1.6 million to 982,000, or 38 per cent. The decrease in number of district workers was not uniform from state to state, the district portion of Mississippi having the greatest decline of over 50 per cent during the period. Arkansas was next with a 46 per cent reduction, followed by declines of 42 per cent in district Tennessee and 31 per cent in district Kentucky. The reduction in the district portions of other states was less than the national average.

A partial explanation for this disparity in farm labor shifts within the district can be found by comparing farm wage rates with rates paid workers in alternative types of employment (Table 2). There

TABLE 2
IN 1954 AVERAGE HOURLY EARNINGS OF PRODUCTION
WORKERS IN MANUFACTURING IN DISTRICT STATES
EXCEEDED EARNING OF FARM WORKERS
BY WIDE MARGINS.¹

	AVERAGE HOURLY EARNINGS	
	PRODUCTION WORKERS IN MANUFACTURING ²	FARM WORKERS ³
Arkansas	\$1.25	\$0.57
Illinois	1.91	1.02
Indiana	1.98	0.99
Kentucky	1.66	0.67
Mississippi	1.18	0.53
Missouri	1.78	0.92
Tennessee	1.45	0.52

¹ Averages are for entire state.
² BLS, *Employment and Earnings* (Annual supplement 1956).
³ USDA, *Farm Labor* (January, 1955).

is little point in belaboring minor differences in living costs between rural and urban areas, since such differences would account for only a small portion of the wide variation in earnings between hired farm workers and production workers in manufacturing. Such differences as exist fail to explain the wide variation in farm wage rates among the district states. It may be argued that wage rates do not apply to most farm workers in the area since over half of Eighth District farm workers are farm operators. However, the disparity in realized net income per farm in district states is greater than that of wage earners (Table 3). Moreover, in the states with low

TABLE 3
IN 1954 REALIZED NET INCOME PER FARM VARIED
WIDELY BETWEEN DISTRICT STATES.¹

Arkansas	\$1,839
Illinois	3,787
Indiana	2,911
Kentucky	1,672
Mississippi	1,260
Missouri	2,245
Tennessee	1,357

¹ USDA, *The Farm Income Situation*. Averages are for entire state.

income per farm, the average farmer's net income is only about half that of the average factory worker.

In general, states with the lowest average hourly earnings for farm workers had the greatest decline in number of workers. Furthermore, the gap between farm wage rates and factory earnings is relatively large in those states where farm wage rates are low. This greater incentive to nonfarm employment has doubtless been an important factor in the rapid reduction of the farm labor force in the district portions of Tennessee, Arkansas and Mississippi.

In the absence of appealing subjective values one might expect the incentive of greater earnings to pull workers out of agriculture until the returns per worker remaining are comparable to returns in other occupations. If total farm output, nonlabor costs and prices remain constant, it follows that as the number of farm workers declines, the average net income per worker must increase. Many units classified as farms in the Census are operated primarily to produce food for home use, and the shift of workers from such subsistence farms to other industries has little effect on total farm output. However, such shifts enhance average farm product sales per worker remaining in agriculture. The reduction of farm workers on commercial farms may also increase earnings per worker. Often a smaller number of workers can maintain production on a farm at or near the current level and reduce per unit costs by using additional machinery. Greater earnings per worker remaining on such farms will be achieved as long as the additional substitution of machine power and equipment is profitable.

A number of forces have contributed to excess labor in agriculture. Before 1940 the rate of population growth was faster in the rural areas than in urban centers, and many more boys were reared on farms than were needed to replace retiring farm operators and wage earners. This factor alone has necessitated a large transfer of workers from farm to nonfarm occupations. Moreover, the recent upsurge in farm mechanization requires more acres and fewer workers for efficient operations. Often the nonfarm job not only requires the movement of farm workers to distant locations but also requires a willingness to accept the specific conditions of the new job. The costs of moving from the farm to locations where other employment opportunities exist are both objective and subjective. Money costs are not to be underrated; individual migrants generally have

limited assets for financing such shifts, and provision must be made for maintenance while looking for work or awaiting the first pay check. The process is further complicated for workers with families and those who have reached 35 or 40 years of age. Doubtless this group of workers approaching middle age rates fairly high the possibility of failure, and the social consequences of a forced return to their former communities are strong deterrents. Also, with early retirement provisions in effect, employers are reluctant to hire new employees at this age. The most important costs, however, are probably subjective. The worker leaving the farm must trade personal friendships and known social customs for uncertainty. Furthermore, the lack of familiarity with other occupations creates doubts as to personal happiness and satisfaction which undoubtedly affect willingness to change occupations.

The lack of knowledge of alternative employment opportunities often makes it difficult for the farm worker to obtain employment in other industries. Such knowledge can usually be obtained only by personal investigation because of the absence of standardized categories of labor services. The particular qualities and characteristics of labor are not easily measured, nor can the inexperienced readily interpret the requirements of a specific job. Thus, information found in want ads will not likely be sufficient for the average farm worker to make this important decision.

An additional influence inhibiting the transfer of workers out of agriculture is the loss of self-sufficiency. Many farm operators continue to provide for a large proportion of the family food requirements from home-grown produce. Furthermore, most farmers do their own building maintenance such as house painting and plumbing repairs and minor building installations and changes.

... and fewer farm units are required, ...

Along with the shift in labor from farm to other occupations has gone a persistent growth in size of farms and a corresponding decrease in total number of farms. Between 1930 and 1954, the number of farms declined approximately 30 per cent in the district compared to 24 per cent in the nation. The greatest decline in number, and hence greatest relative increase in size, occurred in the district portions of Tennessee, Arkansas and Mississippi, where the farms were smallest at the beginning of the period

(Tables 4 and 5). It will also be noted that these states had the lowest average hourly earnings per farm worker in 1954. Indiana, Illinois and Missouri, with the highest earnings per farm worker, had the smallest decline in number of farms during the period.

TABLE 4
THE NUMBER OF FARMS IN THE DISTRICT HAS DECLINED STEADILY SINCE 1930.

EIGHTH DISTRICT PORTION OF STATE	NUMBER OF FARMS				PER CENT DECREASE 1930-1954
	1954	1950	1940	1930	
Arkansas	145,392	182,366	216,674	242,334	40
Illinois	67,191	75,988	86,129	85,894	22
Indiana	37,715	40,643	46,927	46,765	19
Kentucky	104,999	120,547	131,359	137,037	23
Mississippi	122,184	148,796	174,402	195,561	36
Missouri	166,296	189,830	210,530	210,013	21
Tennessee	60,241	69,737	72,947	82,056	27
Eighth District	703,920	828,097	938,968	999,680	30
United States	4,782,393	5,382,162	6,096,799	6,288,648	24

Source: *Census of Agriculture*. The Census definition of a farm varies slightly from one census year to another.

TABLE 5
FARM SIZE HAS INCREASED.

EIGHTH DISTRICT PORTION OF STATE	AVERAGE SIZE OF FARMS IN ACRES				PER CENT INCREASE 1930-1954
	1954	1950	1940	1930	
Arkansas	124	103	83	66	88
Illinois	156	142	126	124	27
Indiana	121	115	103	103	17
Kentucky	111	99	92	86	29
Mississippi	89	75	59	48	85
Missouri	171	154	136	133	29
Tennessee	88	79	73	60	47
Eighth District	127	111	96	86	48
United States	242	215	174	157	54

Source: Computed from data in tables 4 and 6.

... but total land in farms has not changed greatly.

The growth of agricultural output for human use, notably enhanced by production on acres released from growing feed for horses and mules, has taken place in both district and nation on a fairly constant acreage of farm land. After rising gradually from 1930 to 1950, total farm acreage has actually declined in the past few years. Over the entire quarter century 1930-1954, the nation's acreage of land in farms increased only 12 per cent. This compares with a district increase of 4 per cent, most of it in

TABLE 6
TOTAL LAND IN FARMS HAS CHANGED LITTLE.

EIGHTH DISTRICT PORTION OF STATE	FARM LAND IN THOUSANDS OF ACRES				PER CENT CHANGE 1930-1954
	1954	1950	1940	1930	
Arkansas	18,005	18,868	18,045	18,053	+12
Illinois	10,847	10,830	10,861	10,676	-0
Indiana	4,553	4,698	4,843	4,836	-6
Kentucky	11,634	11,924	12,061	11,719	-1
Mississippi	10,839	11,170	10,447	9,460	+15
Missouri	28,402	29,196	28,805	27,875	+2
Tennessee	5,315	5,491	5,308	4,930	+8
Eighth District	89,395	92,177	90,390	85,549	+4
U. S.	1,158,223	1,158,566	1,060,852	986,771	+12

Source: *Census of Agriculture*. The Census definition of farm land varies slightly from one census year to another.

the Mississippi River Delta area following the installation of flood control measures and drainage projects. The district portion of Mississippi had the greatest proportional increase, moving up 15 per cent. Arkansas was next, with a 12 per cent gain, most of it during the 1930 decade. A decline in farm land acreage occurred in the remaining district states between 1950 and 1954, probably because of transfers of farm land exclusively into timber production. At any rate, the declines were greatest in the heavily-forested areas of Arkansas and Missouri.

This increase in size of farms reflects not only the adoption of new ways of farming but also the greater managerial ability of present-day farm operators. Like any business, the farm is a decision-making unit involving the organization of resources (land, labor and capital) and risk-taking. Some risks occur with a sufficient degree of regularity to be insured against; others are not insurable. The farm operator must incur such noninsurable risks, and the ability to carry such risks successfully will largely be determined by the skill and amount of training received by the farm operator. As agriculture moves full speed ahead to adopt farm improvements, increasing farm size will require greater managerial ability to make successful farm operators.

This internal transformation of agriculture in the district has involved more land per worker, . . .

During the last quarter century, progress toward increasing economic efficiency in district agriculture through more productive resource combinations has been phenomenal. One apparently vital aspect of the re-combination seems to be more land per worker. Studies have shown that with inadequate acreage the adoption of improved practices will enhance the existing levels of output and family living but a satisfactory minimum income often cannot be attained. Such is the case on many district farms.

The average number of acres per farm worker in the district increased from 54 acres in 1930 to 84 in 1954, an increase of 55 per cent (Table 7). The

TABLE 7
BUT WITH DECLINING FARM POPULATION, FARM LAND PER WORKER HAS INCREASED MARKEDLY.

EIGHTH DISTRICT PORTION OF STATE	ACRES OF LAND PER FARM WORKER				PER CENT INCREASE 1930-1954
	1954	1950	1940	1930	
Arkansas	80	72	58	42	90
Illinois	101	96	90	83	21
Indiana	83	80	79	75	11
Kentucky	78	71	68	58	33
Mississippi	57	53	39	27	117
Missouri	113	105	98	92	23
Tennessee	63	58	52	37	71
Eighth District	84	78	66	54	55
United States	150	136	109	94	59

Source: *Census of Agriculture*. Land in farms divided by number of workers.

national increase for the period was 59 per cent. Greatest district increases occurred in Arkansas and Mississippi where acres per worker went up 90 and 117 per cent, respectively. Tennessee was next with a 71 per cent rise, and smaller increases were observed in the district portions of Illinois, Indiana, Kentucky and Missouri.

... more livestock per worker, ...

Another major resource adjustment in the district was an increase of livestock per worker. With the exception of chickens, sheep and lambs, all major types of livestock on district farms increased substantially from 1930 to 1954. Cattle and calves almost doubled in both the district and nation, and a similar increase occurred in hog and pig numbers. Chickens four months old and over declined substantially in the district, while holding almost constant nationally. Sheep and lambs declined over 50 per cent for the district and approximately 25 per cent in the nation.

The livestock-per-worker changes can be demonstrated more clearly by grouping all types of livestock into one common unit: the dollar value of livestock. Animals were converted into dollars by applying January 1, 1950 values per head to the total number of animals of each species.⁴ With prices held

TABLE 8
AT CONSTANT VALUES PER HEAD, THE TOTAL VALUE OF LIVESTOCK ON FARMS HAS INCREASED MORE IN THE DISTRICT ...

	IN THOUSANDS				PER CENT CHANGE 1930-1954
	1954	1950	1940	1930	
All cattle and calves....	\$ 923,814	\$ 778,077	\$586,793	\$489,872	+89
All hogs and pigs.....	165,948	200,346	123,151	92,335	+80
Chickens					
4 mos. old and over.....	41,113	44,491	46,112	54,537	-25
Sheep and lambs.....	23,091	31,466	36,006	54,757	-58
Total.....	\$1,153,966	\$1,054,380	\$792,062	\$691,501	+87

... THAN IN THE UNITED STATES AS A WHOLE.

	IN THOUSANDS				PER CENT CHANGE 1930-1954
	1954	1950	1940	1930	
All cattle and calves..	\$11,783,399	\$ 9,518,545	\$7,523,667	\$6,727,037	+75
All hogs and pigs....	1,552,928	1,515,638	925,813	1,012,193	+53
Chickens					
4 mos. old and over...	511,832	485,750	459,611	515,274	-1
Sheep and lambs.....	562,725	558,685	714,301	743,686	-24
Total..	\$14,410,684	\$12,058,618	\$9,623,392	\$8,998,190	+60

Source: Estimated by multiplying numbers of livestock by the January 1, 1950 value per head.

⁴ Value per head obtained from *Agricultural Statistics*.

constant, changes in total value from year to year are the result of changes in numbers only. At these constant prices the total values of the major types of productive livestock in the district increased from \$692 million in 1930 to \$1,154 million in 1954, an increase of 67 per cent. The national increase for the period was 60 per cent (Table 8).

An examination of the per worker increase of capital in the form of productive livestock further reveals the speed of change in productive resources on district farms. At constant prices the value of productive livestock per worker on district farms increased from \$439 in 1930 to \$1,088 in 1954, an increase of 148 per cent (Table 9). The increase for the nation

TABLE 9
AT CONSTANT VALUES PER HEAD, THE TOTAL VALUE OF LIVESTOCK PER WORKER¹ ON FARMS IN DISTRICT AND NATION HAS MORE THAN DOUBLED SINCE 1930.

EIGHTH DISTRICT PORTION OF STATE	PER CENT INCREASE 1930-1954				
	1954	1950	1940	1930	
Arkansas.....	\$ 630	\$ 461	\$ 317	\$198	218
Illinois.....	1,800	1,487	1,058	909	98
Indiana.....	1,442	1,151	778	658	119
Kentucky.....	1,002	956	585	426	135
Mississippi.....	477	326	199	113	322
Missouri.....	1,788	1,503	1,072	994	80
Tennessee.....	630	512	343	203	210
Eighth District..	\$1,088	\$ 887	\$ 579	\$439	148
United States...	\$1,865	\$1,412	\$ 993	\$859	117

¹ Includes all livestock listed in Table 8.

Source: Number of workers from Table 1. Total value of livestock from Table 7.

during the period was only 117 per cent. However, the value of productive livestock per worker on district farms in 1954 was still only about 60 per cent of the United States average.

The diversity of the rate of change in livestock per worker in the various states is substantial. Although Mississippi still had less than 50 per cent of the district average, its increase was over 300 per cent during the 1930-1954 period. Livestock per worker increased more than 200 per cent in Arkansas and Tennessee. Indiana and Kentucky follow with an increase in excess of 100 per cent, or approximately the average increase for the nation. Missouri and Illinois, the two states which have almost the national average of livestock per worker, had the smallest increase during the period.

... more farm machinery ...

Further evidence that district farmers are becoming highly capitalized specialists is the rapid increase of farm machinery on district farms. Eighth District farmers were later than those of other parts of the nation in making extensive use of modern machinery. In 1930 the district had approximately 15 per cent

TABLE 10
MECHANIZATION AND USE OF ELECTRICITY ON FARMS IN THE
DISTRICT HAVE CONTINUED TO GROW SUBSTANTIALLY
IN THE PAST FEW YEARS.

	THOUSANDS OF UNITS				PER CENT
	1954	1950	1940	1930	INCREASE 1940-1954
Autos.....	456	448	411	433	11
Motor trucks.....	320	251	88	56	262
Tractors.....	479	357	107	57	346
Grain combines.....	104	70	n.a.	n.a.	
Corn pickers.....	78	39	n.a.	n.a.	
Pick-up balers.....	45	24	n.a.	n.a.	

Electricity (farms reporting).....	643	554	289	n.a.	123

Source: *Census of Agriculture*.
n.a.—Not available.

of the nation's farms and only 6 per cent of the nation's tractors. However, since 1930 progress in the use of labor-saving machinery and equipment has been marked. By 1954 numbers of tractors had increased over 300 per cent, whereas the nation's total increased only about 200 per cent. Despite this rapid increase the district continues to lag behind the nation in the use of tractor power, having only two tractors for every three farms, whereas the national average is almost one tractor per farm.

Mechanization has also come through machines other than tractors, the most dramatic increase in labor productivity having come in harvesting. One man with a two-row corn picker-husker can do the work of ten to fifteen men using former hand methods. Self-propelled combines have made the reaper obsolete for grain and soybean harvesting. The machine cotton picker enables one man to harvest four or five bales of cotton per day or the equivalent of approximately fifteen days of hand labor. The pick-up hay baler has increased the efficiency and taken much of the drudgery out of hay harvesting. These and other machines have been employed by district farmers in significant numbers during recent years (Table 10). Furthermore, electricity was used by almost all district farmers in 1954, often replacing hand labor in such operations as livestock feeding, water pumping, milking and housekeeping activities.

... and the application of many additional improvements in production techniques.

Changes in the use of production techniques not so readily measurable as those just mentioned have strongly influenced farm production efficiency. Use of lime and commercial fertilizer has accelerated since the outbreak of World War II. Hybrid seed corn has increased corn yields by approximately 20 per cent over the open pollinated varieties. Better varieties of seed have aided in pushing upward yields of such crops as oats, wheat, cotton and vegetables.

Improved methods for controlling insect pests and plant diseases have also been factors in increasing crop yields. More recently, irrigation equipment has been installed on a wide scale on farms in areas normally considered humid; with this equipment farmers can increase yields of most crops substantially.

Recent changes in techniques have also been important in the production of livestock and livestock products. Farmers are feeding better balanced feeds with respect to protein and other nutrients. Vitamins and antibiotic feed supplements containing growth promoting properties contribute to greater output per unit of feed. Improvement in breeds and a lower mortality rate in young animals because of better care and control of disease have also been factors in increasing the efficiency of livestock production.

The resource changes have resulted in more efficient performance on district farms.

When measured by Census values of products sold, the story of agriculture's performance is overstated during the quarter century 1929-1954, since such values include the increment resulting from the increase in the price level of farm commodities. Moreover, Census data measure output for only one year and the selected year may vary from aver-

TABLE 11
THE VALUE OF FARM PRODUCTS SOLD HAS INCREASED MORE
IN THE NATION AS A WHOLE THAN IN THE DISTRICT,
1954 COMPARED TO 1930 . . .

EIGHTH DISTRICT PORTION OF STATE	IN THOUSANDS				PER CENT IN- CREASE
	1954	1949	1939	1929	1929-1954
Arkansas.....	\$ 491,765	\$ 392,851	\$ 118,285	\$ 187,170	163
Illinois.....	311,574	296,778	87,468	104,025	200
Indiana.....	139,369	118,451	32,289	44,142	216
Kentucky.....	265,967	256,235	77,332	98,325	171
Mississippi.....	312,003	244,026	75,967	157,580	98
Missouri.....	581,770	558,307	165,057	248,255	134
Tennessee.....	144,937	134,649	36,571	62,638	131
Total Eighth District.....	\$ 2,247,385	\$ 2,001,297	\$ 592,869	\$ 902,135	149
Total U. S. . .	\$24,644,477	\$22,051,129	\$6,681,581	\$9,609,925	156

. . . PARTICULARLY WHEN COMPARED IN TERMS
OF 1949 DOLLARS.¹

EIGHTH DISTRICT PORTION OF STATE	IN THOUSANDS				PER CENT IN- CREASE
	1954	1949	1939	1929	1929-1954
Arkansas.....	\$ 447,059	\$ 392,851	\$ 937,957	\$ 311,950	43
Illinois.....	288,434	296,778	224,277	185,759	55
Indiana.....	134,009	118,451	80,723	74,817	79
Kentucky.....	239,810	256,235	208,735	196,650	22
Mississippi.....	281,084	244,026	230,203	267,085	5
Missouri.....	576,010	558,307	434,361	468,406	23
Tennessee.....	128,263	134,649	107,562	109,891	17
Eighth District.....	\$ 2,094,529	\$ 2,001,297	\$ 1,623,818	\$ 1,614,558	30
Total U. S. . .	\$24,644,477	\$22,051,129	\$17,583,108	\$16,288,008	51

¹ Total sales from *Census of Agriculture* converted to 1949 dollar values.

Source: *Census of Agriculture*

age conditions because of vagaries of weather. Such value of sales data are useful, however, for making comparisons of relative change in farm output in different areas over the same periods of time.

Calculations for the period 1929-1954 reveal that the greatest increases in value of Eighth District products were made in the district portions of Indiana and Illinois, where sales rose 216 and 200 per cent, respectively (Table 11). District Kentucky and Arkansas rose slightly faster than the United States average. Increases for district portions of Missouri, Tennessee and Mississippi were well below the national average for the period. For the entire district, value of farm products sold increased less than that of the nation.

... measured in value of products sold per worker at constant prices.

The improvement resulting from new combinations of economic resources on district farms can best be measured by output in constant dollar terms (Table 11). Technological advances in agriculture have led to a remarkable increase in value of farm products sold per worker. The increases were especially great during the years 1940-1954 (Table 12).

TABLE 12
THE VALUE OF PRODUCTION PER WORKER AT CONSTANT PRICES HAS GREATLY INCREASED IN A GENERATION.

EIGHTH DISTRICT PORTION OF STATE	VALUE OF FARM PRODUCTS SOLD PER WORKER BASED ON 1949 PRICES				PER CENT INCREASE 1929-1954
	1954	1949	1939	1929	
Arkansas	\$1,976	\$1,491	\$ 994	\$ 812	143
Illinois	2,732	2,626	1,861	1,444	89
Indiana	2,441	2,014	1,315	1,153	112
Kentucky	1,604	1,526	1,171	979	64
Mississippi	1,489	1,150	850	748	99
Missouri	2,293	2,005	1,476	1,539	49
Tennessee	1,514	1,414	1,048	815	86
Eighth District..	\$1,974	\$1,683	\$1,187	\$1,025	93
Total U. S.	\$3,189	\$2,583	\$1,814	\$1,555	105

Source: Derived from Tables 1 and 11.

During the quarter century 1929-1954, even after adjustment for price change, average district output per farm worker almost doubled, and in Arkansas the output increased 143 per cent. The district portion of Indiana was next with an increase of 112 per cent, followed by Mississippi with 99 per cent, Illinois 89 per cent, Tennessee 86 per cent, Kentucky 64 per cent and Missouri 49 per cent.

The productivity increase per worker on district farms was substantial, averaging 93 per cent. That for the nation was even greater, averaging 105 per cent.

Consumers, particularly, have benefited.

This increased farm productivity has been of special benefit to consumers. Output of food and fiber products has been increased, providing consumers with an abundant supply at lower cost. Increased efficiency has released workers from agriculture to produce nonfarm products and services on which consumers presently prefer to spend a larger portion of their incomes.

On the other hand, the technological advance has brought problems as well as gains to agriculture. Surpluses of many crops such as cotton, wheat and corn have developed. The social structure of many rural communities has been altered as families have moved to urban centers seeking more profitable employment. Balancing these dislocations, however, is the greater ease of performing farm chores. Mechanical power and equipment on the farm and in the farm home have taken much of the drudgery out of agriculture, giving the farm family more time for relaxation and recreation.

CLIFTON B. LUTTRELL



Survey

OF CURRENT CONDITIONS

Released for publication on April 1

BUSINESS ACTIVITY in the Eighth Federal Reserve District remained at a high level during most of March. The over-all stability of business activity was reflected in the usual decline in insured unemployment. But as the month closed there were evidences of slowdown in some lines of activity. Automobile production was reduced after mid-February and further cutbacks were scheduled for April. This cutback was reminiscent of those last year, caused by large inventories and lagging retail sales. The curtailment of activity in the automobile industry was reflected in a drop in steel production in the nation. District mills, less dependent upon automobile business, however, continued activity at a high rate. Further similarities in the business picture this year and a year ago could be found in residential construction, business investment and government spending. The number of new housing starts continued to decline in February. Business investment in new plant and equipment was apparently continuing to expand although at a somewhat slower pace than in 1956. Federal spending for national defense purposes increased sharply in February and in March was substantially larger than a year earlier.

Industrial activity in the district maintained about the usual pattern during February and early March though with a few more minus than plus comparisons to a month and a year ago. Steel mills in the St. Louis area operated at about 97 per cent of capacity in February and March, up slightly from January but behind the over-capacity operations of a year earlier. However, the stable operating rates of St. Louis area mills contrasted with national rates, which have declined in recent weeks. Coal mining continued to lag behind a year ago in both nation and district. Crude oil production continued as in recent months to maintain a margin above last year although cut back slightly during February in the district.

Automobile production showed divergent trends in the district. In February one producer reduced output while others ran extra schedules. In March normal work-weeks were scheduled, but late in the month excessive stocks again brought production cutbacks. In Louisville truck engine and tractor output picked up during the month, and hiring was scheduled to start in April for a new make of automobile. Though output of household durables was

not back to normal, there was some gain in refrigerator production.

Lumber production continued weak. Both pine and hardwood operations failed to make their usual seasonal upturn in February and operations remained below year-ago levels during March. Outlook for the industry is dimmed by the general decline in residential construction.

Livestock slaughter at major district meat packing centers during January and February was about 5 per cent below those months of last year, except in the Memphis area. The drop was chiefly in hog slaughter. This trend continued in March in the St. Louis area.

Cutbacks in shoe production in Missouri during February resulted in widespread temporary layoffs, but operations were restored early in March.

Nonresidential construction contracts awarded in a large part of the Eighth Federal Reserve District in January and February were somewhat less than a year earlier. Residential building awards, however, were greater, reflecting the inclusion of an 800-unit public housing project in Little Rock, Arkansas, costing \$9 million, and 2,042 government owned dwelling units costing \$27 million at Fort Knox, Kentucky. In most of the metropolitan areas, residential awards were less than in the comparable period last year. The weakness in residential construction apparent in most of the district was roughly comparable to that which has been experienced for some time in the nation. In February the number of privately owned permanent nonfarm dwelling units started fell to a seasonally adjusted annual rate of 910,000 compared with 1,127,000 a year earlier. District construction awards were also boosted by the inclusion of awards for large electric power projects, including \$20 million for a generating station to serve the aluminum reduction plant being built near Evansville, Indiana.

Employment in the district's six major labor market areas was unchanged from January to February, as gains in manufacturing were canceled by losses in nonmanufacturing industries. Manufacturing employment was slightly above February a year ago, but nonmanufacturing employment was about the same. Contributing to the gains in manufacturing from January to February were hiring of workers in the refrigerator industry at Evansville and aircraft

industry in St. Louis, and the recalling of workers who had been previously laid off in the farm equipment industry at Memphis and the apparel industry at Little Rock. In February nonfarm employment in the six largest metropolitan areas of the district averaged about the same as a year earlier, while in the nation there were about 2 per cent more employed.

In the six-week period from early February to late March claims for unemployment insurance in Evansville and Louisville decreased about as much as in the same period last year. In St. Louis there was a larger drop in insured unemployment this year while in Memphis almost no change occurred compared with an increase last year. The number of unemployed in Louisville was still substantially higher than last year but should be reduced in the near future by hirings scheduled in the appliance and motor vehicle industries. Unemployment in the St. Louis area was slightly greater than in March 1956, and the erosion of job opportunities was especially large. During March and April it is expected that about 3,000 workers will have been laid off as a result of transfer of the offices of two firms to other areas, closing of a brewery and elimination of a second shift at a motor vehicle assembly plant.

In the four weeks ending March 23 district department store sales declined from the corresponding calendar weeks last year. However, the decline in sales should not be interpreted as reflecting a change in consumers' buying attitudes. Instead, the decline was in large part because of the later date of Easter this year than last and the different timing of seasonal promotions. The basic trend of district sales was perhaps better revealed by the January and February reports which showed sales at the same level as a year earlier. Durable goods sales, however, continued weak. Sales of home furnishings lagged at department stores and new automobile sales also were slow. In Louisville, Kentucky, the number of new cars sold in the first two months of the year was about 25 per cent less than in the comparable period of 1956 and in January new passenger car registrations in Arkansas and Missouri were respectively 4 and 18 per cent less than in January 1956. No improvement was indicated in the first part of March when automobile sales in the nation failed to increase as hoped and continued to fall short of year earlier levels.

Judging from department store sales reports, consumer buying in the Eighth Federal Reserve District was not as strong as elsewhere in the nation. The difference reflected in part the relative lag of income and employment in the district.

Retail sales in the nation in the first two months of the year remained high and averaged 6 per cent more than in the corresponding period of 1956. The

favorable buying record of consumers reflected the improvement in their financial positions during 1956 and their continued optimism about the future. About 41 per cent of all spending units reported incomes of \$5,000 or more in 1956 compared with 36 per cent in 1955. In addition, the number of spending units reporting one or more types of liquid assets increased during the year. Optimism with respect to the future was more widespread in early 1957 than the year before, as indicated by the slightly larger proportion expecting further increases in their incomes during the year. However, plans of consumers to purchase major items during 1957 showed little change from early 1956, although the average dollar amount of planned expenditure was somewhat more than in 1956.

Prices held fairly steady in the first three weeks of March. The index of spot primary market commodity prices increased slightly in the period while the more comprehensive wholesale price index in the week ended March 19 was virtually the same as at mid-February. Consumer prices, however, continued to rise in February. Both wholesale and consumer price indexes averaged nearly 4 per cent higher than a year earlier.

The demand for bank credit showed some strength during the four weeks ended March 20, but the increase in loans was less than in the like period a year ago. Total volume of loans outstanding (except inter-bank) at district weekly reporting banks amounted to \$1,641 million on March 20, or $\frac{1}{2}$ of 1 per cent more than four weeks earlier. Net additions to indebtedness by businesses and farmers were partially offset by reductions in the other major loan categories. A sizable proportion of the borrowing by businesses was for tax purposes. The bulk of the growth in outstanding debt by these companies was concentrated in the manufacturing and mining groups. Sales finance companies also expanded their bank borrowings more than the average increase during comparable weeks of recent years. On the other hand commodity dealers made large seasonal net repayments, and public utilities and contractors reduced their outstanding bank loans somewhat.

Planting intentions for spring crops and decreased seeding of crops last fall indicate the smallest acreage of crops since World War I. Excluding cotton, the acreage of sixteen major spring planted crops may be two million acres less than last year. The following table indicates the intended plantings in the nation for major district crops, except cotton.

	(MILLION ACRES)		
	AVERAGE 1946-55	1956	INDICATED 1957
Corn	83.9	78.6	74.4
Spring Wheat . . .	19.7	16.2	12.9
Oats	44.2	44.6	43.5
Rice	1.9	1.6	1.4
Tobacco	1.7	1.4	1.1
Soybeans	14.9	22.0	22.7

VARIOUS INDICATORS OF INDUSTRIAL ACTIVITY

Industrial Use of Electric Power (Thousands of KWH per working day, selected industrial firms in 6 district cities)
 Steel Ingot Rate, St. Louis area (Operating rate, per cent of capacity)
 Coal Production Index—8th Dist. (Seasonally adjusted, 1947-49=100)
 Crude Oil Production—8th Dist. (Daily average in thousands of bbls.)
 Freight Interchanges at RR's—St. Louis. (Thousands of cars—25 railroads—Terminal R. R. Assn.)
 Livestock Slaughter—St. Louis area. (Thousands of head—weekly average)
 Lumber Production—S. Pine (Average weekly production—thousands of bd. ft.)
 Lumber Production—S. Hardwoods. (Operating rate, per cent of capacity)

	Feb. 1957	Feb. 1957* compared with	
		Jan. 1957	Feb. 1956
	n.a.	n.a.	n.a.
	98	+ 4	- 4
	87.8 p	+ 8	- 9
	394.4	- 0-	+ 4
	99.3	- 2	- 9
	116.6	+ 1	- 0-
	199.3	- 3	- 6
	84	+ 1	- 9

* Percentage change is shown in each case. Figures for the steel ingot rate, Southern hardwood rate, and the coal production index, show the relative percentage change in production, not the drop in index points or in percents of capacity.
 p Preliminary, n.a. Not available.

BANK DEBITS¹

	February 1957 (In millions)	February 1957 compared with	
		January 1957	February 1956
Six Largest Centers:			
East St. Louis—National Stock Yards, Ill.	\$ 132.7	-18%	+12%
Evansville, Ind.	174.3	-15	+16
Little Rock, Ark.	181.3	-11	+ 6
Louisville, Ky.	836.8	- 6	- 0-
Memphis, Tenn.	733.8	-17	+ 5
St. Louis, Mo.	2,173.8	-14	+ 1
Total—Six Largest Centers	\$4,232.7	-13%	+ 3%
Other Reporting Centers:			
Alton, Ill.	\$ 32.8	-16%	- 8%
Cape Girardeau, Mo.	16.5	-25	+16
El Dorado, Ark.	27.2	-16	- 2
Fort Smith, Ark.	51.1	-19	- 1
Greenville, Miss.	26.4	-19	- 5
Hannibal, Mo.	9.8	-16	+ 5
Helena, Ark.	8.1	-26	+ 8
Jackson, Tenn.	23.8	-17	- 9
Jefferson City, Mo.	71.3	-43	+ 5
Owensboro, Ky.	49.2	-14	+13
Paducah, Ky.	25.8	-11	+ 1
Pine Bluff, Ark.	37.4	-20	+ 3
Quincy, Ill.	36.5	-16	+ 7
Sedalia, Mo.	14.3	-20	+ 2
Springfield, Mo.	78.8	-20	+ 9
Texarkana, Ark.	17.6	-15	- 4
Total—Other Centers	\$ 526.6	-22%	+ 3%
Total—22 Centers	\$4,759.3	-14%	+ 3%

INDEX OF BANK DEBITS—22 Centers
 Seasonally Adjusted (1947-1949=100)

	1957		
	Feb.	Jan.	Feb.
	175.0	174.6	170.3

¹ Debits to demand deposit accounts of individuals, partnerships and corporations and states and political subdivisions.

CASH FARM INCOME

	Percentage Change		
(In thousands of dollars)	Jan. 1957	Jan. '57 from Jan. '56	Jan. 1957 compared with Jan. 1955
Arkansas	\$ 45,979	+ 3%	+45%
Illinois	198,507	+27	+39
Indiana	96,615	+17	+18
Kentucky	70,940	+13	-34
Mississippi	35,747	-25	-15
Missouri	69,098	- 4	+ 7
Tennessee	40,375	+ 7	+17
7 States	557,261	+10	+11
8th District	241,616	+ 1	+ 4

Source: State data from USDA preliminary estimates unless otherwise indicated.

INDEX OF CONSTRUCTION CONTRACTS AWARDED EIGHTH FEDERAL RESERVE DISTRICT¹ (1947-1949=100)

	Jan. 1957	Dec. 1956	Jan. 1956
Unadjusted			
Total	n.a.	n.a.	177.3
Residential	n.a.	n.a.	223.5
All Other	n.a.	n.a.	155.9
Seasonally adjusted			
Total	n.a.	n.a.	234.1
Residential	n.a.	n.a.	302.0
All Other	n.a.	n.a.	202.5

¹ Based on three-month moving average (centered on mid-month) of value of awards, as reported by F. W. Dodge Corporation.
 n.a. Not available.

ASSETS AND LIABILITIES OF EIGHTH DISTRICT MEMBER BANKS

(In Millions of Dollars)

Assets	Weekly Reporting Banks		All Member Banks	
	March 20, 1957	Change from Feb. 20, 1957	Feb. 27, 1957	Change from Jan. 30, 1957
Loans ¹	\$1,641	\$+ 8	\$2,610	\$-13
Business and Agricultural Security	883	+18		
Real Estate	48	- 3		
Other (largely consumer)	274	- 0-		
U. S. Government Securities	462	- 7		
Other Securities	836	-11	1,840	-74
Loans to Banks	216	- 3	487	- 2
Cash Assets	14	+ 4		
Other Assets	895	+18	1,418	- 0-
Total Assets	43	+ 1	75	+ 2
Total Assets	\$3,645	\$+17	\$6,430	\$-87
Liabilities and Capital				
Demand Deposits of Banks	\$ 652	\$- 8	\$ 697	\$-40
Other Demand Deposits	2,030	+11	3,830	-36
Time Deposits	593	+ 2	1,310	+14
Borrowings and Other Liabilities	85	+11	86	-30
Total Capital Accounts	285	+ 1	507	+ 5
Total Liabilities and Capital	\$3,645	\$+17	\$6,430	\$-87

¹ For weekly reporting banks, loans are adjusted to exclude loans to banks; the total is reported net; breakdowns are reported gross. For all member banks, loans are reported net and include loans to banks; breakdown of these loans is not available.

DEPARTMENT STORES

	Net Sales			Stocks on Hand	Stocks-Sales Ratio	Percentage of Accounts and Notes Receivable Outstanding Feb. 1, '57, collected during Feb.	
	Feb., 1957 compared with Jan., '57	Feb., 1957 compared with Feb., '56	2 mos. '57 to same period '56			Instal. Accounts	Excl. Instalment Accounts
8th F.R. District Total	- 4%	- 2%	- 0-			15	46
Fort Smith Area, Ark. ¹	- 6	- 6	+ 1				37
Little Rock Area, Ark.	+ 1	- 5	+ 1			12	40
Quincy, Ill.	-13	-16	- 8				
Evansville Area, Ind.	- 5	- 0-	+ 4				
Louisville Area, Ky., Ind.	- 1	- 8	- 2			16	40
Louisville (City)	- 0-	-12	- 6				
Paducah, Ky. ¹	- 9	- 1	+10				
St. Louis Area, Mo., Ill.	- 5	- 0-	- 0-			16	57
St. Louis (City)	- 7	- 3	- 3				
Springfield Area, Mo.	+10	+ 8	+ 8				
Memphis Area, Tenn.	- 6	- 4	+ 2			14	31
All Other Cities ²	- 3	+ 3	+ 4				

¹ In order to permit publication of figures for this city (or area), a special sample has been constructed which is not confined exclusively to department stores. Figures for any such nondepartment stores, however, are not used in computing the district percentage changes or in computing department store indexes.

² Fayetteville, Pine Bluff, Arkansas; Harrisburg, Mt. Vernon, Illinois; Vincennes, Indiana; Danville, Hopkinsville, Mayfield, Owensboro, Kentucky; Chillicothe, Missouri; Greenville, Mississippi; and Jackson, Tennessee.

Outstanding orders of reporting stores at the end of February, 1957, were 3 per cent lower than on the corresponding date a year ago.

INDEXES OF SALES AND STOCKS—8TH DISTRICT

	Feb. 1957	Jan. 1957	Dec. 1956	Feb. 1956
Sales (daily average), unadjusted ³	98	94	216	96
Sales (daily average), seasonally adjusted ³	125	125	130	123
Stocks, unadjusted ⁴	n.a.	123	123	131
Stocks, seasonally adjusted ⁴	n.a.	141	136	138

³ Daily average 1947-49=100

⁴ End of Month average 1947-49=100

n.a. Not available.

Trading days: Feb., 1957—24; Jan., 1957—26; Feb., 1956—25.

RETAIL FURNITURE STORES

	Net Sales	
	Feb., 1957 compared with Jan., '57	Feb., '56
8th Dist. Total ¹	+ 21%	- 0%
St. Louis Area	+ 21	+ 1
Louisville Area	+ 17	- 0-
Memphis Area	+ 15	-25
Little Rock Area	+130	+19
Springfield Area	+ 1	-18

¹ In addition to the areas shown separately in the table, the total includes stores in Blytheville, Fort Smith, Pine Bluff, Arkansas; Owensboro, Kentucky; Greenwood, Mississippi; and Cape Girardeau, Missouri.

Note: Figures shown are preliminary and subject to revision.

PERCENTAGE DISTRIBUTION OF FURNITURE SALES

	Feb., '57	Jan., '57	Feb., '56
Cash Sales	14%	15%	14%
Credit Sales	86	85	86
Total Sales	100%	100%	100%