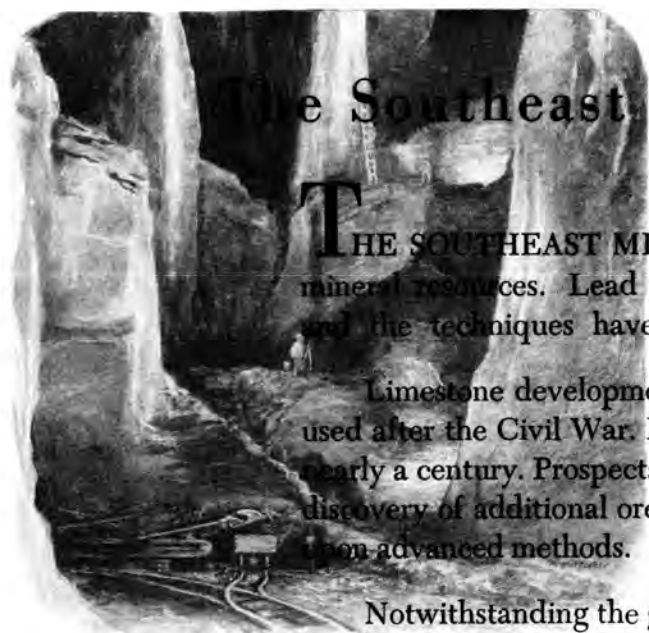


# Monthly Review

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## The Southeast Missouri Mining Region

**T**HE SOUTHEAST MISSOURI MINING REGION contains a number of mineral resources. Lead mining was started early in a primitive fashion, and the techniques have been continually improved.

Limestone development also began early, and glass sand was successfully used after the Civil War. Barite (or "tiff") has been produced in the region for nearly a century. Prospects for the iron industry have been boosted recently by discovery of additional ore deposits. Cobalt mining is particularly dependent upon advanced methods.

Notwithstanding the growth in manufacturing and continued reliance on agriculture throughout all six counties, mining activity—sustained by sizable reserves of ore—will remain an important source of income in the region.

**Federal Reserve Bank**  
*of St. Louis*



*Survey of Current Conditions—p. 105*

# The Southeast Missouri Mining Region

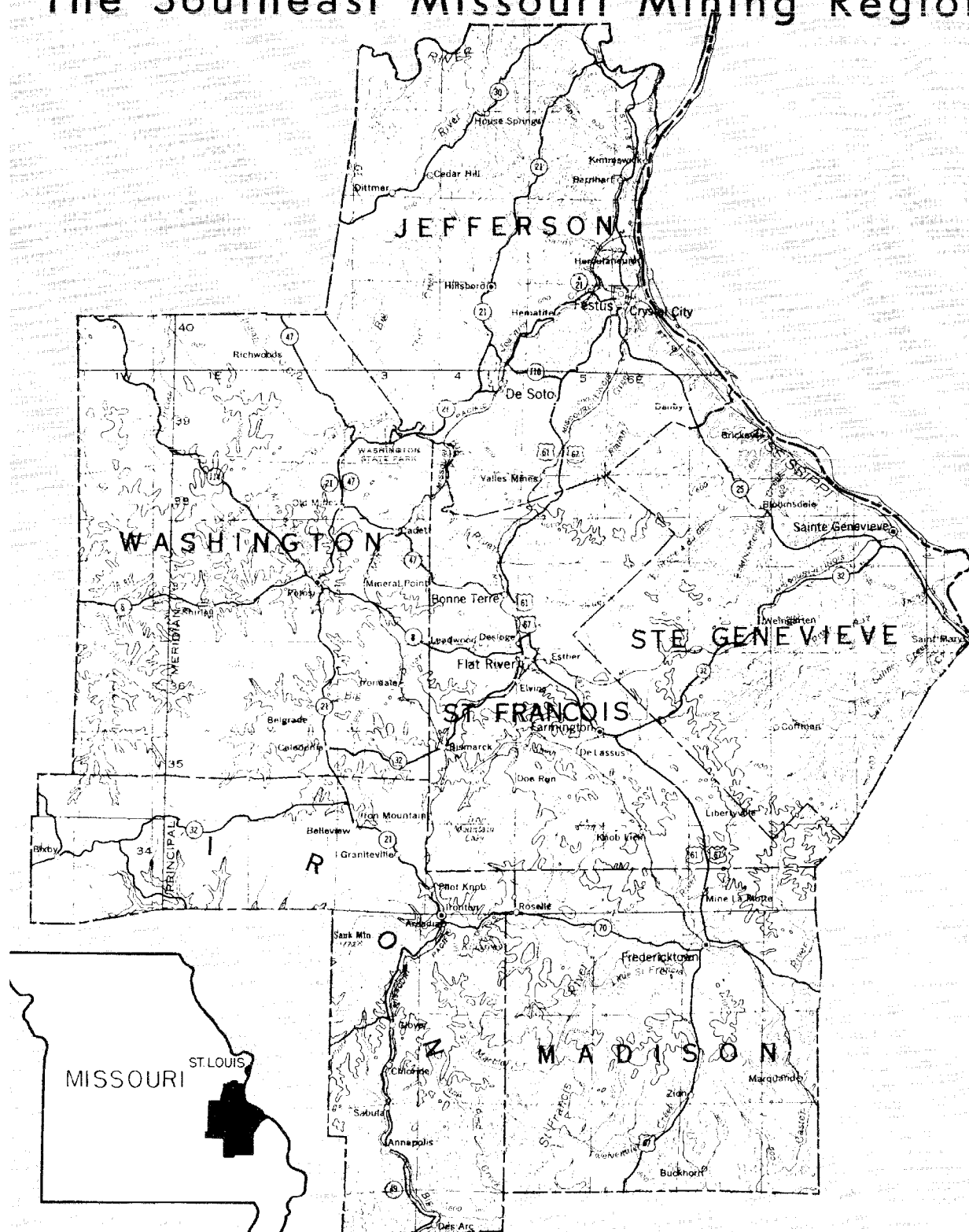


Figure 1

**T**HE SIX COUNTIES of the Southeast Missouri Mining Region, shown above, are located not far south of St. Louis (insert map). The region includes counties which have been closely identified with lead mining activities in their economic development. However, the area of most intense lead mining known as the "Lead Belt" (shown in Figure 2) is located principally in St. Francois County.

Source: *Missouri Base Map, with Highways and Contours*. Compiled in 1950, Highways corrected to 1952. U. S. Geological Survey and the State of Missouri.

**L**OCATED not far south of St. Louis is a mining region of considerable economic significance. Lead has been mined there for the last two-and-a-half centuries, and the region has been the principal producer of lead in the United States for the past half century. Moreover, other mineral assets are located there. Oil companies value the region's rich deposits of barite, used in drilling muds. Steel producers hundreds of miles distant use its chemically pure limestone as a flux in blast furnaces. Glass is made from high-quality silica sand at Crystal City. Another mineral deposit yields rare cobalt, and iron ore prospects have excited new hopes. In addition to mining activities, small factories, farms and forests are a prominent part of the economic landscape.

The six-county region, containing some 3,400 square miles, extends from Jefferson County on the north through St. Francois County to Madison County on the south, eastward to Ste. Genevieve County (bordered by the Mississippi River) and westward to Iron and Washington Counties (Map, figure 1).

A traveler in the region is sure to be impressed by the variety of the landscape for this is an Ozark border region which extends from a rugged out-cropping of crystalline rock on the southwest, known as the St. Francois Mountains, to broad flat lands along the Mississippi River on the east. In general, it is a land of exposed rock surfaces—of rock outcrops, ledges, overhanging cliffs, rocky streambeds and often gravelly fields. Resistant granite and other crystalline rocks form both the highest elevations, the St. Francois Mountains, and the underlying rock structure. Taum Sauk Mountain, which rises nearly 1,000 feet from adjacent valleys to a height of 1,772 feet above sea level, is the highest point in Missouri. The maps and the cross-section diagram, figure 2, illustrate the extent and geologic structure of this region.

*... contains a number of mineral resources.*

The importance of mining and its associated activities is evident everywhere. In the Bonne Terre-Flat River nucleus, chat piles over 200 feet high are evidence of the lead mines. The outstanding plant at Fredericktown, though well hidden in a valley, is a mine and refinery, handling complex cobalt-nickel ores. The iron mine with its waste pile is the only industrial plant in sight along the highway at Iron Mountain. At Crystal City is a huge glass works, and in a deep valley not far from the town of Ste.

Genevieve is the home of the Mississippi Lime Company. In Washington County, near Potosi, acres and acres of red soil lie exposed where the barite shovels have gouged the surface. Smaller quarries and gravel pits are also abundant. At Graniteville chunks of red granite, once used extensively for building stone and paving blocks in St. Louis, are still quarried on a small scale.

*Lead mining was started early in a primitive fashion, . . .*

Hernando DeSoto may have first explored the southern margin of Southeast Missouri in the 1540's, some 80 years before the Pilgrims reached Plymouth Rock. But commercial development of the region did not get under way for another century-and-a-half or more. And even after recognizable commercial activities, the history of the region appears to have been more a testimonial to man's ingenuity and persistence than to nature's bounty.

Following the development of the Mississippi Valley by the French, trade with the Indians and hunting and trapping were carried on from several villages on the east bank of the Mississippi. By the early 1700's settlers in log cabins to the west of the river were engaged in salt and lead mining and in farming. Ste. Genevieve, settled in the 1730's, became the political and commercial center of the region and held this position for many years. It was the seat of government, a focal point for river transportation and conveniently located near salt mines and a large plot of fertile bottomland.

Lead mining was developed on a small scale. Following several unsuccessful starts by others, Philippe Francois Renault succeeded in operating a mine (Mine La Motte) at a site just north of present-day Fredericktown until 1744 when he returned to France.



*The Louis Bolduc House at Ste. Genevieve.*

During the next half-century other mines were opened. But the entire output up to 1800 is estimated to have been only about 18,000 tons of lead.<sup>1</sup>

Lead ores were found near the surface in the early days and were mined by the simplest of methods.<sup>2</sup> Hard manual labor was required. What is more, the shallow open pits at times filled with water, and miners were exposed to both heat and cold. In dry weather there was insufficient water for separating waste materials from the ores. For these and other reasons the mines were only worked six months or or less of the year. Furthermore, the first crude furnaces, made of logs, yielded but little over half of the lead in the ore.

*... and the techniques have been continually improved.*

In the late 1700's French influence waned. A new group of settlers moved in from the eastern part of the continent and greatly expanded farming. Fighting off the Osage Indians, they founded small trade and milling centers along the Meramec and other streams.

Among the newcomers was Moses Austin, a Connecticut Yankee with some knowledge of lead mining techniques. Austin introduced a new type of furnace which recovered some 15 per cent more lead than the old log types then in use and soon replaced them. Austin also erected a shot tower at the mines and another at Herculaneum, a town which he established on the Mississippi River. More and more mines were developed. In 1811 there were about 350 men working the mines and by 1819 about 1,200. From the years 1841 to 1849 inclusive, about 10,000 tons of lead were produced in three of the mining counties.<sup>3</sup>

Throughout this early period of development heavy loads were moved by wagon over crude roads that were often little better than trails. Extension of railroads into the region beginning in the 1850's was a major factor in the emergence of the economy into "big business."

<sup>1</sup> Arthur Winslow, *Lead and Zinc Deposits*, Missouri Geological Survey, Vol. VI, Section 1, 1894, p. 271.

<sup>2</sup> Schoolcraft described the early mining techniques as follows:

The method of raising the ores, and the processes pursued in separating the metal, are, upon the whole, extremely simple. A pickaxe and shovel are the only tools in use for removing the earth; and the drill, rammer, and priming rod, are added when it is necessary to blast. Having determined the spot for digging, the process commences by measuring off a square of about eight feet, and throwing out the earth, spar, and gravel, until the miner sinks beneath the depth he can throw the earth. An expert hand will pitch his earth clear out of a pit from a depth of ten, twelve, and even fifteen feet. At this depth a common windlass and bucket are placed over the center of the pit, and the digging continued by drawing up the earth, spar, and ores, if any are found, in the manner of sinking a well. During his progress, the miner is notified of his approach to a body of ore, by small detached lumps occasionally found embedded in the soil, within a few feet of the surface. Sometimes lumps on the top of the ground determine on the place for digging.\*

\* Henry Rowe Schoolcraft, *Scenes and Adventures in the Semi-Alpine Regions of the Ozark Mountains of Missouri and Arkansas*, Lippincott, Grambo & Co., Philadelphia, 1853, p. 176.

<sup>3</sup> Henry C. Thompson, *Our Lead Belt Heritage*, Bonne Terre, Missouri, 1955, pp. 68, 84, 85. Estimates originally made by Brackenridge, Schoolcraft and Litton.

The disruption of the Civil War temporarily halted industrial expansion, but shortly thereafter the economy of the region began to assume the outlines of its present shape. In 1869 a diamond drill was first employed in lead mining operations. This drill penetrated into the limestone rock beneath the clays and obtained cores which could be examined to determine if prospects were favorable for sinking a shaft. Now a way had been found to plot future exploitation of the vast deposits of lead ore located in the lower levels of the horizontal limestone beds up to 500 feet thick which underlay the region.

Today, tunnels for mining lead, called "stopes," extend hundreds of miles underground and are served by more than 350 miles of railroad track. Electric engines hauling up to 200 tons of ore have replaced the mules once used. Power shovels, such as the locally developed "St. Jo Shovel" which loads at the rate of 25 tons an hour, have replaced the pick and shovel.<sup>4</sup> Some mines have hauling equipment which does not require tracks and two have large brilliantly lighted machine shops where engines, cars and other equipment can be completely rebuilt 450 feet below surface.

A major advance in the separation of lead from ores was the selective flotation process, which was first adopted in the Lead Belt in 1911. Other improvements followed. Because of the better techniques, ores are currently being mined at a yield of only 2 per cent lead, and old waste piles are being reworked. The milling process at one new mine is so efficient that it requires only 13 men, compared with 30 to 40 men for a like operation at older mills.

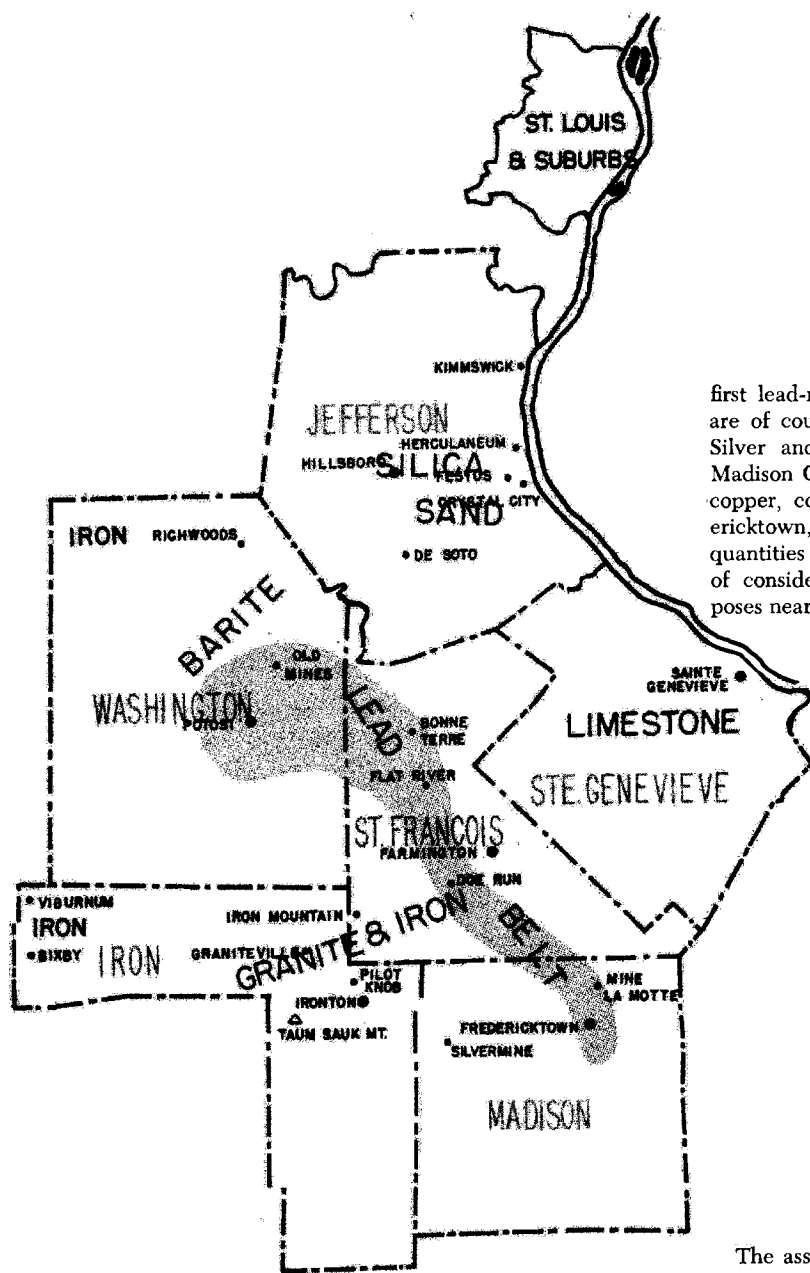
The region is now producing about 30 per cent of the lead mined nationally. The total value of output in 1956 was over \$32 million, according to preliminary estimates.

#### *Limestone development also began early, . . .*

Burning of limestone to obtain slacked lime or quicklime for use in plaster and mortar was begun in Ste. Genevieve County as early as 1840. Since that time production of agricultural and chemical limestone has also been developed. Today, strange as it may seem for this ubiquitous mineral, limestone from Southeast Missouri because of its purity is shipped widely throughout the United States for use in the nation's steel mills and other industrial purposes. Value of production is second only to lead among

<sup>4</sup> The miners themselves have devised many of the techniques and machinery. One recent device, known as the "schlook," is a cable extension operating on a trolley which enables a mining machine to be operated some 800 feet from the main power line.

# Map and Geologic Cross Section of the Southeast Missouri Mining Region



first lead-mining areas in the region. The mineral associations are of course more complex than this generalized map shows. Silver and tungsten have been produced at Silver Mine in Madison County, manganese in Madison and Iron counties, and copper, cobalt and nickel are currently being mined at Fredericktown, county seat of Madison County. Relatively small quantities of zinc are also recovered. A very pure limestone of considerable hardness has been quarried for building purposes near Ste. Genevieve.

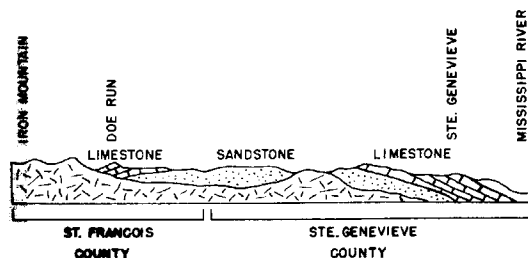


Figure 2

**F**IVE MINERAL SUBREGIONS can be identified in the Southeast Missouri Mining Region: lead, barite, iron and granite, lime, and sand. The Lead Belt, defined as that portion of Southeast Missouri from which lead is extracted in large quantities with no associated ore minerals of any consequence occurring with the lead, extends from Bonne Terre on the north to Doe Run on the south. Mine La Motte and Fredericktown are also sometimes included in the area. Shading on this map also identifies the Potosi-Old Mines area which was one of the

The association of minerals is represented by the generalized geologic cross section. Rising highest are the igneous knobs of granite and rhyolite. In the granite, workable concentrations of iron ore have been found, but much of the rock has not been prospected. Overlying this are beds of sandstone, shales and limestone. Where the limestone and sandstone make a mutual contact with the igneous rock, major associations of complex minerals, as at Fredericktown may be found. In other areas, the limestone carries long horizontal beds of disseminated lead with some veins of residual ore. Barite deposits are found at or near the surface in Washington County in connection with a softer limestone formation.

Geologic cross section after Charles R. Keyes, *Lead and Zinc Deposits*, Missouri Geological Survey Bulletin, Vol. VI, 1894, p. 349.

minerals of the region, amounting to more than \$9 million in 1956. Over 1,200 persons were employed in the quarries and processing operations.

*... and glass sand was successfully used after the Civil War.*

Similar problems and triumphs could be related for other mining activities in the area. As early as the 1860's use of the glass sand at the point where Platin Creek empties into the Mississippi, now the site of Crystal City, was planned by an American scientist, Dr. Bidwell. But this early venture was unsuccessful. A Captain Ward of Detroit took over the land from Bidwell, raised funds for development purposes and built a plant. But he too was unsuccessful and after his death his interests were sold to a group from St. Louis. This group imported skilled glassmakers from England, rebuilt and enlarged the factory and other facilities, and finally created a profitable enterprise. In 1895 the Pittsburgh Plate Glass Company bought the entire operation. The plant was rebuilt in 1908 and again in 1930 and has been improved and modified since. Today only from 25 to 30 men of some 3,000 employed are required to do the quarrying. Some idea of the value of glass output can be gained from the fact that company payrolls have exceeded \$18 million in each of the past two years.

*Barite (or "tiff") has been produced in the region for nearly a century.*

Barite mining, as another example, was carried on by pick and shovel from 1869 to the 1930's. Several thousand persons were digging the mineral to supplement their farm income. The "tiff," as barite is called locally, was thrown on a wagon and delivered to collecting points for shipment to St. Louis for processing. Today the whole process is mechanized. A power shovel can take over a ton at a bite and the ore is beneficiated on the spot in washers using up to 5,000 gallons of water a minute.

The area became the leading barite-producing district in the United States and held this position until 1944 when it was superseded by Hot Springs County, Arkansas. It remains in second place, however, with 385,000 tons of ore produced in 1956, compared with 480,000 tons in Arkansas, according to preliminary reports. These two districts together account for about 80 per cent of United States output. Value of production in Missouri in 1956 was an estimated \$4.2 million, most of which was in Washington County.

*Prospects for the iron industry have been boosted recently by discovery of additional ore deposits.*

After humble beginnings as early as 1815, the development of iron ore reserves received great encouragement in the 1830's with announcement of the discovery of a hill believed to be solid iron ore at Iron Mountain, St. Francois County, and a similar deposit at Pilot Knob, Iron County. Mining was begun at these locations and a railroad was built connecting with St. Louis. The new deposits were expected by some to make the region the iron mining center of the United States. But, hopes were relatively short-lived. Richer deposits were discovered in the Lake States, and the Missouri ore bodies proved to be much less extensive than supposed.

Recently, however, the virtual exhaustion of the best ores of the famed Mesabi Range of Minnesota, coupled with the growth of the steel industry and development of new up-grading methods, have roused new interest in Missouri ores. It has become profitable to develop reserves of low-grade ores. The mine at Iron Mountain has operated steadily since World War II with output presently over 200,000 tons annually. Moreover, some better-grade ores have been found. Ore discovered near Sullivan, in Franklin and Washington Counties, lying more than a thousand feet below the surface, is said to test over 60 per cent iron content. It is possible that such magnetic ore is located extensively in the underlying igneous rock, illustrated in figure 2. Present plans call for production of some two million tons of ore within five years and employment of as many as 800 men.

In addition to the above development other plans are said to have been made for exploratory activity in Iron, Crawford and Dent counties.

*Cobalt mining is particularly dependent upon advanced methods.*

Cobalt is another mineral which, like iron, has benefited from improvement in techniques as well as an increase in market demand. This mineral has become an important domestic resource, used principally as an alloy in metals to be subjected to intense heat, such as used in jet aircraft engines, and in permanent-magnet alloys like those utilized in control devices and communication equipment. The sulfide ores bearing cobalt, nickel, copper and lead found at Fredericktown contain only about 0.2 per cent cobalt and are so complex that it has been very difficult to separate the mineral from the ore.

Although the mining of these ores was begun in the 1840's, no large-scale development was attempted until 1900. This venture and another started in 1917, lasted only a few years and were not profitable. Re-activated again in World War II, the mine, principally a lead producer with copper, nickel and cobalt extracted in lesser quantities, is now one of three cobalt-producing operations in the United States (Cornwall, Pennsylvania, and Blackbird, Idaho, are the others).

While the region's output of cobalt is probably less than that of the Idaho operation and all three domestic sources provide only a small part of total United States' requirements (less than 10 per cent through 1953), the strategic importance of cobalt and nickel is so great that a refinery costing several million dollars was completed at Fredericktown in 1954 and 300 persons are currently engaged in the mining and refining operations there.

#### *Notwithstanding the growth in manufacturing . . .*

Manufacturing skills as well as mining techniques were developed in the region with the establishment of railroads and, in the late 1920's, a hard-surface highway network. One of the first large plants to be built outside those directly dependent upon mineral resources was a railroad car repair shop located at De Soto. Today about 700 persons are employed there. Shoe and apparel manufacturers, finding the region convenient to St. Louis and with an available supply of labor, set up factories in many of the communities. Smaller establishments included a large number of lumber and woodworking, food processing and printing and publishing plants. The distribution of manufacturing activity in 1954 is shown by Table 1.

TABLE 1  
NUMBER OF MANUFACTURING ESTABLISHMENTS IN THE  
SOUTHEAST MISSOURI MINING REGION BY INDUSTRY GROUP  
1954

	Number of Employees		
	1-19	20-99	100 and Over
Food and Kindred Products.....	21	3	
Textile Mill Products.....		1	
Apparel and Related Products.....		5	1
Lumber and Wood Products.....	42	2	
Printing and Publishing.....	17	2	
Chemicals and Products.....	2		
Leather and Its Products.....		2	6
Stone, Clay and Glass.....	11	1	3
Primary Metals.....	1		1
Fabricated Metal Products.....	4	1	
Machinery, except Electrical.....	6	1	
Electrical Machinery.....		1	
Transportation Equipment.....	2		
Instruments and Related Products.....	2		
Miscellaneous Manufactures.....	4	2	
Total.....	112	21	11

Source: *Census of Manufactures*

There has recently been a growth of new industry, particularly in the northern part of the region. In the past fifteen months three chemical companies have established new plants in Jefferson County. Largest, with some 140 employees, is the Mississippi River Fuel Corporation whose ammonia plant located near Crystal City produces up to 330 tons of fertilizer a day. Near Hematite, Mallinckrodt Chemical Company operates the world's only plant producing enriched uranium for generating commercial electric power from atomic energy. It employs 25 persons. The Dow Chemical Company recently opened a plant near Pevely for the manufacture of plastic foam. Meanwhile, the established plants in Jefferson County—the glass plant noted previously, shops of the Missouri Pacific Railroad at De Soto, the St. Joseph Lead Company smelter at Herculaneum, and a cement and a wire manufacturing establishment—continue to afford industrial income.

#### *. . . and continued reliance on agriculture throughout all six counties, . . .*

Along with mining and manufacturing, agriculture is important in the six-county area, providing 18 per cent of total employment in 1950. In fact, more people are engaged in agriculture than in mining. These agricultural activities, however, contribute only a small share of the region's income. Census data show that about 65 per cent of the region is in woodland and 20 per cent in cropland. Some 10 per cent is in open pasture and in addition nearly one-fourth of the woodland is being pastured.

A few relatively fertile valleys produce the bulk of the farm income. Notable among them are the Farmington-Libertyville Valley, the Belleview Valley centered on Caledonia, and the small Arcadia Valley. Also, the "Big Field," the stretch of some 2,500 acres of river bottomland adjacent to Ste. Genevieve, noted earlier, is an important crop producer. There are also scattered smaller valleys throughout the hilly sections, devoted chiefly to livestock and dairy farming.

The composition of the agricultural economy has changed but little in the past decade. This is principally a meat-producing region, with livestock products other than dairy accounting for over one-half of the value of farm products sold. About one-sixth of the agricultural cash income comes from sales of poultry and poultry products and another sixth from dairy products. Cash crops contribute only about one-eighth of the region's farm income, reflecting the fact that crops are used largely as feed.

TABLE 2  
FARM PRODUCTS SOLD IN THE SOUTHEAST  
MISSOURI MINING REGION  
Percentage Distribution by Product  
1945 and 1954

	1945	1954
Dairy Products.....	16.9%	15.6%
Livestock Products other than Dairy and Poultry.....	53.8	57.0
Poultry and Poultry Products.....	16.3	13.8
Crops.....	11.8	12.8
Forest Products.....	1.2	0.8
All Farm Products.....	100.0%	100.0%

Source: *Census of Agriculture*

The proportion of agricultural income derived from forest products is not large, but the total regional income generated by harvesting and processing timber is of considerable significance. As noted, there are more lumber and wood products plants in the region than any other single industry group, though they are generally quite small. Future income from timber may well expand as better forestry practices are generally adopted. For example, in the Fredericktown Ranger District some 20,000 of 75,000 acres are now growing in pine and this type of pine regeneration is common in the area where fire protection has been adequate and seedling trees were available.

*... mining activity—sustained by sizable reserves of ore—will remain an important source of income in the region.*

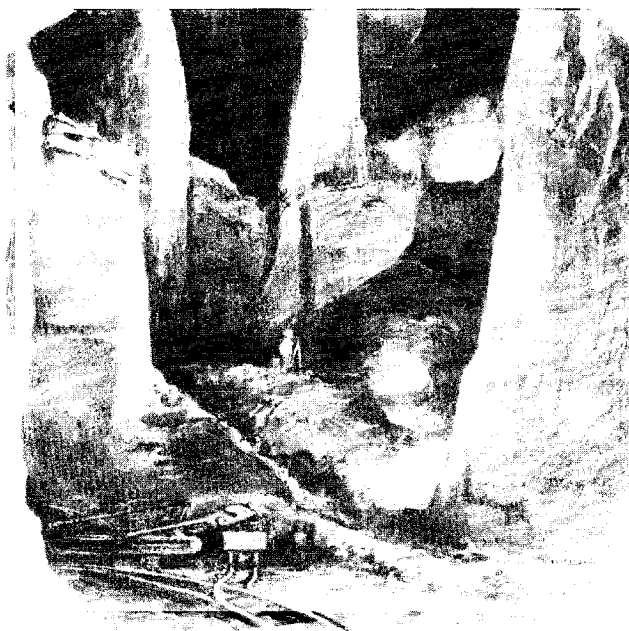
Despite the variety of other activities in the region, mining still remains a mainstay of income. It is estimated that considerably over one-half of those engaged in manufacturing and mining in the region today are directly dependent upon mineral resources. Employment in mining and associated industries is estimated to be about 9,000 (Table 3).

TABLE 3  
MINING AND ASSOCIATED EMPLOYMENT IN THE  
SOUTHEAST MISSOURI MINING REGION<sup>1</sup>  
1957

	Number of Employees
Barite Mining.....	700
Granite Quarrying.....	25
Iron Mining.....	200
Lead Mining <sup>2</sup> .....	3,000
Lead Smelting.....	450
Lead-Copper-Cobalt-Nickel Mining and Refining.....	300
Limestone Quarrying and Preparation.....	1,200
Sand and Gravel Quarrying.....	25
Silica Sand Quarrying and Glass Manufacture.....	3,100
Total.....	9,000

<sup>1</sup> Estimated by the Federal Reserve Bank of St. Louis.

<sup>2</sup> Includes some zinc and silver.



*Underground View in Lead Mine.*

The population of many of the smaller communities, such as Mineral Point, is almost entirely engaged in mining. In Bonne Terre and Flat River, two of the larger mining centers of the region, 31 per cent of the persons employed, according to the most recent Census data, are engaged in mining; 14 per cent at Fredericktown. Mining employment in the six-county region amounted to 43 per cent of total mining employment in Missouri in 1950 and the value of mineral production by mines and quarries in the Southeast Missouri Mining Region amounted to over \$50 million in 1956 according to the Missouri Division of Mine Inspection.

On the basis of present prices and technology there are sizable reserves of certain minerals in Southeast Missouri. Limestone reserves, for example, may be placed in the hundreds-of-years category. The glass company at Crystal City controls an estimated seventy-year supply of silica sand, and much more is available. Known barite reserves will last another thirty to forty years at the present rate of use. Iron ore reserves might prove to be much more extensive than presently discovered, according to some professional opinion. While there is little prospect of finding any additional high-grade lead deposits in the old Lead Belt, substantial tonnages have been discovered in new locations nearby.

Such reserves would seem to assure the continued importance of mining to the economy of the region for many years to come.

HARRY B. KIRCHER



# Survey

## OF CURRENT CONDITIONS

*Released for publication August 1*

**E**CONOMIC TRENDS during July were mixed in the Eighth Federal Reserve District but on balance business activity showed very little change from the pace established in the first half of the year. Industrial production slowed somewhat and construction was hindered by shortages of cement supplies in some areas. Insured unemployment declined in the four weeks ended July 20 in Louisville, Memphis and St. Louis but increased in Evansville as a result of seasonal layoffs from refrigerator plants. Department store sales in the first three weeks of July declined less than the usual amount and were slightly larger than a year earlier, whereas for the first six months of the year they lagged somewhat. Total loans rose about the usual amount in the five weeks ended July 24 following a sharp expansion in June. Crop prospects improved as a result of better weather conditions.

### *Industry*

Output from the district's factories and mines declined in July, reflecting a number of factors. Plants closed in order to give annual vacations to employees in July. Work stoppages slowed output in a few plants, and lessened demands caused curtailment of production in some lines.

Output of steel in the St. Louis area, however, increased in July from the reduced rates in June when weather hindered operations, although the July tonnage poured was less than a year earlier. Auto production was at about the same rate in July as June and somewhat greater than a year earlier. Livestock slaughter in the St. Louis area was lower in July than in June but also above last year's activity. Lumber output continued to weaken and coal and crude oil production in the district also declined from June to July and were less than July 1956.

Manufacturing employment held steady from May to June in Little Rock, Louisville and Memphis, declined in Evansville but expanded in St. Louis. In Little Rock recalls in the apparel industry balanced seasonal drops in chemicals while layoffs in farm equipment cancelled small gains in fabricated metals at Memphis. At Louisville temporary layoffs in metal-

working industries and chemicals were partially balanced by gains in food processing and cigarette production. The slight decline in June manufacturing employment at Evansville was largely in refrigerator and transportation equipment plants. The expansion in St. Louis area manufacturing employment from May to June reflected major increases in primary and fabricated metals, transportation equipment and food products industries.

In the first half year, manufacturing employment averaged about 7 and 5 per cent less respectively in Little Rock and Louisville but climbed to a level 6 per cent higher than last year in Evansville. Memphis and St. Louis showed little change from a year ago.

Contributing to the increased number of factory workers this year in Evansville were gains in the motor vehicle and refrigerator industries. The major job losses from a year ago in Little Rock were in the lumber and wood products, stone, clay and glass, furniture, metal products and chemicals industries. At Louisville the number of manufacturing workers averaged less this year in all major industry groups except stone, clay and glass, printing and publishing, nonelectrical machinery and transportation equipment. Employment in the latter increased over last year while the other three averaged about the same. Although employment levels in manufacturing averaged about the same this year as last in Memphis and St. Louis, there were some significant gains and losses among various industries. In Memphis employment this year was down substantially in lumber and wood products while the apparel industry showed some gains over last year. In St. Louis McDonnell Aircraft's employment increase of about 10,000 over last year was the big factor offsetting shrinkage from a year ago in ordnance, fabricated and primary metals, electrical machinery, textiles, apparel, food and leather products. In July McDonnell received an order to slow output of military aircraft but no reduction in employment was planned.

### *Construction*

Construction activity in the Eighth Federal Reserve District so far this year has presented a mixed pattern.

Total contracts awarded in the first six months of the year were 4 per cent greater than in the comparable period last year. The increase was largely due to higher construction costs, which averaged about 4 per cent above a year ago. However, in July construction activity slowed in some areas because of shortages of cement which resulted from work stoppages in a few cement mills. And judging from employment data, construction activity in the St. Louis, Memphis and Little Rock areas was less than a year ago, but about the same in the Louisville and Evansville areas.

District residential construction contracts awarded in the first half of 1957 were 12 per cent larger than a year ago, in contrast to the national trend which was lower than last year. The increase resulted from substantial contracts awarded for publicly-owned residential construction, such as dormitories, barracks and other government-owned housing. In fact, in the first six months of the year about one-fifth of the value of district residential contracts awarded was for government-owned housing. In areas where public housing has not been a large factor, residential construction has followed the national pattern and, in the first six months, was less than last year. While the number of private dwelling units started so far this year has dropped sharply from last year, the average house size has continued to increase and the average cost per square foot has also risen.

#### *Labor Markets*

Labor market conditions in the district's major metropolitan areas showed primarily seasonal changes from May to June. Total nonagricultural employment declined slightly from May to June in the Louisville, Memphis, Little Rock and Evansville metropolitan areas but expanded in St. Louis, following the general pattern of recent years. However, in the past year, district employment has not kept pace with the national increase. During the first half of 1957, the average level of nonagricultural employment in the district's five major labor market areas did not change much from the first half of 1956. The average was 3 per cent higher this year in Evansville, 2 per cent under last year in Little Rock and Louisville and virtually the same in Memphis and St. Louis. In the nation, nonagricultural employment averaged 2 per cent higher than in 1956.

Unemployment rose in all five areas from May to June as usual because of the addition of recent graduates to the labor force. From June 22 to July 20 claims for unemployment compensation continued to increase at Evansville but decreased at Louisville, Memphis and St. Louis. Claims were greater than a year ago by 3 per cent at Evansville, 8 per cent at

Memphis and 22 per cent at Louisville but were down 4 per cent in the St. Louis area.

#### *Trade*

Department store sales in the district in the first three weeks of July were slightly larger than in the comparable period a year earlier. The improvement was in contrast to performance over the first half of the year during which sales averaged 1 per cent less than in the same period of 1956. But so far this year district stores have not kept pace with the nation, where sales averaged 2 per cent higher than in the same period a year ago. The relative lag was roughly comparable to that in employment. With department store prices about 2 per cent higher than a year ago, the physical volume of goods purchased in district stores also declined.

#### *Banking*

Loan expansion at Eighth District weekly reporting banks was about seasonal during the five weeks ended July 24. Total loans rose \$19 million (or 1 per cent) as net additions by businesses and farmers were only partially offset by small reductions in outstanding indebtedness in the other major loan categories. Loans to manufacturers of metals and metal products, public utilities and sales finance companies increased, either more than usual or in contrast to declines in the same weeks in 1952-56. On the other hand, advances to processors of agricultural products were smaller than the average increase in the like weeks of recent years, perhaps because of delayed and smaller harvests this year. Manufacturers of petroleum, coal, chemicals and rubber products, retail trade concerns and contractors reduced their indebtedness in the five weeks under review. Loans outstanding to textile, apparel and leather products manufacturers, wholesalers and commodity dealers increased about the usual amount.

Following the Treasury financing early in July bank investment holdings increased sharply but were progressively reduced in subsequent weeks. On balance, the weekly reporting district banks reduced their investment holdings \$20 million, in the five weeks.

#### *Agriculture*

Somewhat better weather conditions during July than in June favored district farming operations and improved crop prospects. Hot weather and generally less rainfall permitted late planting of corn and soybeans. Early planted corn and soybean crops were growing well, but because some plantings had been delayed, progress varied considerably. Hot, sunny weather over the Cotton Belt gave cotton farmers an opportunity to perform much needed cultivation and increased the effectiveness of insect control measures. The crop was fruiting well and progressing

satisfactorily. According to the *Journal of Commerce*, cotton production in district states in 1957 is expected to fall 26 per cent from 1956 volume, compared to a 15 per cent drop in the nation. The better weather in July permitted normal hay harvesting; however, pasture conditions deteriorated in the southern part of the district.

Prices of most district farm commodities increased in the four weeks ending July 26. Nationally, prices received by farmers increased approximately one per cent during the month ending July 15. Prices paid decreased slightly, and the parity ratio (prices received to prices paid) increased to 84 from 82 at mid-June.

District cash farm income for the first five months

of 1957 was about 4 per cent below that of last year, as calculated from revised 1956 estimates. Cash income in district portions of Illinois, Indiana, Kentucky, and Missouri was ahead of last year. However, substantial reductions in Mississippi, Arkansas, and Tennessee more than offset the above gains. For the nation, cash farm income was up 2 per cent.

Nationally, farmers' realized net income rose from \$12 billion seasonally adjusted during the first quarter of 1957 to \$12.2 billion during the second quarter. Realized net to farm operators was \$12.1 billion last year.

United States Department of Agriculture estimates of acreage for major district crops are given in the table below.

ACREAGE HARVESTED IN 1956 AND FOR HARVEST IN 1957  
(Thousands of Acres)

	Cotton		Corn		Winter Wheat		Oats		All Hay		Tobacco		Soybeans	
	1956	1957	1956	1957	1956	1957	1956	1957	1956	1957	1956	1957	1956	1957
Arkansas.....	1,405	1,165	670	556	96	158	442	411	863	835	—	—	1,509	1,545
Illinois.....	—	—	8,804	8,276	1,608	1,721	3,041	2,767	2,493	2,461	—	—	4,735	5,116
Indiana.....	—	—	4,783	4,353	1,186	1,222	1,250	1,100	1,551	1,508	7	7	2,172	2,345
Kentucky.....	—	—	1,836	1,561	207	199	72	60	1,653	1,607	242	232	133	137
Mississippi.....	1,641	1,400	1,566	1,488	18	162	341	361	742	741	—	—	732	681
Missouri.....	373	315	3,946	3,433	1,660	1,693	1,359	1,210	2,710	2,835	3	3	1,956	1,760
Tennessee.....	558	490	1,716	1,493	205	195	248	228	1,516	1,501	84	79	240	200
Total Eighth District States.....	3,977	3,370	23,321	21,160	4,980	5,350	6,753	6,137	11,528	11,488	336	321	11,477	11,784
Total United States.....	16,833	14,224	75,950	72,289	35,637	31,075	33,639	35,774	73,627	73,499	1,365	1,128	20,926	21,650



# The District Record

## Industry

## VARIOUS INDICATORS OF INDUSTRIAL ACTIVITY

Steel Ingot Rate, St. Louis area (Operating rate, per cent of capacity)	71	June 1957	June 1957* compared with May 1957	June 1956
Coal Production Index—8th Dist. (Seasonally adjusted, 1947-49=100)	97.5 p		+11	-25
Crude Oil Production—8th Dist. (Daily average in thousands of bbls.)	354.4		-10	-7
Freight Interchanges at RR's—St. Louis (Thousands of cars—25 railroads—Terminal R. R. Assn.)	96.9		-8	-6
Livestock Slaughter—St. Louis area. (Thousands of head—weekly average)	102.1		-11	-0
Lumber Production—S. Pine (Average weekly production—thousands of bd. ft.)	208.3		+2	-3
Lumber Production—S. Hardwoods (Operating rate, per cent of capacity)	72		-0	-23

\* 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.

## Banking

### BANK DEBITS<sup>1</sup>

	June 1957 (In millions)	June 1957 compared with May 1957	June 1956
Six Largest Centers:			
East St. Louis—National Stock Yards, Ill.	\$ 139.1	-9 %	+5 %
Evansville, Ind.	180.5	-5	+3
Little Rock, Ark.	202.9	-3	+7
Louisville, Ky.	843.3	-4	-4
Memphis, Tenn.	713.3	-8	+7
St. Louis, Mo.	2,321.0	-5	-1
Total—Six Largest Centers	\$4,400.1	-6 %	-0 %
Other Reporting Centers:			
Alton, Ill.	\$ 39.8	-7 %	-12 %
Cape Girardeau, Mo.	16.5	-1	-4
El Dorado, Ark.	31.6	-1	-0
Fort Smith, Ark.	57.0	+2	-0
Greenville, Miss.	25.6	-5	-5
Hannibal, Mo.	11.6	+5	+6
Helena, Ark.	9.0	+4	+5
Jackson, Tenn.	22.8	-12	-6
Jefferson City, Mo.	64.4	-23	-6
Owensboro, Ky.	50.7	+2	+6
Paducah, Ky.	31.2	-0	+8
Pine Bluff, Ark.	41.3	-0	+15
Quincy, Ill.	42.5	-2	+5
Sedalia, Mo.	15.6	-5	-9
Springfield, Mo.	88.0	-4	-2
Texarkana, Ark.	21.1	+3	-9
Total—Other Centers	\$ 568.7	-5 %	-2 %
Total—22 Centers	\$4,968.8	-6 %	-0 %

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

	1957	1956
June	162.6	162.6
May	179.3	162.6

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

## CASH FARM INCOME

	May 1957	May 1956	Percentage Change from May '56	Jan. thru May 1957 compared with 1956
(In thousands of dollars)				
Arkansas	\$ 26,416		-14 %	+11 %
Illinois	151,472	+4	+11	+28
Indiana	72,768	-0	+6	+3
Kentucky	29,305	+3	+7	+10
Mississippi	22,602	+1	-24	+6
Missouri	74,762	+4	+4	+19
Tennessee	29,847	-4	-6	+14
7 States	407,172	+1	+2	+15
8th District <sup>1</sup>	167,998	-1	-4	+13

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

<sup>1</sup> Estimates for Eighth District revised based on 1954 Census of Agriculture.

<sup>2</sup> January thru May 1956 and 1957 revised.

## EIGHTH DISTRICT WEEKLY REPORTING MEMBER BANKS

(In Millions of Dollars)

Assets	July 24, 1957	June 19, 1957	Change from June 19, 1957
Loans <sup>1</sup>	\$1,622	\$1,19	+19
Business and Agricultural	847	+20	
Security	52	-1	
Real Estate	279	-0	
Other (largely consumer)	470	-0	
U.S. Gov't. Securities	839	-15	
Other Securities	224	-5	
Loans to Banks	17	-10	
Cash Assets	867	-67	
Other Assets	41	-0	
Total Assets	\$3,610	\$-78	

Liabilities and Capital	July 24, 1957	June 19, 1957	Change from June 19, 1957
Demand Deposits of Banks	\$ 656	\$-3	
Other Demand Deposits	2,005	-63	
Time Deposits	600	-0	
Borrowings and Other Liab.	59	-13	
Total Capital Accounts	290	+1	
Total Liab. and Capital	\$3,610	\$-78	

<sup>1</sup> Loans are adjusted to exclude loans to banks; the total is reported net; breakdowns are reported gross.

<sup>2</sup> Changes in business loans by industry classification from a sample of banks holding roughly 90% of the total commercial and industrial loans outstanding at Eighth District weekly reporting member banks.

## CONSTRUCTION CONTRACTS AWARDED IN EIGHTH FEDERAL RESERVE DISTRICT \*

(Value of contracts in thousands of dollars)

	May 1957	April 1957	May 1956
Total	\$156,359	\$106,262	\$124,663
Residential	64,841	47,530	49,838
Nonresidential	49,984	36,589	46,938
Public Works and Utilities	41,734	22,143	27,887

\* Based upon reports by F. W. Dodge Corporation.

## Principal Changes in Commercial and Industrial Loans<sup>2</sup> Net Change During 5 Weeks Ended 7-24-57

Business of Borrower	Net Change During 5 Weeks Ended 7-24-57
Manufacturing and Mining:	
Food, liquor and tobacco	\$+6
Textiles, apparel and leather	+5
Metals and metal products	+2
Petroleum, coal, chemicals and rubber	-2
Other	-1
Trade Concerns:	
Wholesale	+3
Retail	-5
Commodity dealers	+5
Sales finance companies	+4
Public Utilities (including transportation)	+2
Construction	+2
All Other	+2
Total	\$+19

## Trade

### DEPARTMENT STORES

Percentage of Accounts and Notes Receivable Outstanding June 1, '57, collected during May.

	June, 1957 compared with May, '57	June, '56	6 mo. '57 to same period '56	Instal. Accounts	Excl. Installment Accounts
8th F.R. District Total	-11 %	-3 %	-1 %	16 %	49 %
Fort Smith Area, Ark. <sup>1</sup>	-12	-3	-3	16	37
Little Rock Area, Ark.	-24	-4	-3	12	41
Quincy, Ill.	-5	-5	-6		
Evansville Area, Ind.	-11	-3	-0		
Louisville Area, Ky., Ind.	-11	-6	-2	19	48
Louisville (City)	-11	-10	-7		
Paducah, Ky. <sup>1</sup>	-11	-4	+5		
St. Louis Area, Mo., Ill.	-7	-2	-0	16	58
St. Louis (City)	-9	-7	-4		
Springfield Area, Mo.	-14	-3	+4		
Memphis Area, Tenn.	-19	-5	-1	16	36
All Other Cities <sup>2</sup>	-7	-7	-2		

<sup>1</sup> 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.

<sup>2</sup> 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 June, 1957, were 1 per cent higher than on the corresponding date a year ago.

### INDEXES OF SALES AND STOCKS—8TH DISTRICT

	June 1957	May 1957	Apr. 1957	June 1956
Sales (daily average), unadjusted <sup>3</sup>	116	127	123	117
Sales (daily average), seasonally adjusted <sup>3</sup>	119	127	125	119
Stocks, unadjusted <sup>4</sup>	n.a.	138	143	127
Stocks, seasonally adjusted <sup>4</sup>	n.a.	138	136	138

<sup>3</sup> Daily average 1947-49=100

<sup>4</sup> End of Month average 1947-49=100

n.a. Not available.

Trading days: June, 1957—25; May, 1957—26; June, 1956—26.