

MONTHLY

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FINANCE • INDUSTRY • AGRICULTURE • TRADE

FOURTH FEDERAL RESERVE DISTRICT

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Federal Reserve Bank of Cleveland

Cleveland 1, Ohio

Construction Activity in 1952

Fourth District

AFTER a slow start during the initial months of the year, construction contracts in the District were awarded at a record rate during the peak summer season and at near-record levels for the balance of the year. Although the 1952 dollar total was slightly ahead of the previous 1951 record, because of rising building costs, physical volume declined for the second straight year. Nevertheless, 1952 was a very good year, particularly for home builders, while the number of large nonresidential projects now getting under way assures continued high construction activity in the months ahead.

Construction costs advanced 4 percent during the year largely due to higher wage rates. Average hourly earnings in the contract construction trades rose slightly more than 4 percent while building material prices dropped about 1 percent at the wholesale level.

The drop in physical volume in the District was accompanied by slightly lower employment in contract construction. In Ohio, during the first ten months of the year, contractors employed 5 percent fewer workers than in the comparable 1951 period. Total payrolls, however, were about the same as a year ago, due to the increase in wage rates.

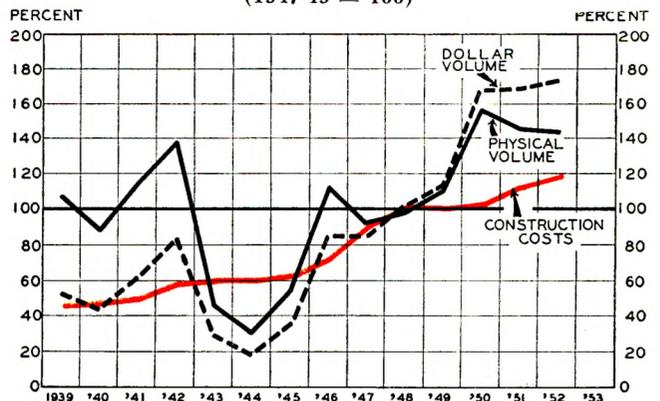
Homebuilding Near Peak Levels

With respect to residential construction alone, the dollar volume of contracts let in the Fourth District during the past year was, because of higher building costs, 11 percent above the previous record set in 1950. Physical volume, however,

did not quite reach 1950 levels although it did exceed 1951. As measured by floor area, 1952 housing volume in the District fell 4 percent short of the 1950 peak. In terms of the number of dwelling units contained in contract awards, the decline was 7 percent.

The continued rise in the popularity of the ram-

CONSTRUCTION CONTRACT AWARD VOLUME IN THE FOURTH DISTRICT AND CONSTRUCTION COSTS IN THE UNITED STATES, 1939-1952 (1947-49 = 100)



. . . the physical volume of construction activity in the Fourth District declined for the second straight year. The rise in dollar volume was entirely a reflection of higher costs.

NOTE: 1952 construction cost figures partially estimated.

Source: Department of Commerce and F. W. Dodge Corporation.

bling ranch-type or one-floor-plan house as well as the trend toward three bedrooms instead of the two-bedroom unit which was so prevalent in the late 1940's, was clearly reflected in last year's contract awards.

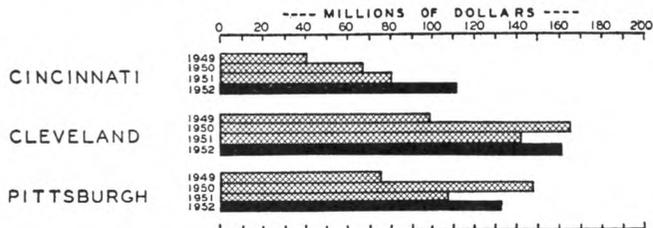
The average single-family home built for sale in the District in 1952 had about 1,300 square feet of floor area, or 6 percent more than in the previous year, and 13 percent more space than in 1949 when the new for-sale unit had shrunk to its smallest post-war size. The 1952 for-sale house was almost identical in size with its 1939 counterpart but the area was typically contained on one floor instead of two.

The trend toward the larger rambling-type house has been accompanied by higher construction costs in terms of foundation, roof, and heating plant expense per unit. These factors plus the continued rise in wage rates raised per-square-foot costs to the highest level on record last year, or 3 percent above 1951.

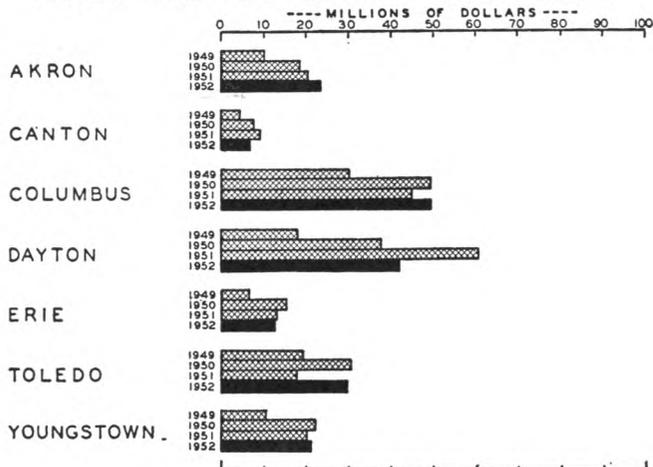
Total residential building activity during the past

RESIDENTIAL CONTRACT AWARDS Ten Fourth District Metropolitan Areas

THREE LARGER METROPOLITAN AREAS



SEVEN SMALLER METROPOLITAN AREAS



... Akron, Cincinnati, and Columbus were the only three of the District's ten major metropolitan areas to have a new record dollar volume of residential contract awards in 1952.

Source: F. W. Dodge Corporation.

year was sustained by the sharp increase in the volume of contracts awarded by speculative builders of for-sale one-family dwelling units. In this type of building activity, dollar volume jumped 22 percent ahead of 1951 to set another new record. Physical volume, as measured by floor area, also increased sharply over last year and exceeded the 1950 volume record by 9 percent. Part of this gain was due to the larger size home built in 1952, since each unit (on the average) has had the equivalent of an 11- by 12-foot room added to its floor area since 1950.

Contracts awarded for one-family dwellings for owner-occupancy increased slightly in dollar value from 1951 but failed by 11 percent to match the 1950 record for this class of building. Physical volume, however, dropped for the second successive year and was accompanied by a slight shrinkage in the average size of the dwelling unit.

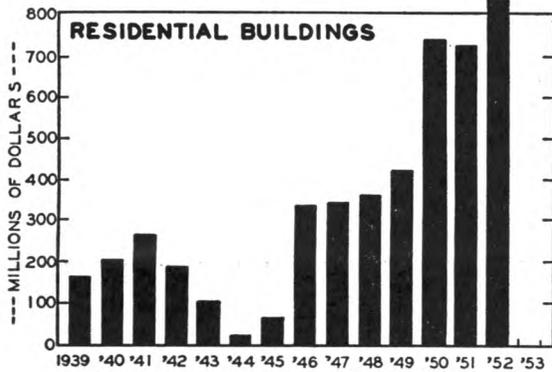
Builders of multi-family units (apartments, hotels, two-family houses, and other shelter) also established a new record in the value of awards with an 11 percent increase over last year. Floor area increased by a somewhat smaller amount and just about matched the 1950 record.

The past year's upsurge of homebuilding took place largely outside the District's ten largest metropolitan areas. As recorded by F. W. Dodge Corporation, only three metropolitan areas reported new highs in dollar valuation: Cincinnati and Akron awards topped previous 1951 peaks with gains of 37 percent and 14 percent, respectively, and residential awards in Columbus inched fractionally ahead of the former 1950 high. In Canton and Dayton dollar totals fell short of 1951 peaks while Erie's volume declined for the second straight year. The 1952 residential contract award volume in Cleveland, Pittsburgh, Toledo, and Youngstown was above 1951 but below 1950's record dollar total.

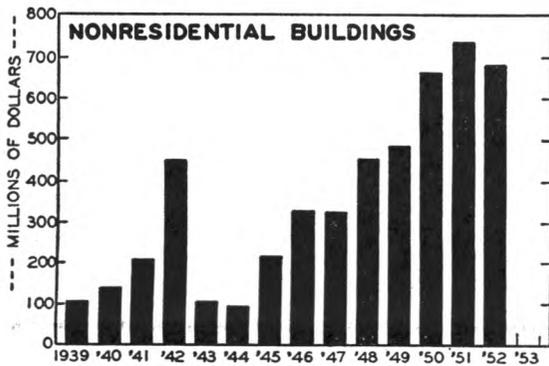
Fourth District residential building activity made a better showing than that reported by Dodge for the combined 37 eastern states covered by that organization. As a consequence, the proportion of contracts awarded in the District rose to 12.4 percent of the 37-state dollar volume as compared with 11.7 percent in 1951. In the 1946-50 period, the District proportion never exceeded 11 percent.

Nonresidential Building Drops Nonresidential construction activity in the Fourth District last year dropped 9 percent below peak 1951 levels, chiefly because of a sharp reduction in manufacturing building contract awards. The decline was also due in large part to controls on the use of metallic building materials in commercial and other types of building considered nonessential to the defense effort. An exception to the general rule were school building contract awards which reached a

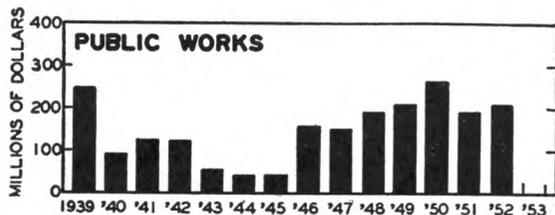
CONSTRUCTION CONTRACT AWARDS
1939-1952
Fourth District



... the volume of residential building awards reached a new dollar peak in the District during 1952. Most of the increased activity took place in one-family homes for sale or rent although awards for multi-family units also reached a new high.

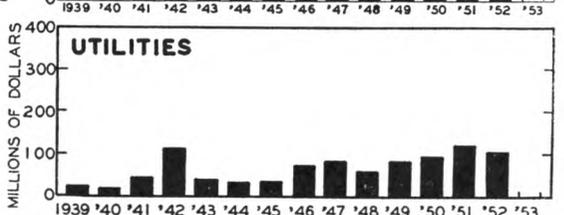
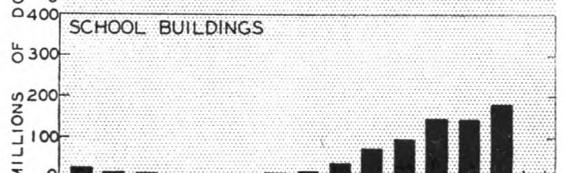
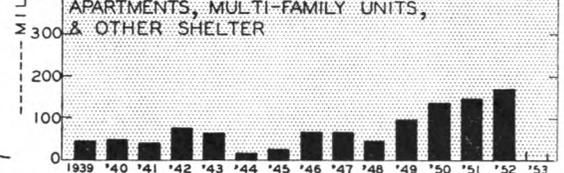
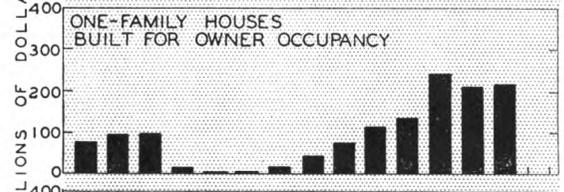
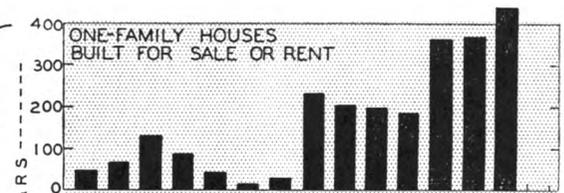


... nonresidential building award volume fell sharply below 1952, chiefly due to the cutback in manufacturing building awards. School buildings were the only major group to experience larger dollar volume.



... awards for public works projects gained slightly over 1951 but fell short of the 1950 high.

Source: F. W. Dodge Corporation.



... public utilities put a smaller volume of work under contract during 1952.

new high in 1952. All other types of nonresidential building were below records established in previous years. Nevertheless, 1952 went on record as the second best year, dollarwise, for nonresidential building in the Fourth District.

The drop in the dollar volume of awards let for manufacturing buildings was much more severe in this District than that experienced nationally. In the District, the decline was 25 percent from the 1951 peak while in the 37 eastern states it was only 11 percent. The concentration of basic industry essential to the defense program within the District accounts for much of this decline.

The rapid expansion of basic industry since mid-1950 — particularly iron and steel — came early in the defense program. This development was stimulated and assisted by rapid amortization rights on new plant and equipment granted by the National Production Authority. The major part of this expansion passed through the contract award stage in 1951. In fact, over half of the expansion covered by certificates of necessity is already in place and the program will be virtually completed by the end of 1954. Much of the work represented by these certificates remains to be done but its impact has already been reflected in the contract award figures. However, large-scale letting of contracts will get under way this year for the \$1,219,000,000 Portsmouth atomic energy project. While only a fraction, perhaps a third, of this total figure will be for construction and new buildings (the balance is for machinery and equipment), this single project will very likely push 1953's manufacturing building total to a new record in this District.

School building awards moved to a new high in 1952, continuing a nine-year upward trend that was interrupted only in 1951. Presumably school construction will increase further during the forthcoming year. At least the need for additional space will be urgent with the bumper postwar baby crop coming of school age.

After a poor showing in 1952, commercial building may also pick up during 1953. Last year's five-year low in dollar volume was the result of restrictions imposed by material controls throughout the year and, to a lesser extent, to credit controls in effect during the first three quarters. The rapid improvement in the supply of steel and reduced requirements for structural steel in manufacturing buildings prompted NPA to relax controls on the use of structural steel. This became effective January 1, 1953, instead of May 1 as originally planned. Much of the work deferred for nearly two years should now get under way. The relaxation increased substantially the amounts of steel and copper that could be self-authorized for most types of construction and lifted the two-year ban on social and recreational projects.

Heavy Engineering Award Volume Down But Outlook Rosy

Contract awards for heavy engineering projects in the District this past year were about the same as in 1951 but 12 percent under peak 1950 levels. This was contrary to the experience in the 37 states east of the Rockies where both public works and utilities awards climbed to new highs. The 1953 totals, however, may tell a different story in the District. Three developments point to rising activity: the selection of the Gallipolis area as the site of one of the electric generating plants to supply power to the Portsmouth atomic energy plant; the first ground breaking for the Ohio Turnpike; and Ohio's new Water Pollution Control Act.

Ground has already been broken and work has begun on the \$145 million Kyger Creek power plant between Cheshire and Gallipolis, Ohio. Five turbo-generating units of 200,000 kilowatts each or a total capacity of a million kilowatts will be installed at this location. The power generated will be delivered to the A-plant over two double-circuit, 330,000-volt transmission lines. Along with its 1,200,000 kilowatt sister plant to be built at Madison, Indiana, it will supply the electric energy needs of the A-plant.

The ground breaking of the Ohio Turnpike in October, 1952, signified the settlement of legal obstacles and the actual start of the long contemplated \$283 million project. The entire project will be under contract by the end of next month and is to be completed in June of 1955. The cost of this project alone exceeds the \$264 million record for all public works projects in the District set in 1950.

The Water Pollution Control Act of Ohio, enacted in 1951, became fully operative last September. It is estimated that Ohio's cities and industries will have to spend \$500 million on construction in order to bring their liquid waste disposal facilities up to statutory requirements.

Added together, these three programs total nearly a billion dollars' worth of construction, most of which will be put in place in the next two or three years. This would about equal half a year's total contract award volume in the District at 1950-52 rates.

ANNOUNCEMENT

The 1952 Annual Report of this bank is now available. Copies may be obtained by writing to the Research Department.

In addition to financial statements, the 36-page report contains an economic review of 1952.

Who Owns the Farmland?

EXPERIENCE, observation, and universal problems in land reform substantiate the belief that a high percentage of ownership of farms by the men who actually cultivate them is the best assurance of economic and social progress.

As recently as the turn of the century, it appeared that this objective might never be attained. Tenancy had been increasing faster than ownership by farmers for at least two decades before 1900, and it continued to rise. By 1930, only 57 percent of the farms were owned by active farmers.

Some time during the long depression of the 1930's, however, the trend was reversed. The ratio of farm-operator ownership improved very sharply during and since World War II with the result that today agriculture may claim the most favorable tenure situation in 70 years. All but about 1/4 of the nation's farms are operated by their owners.

Ownership by Acreage and Numbers

Actual numbers of farms owned by operators have not changed greatly since the 1930's, but instead those operated by tenants have shown an extremely sharp decline. With two exceptions, farmer-owned units are now virtually the same in number as in each of the seven agricultural census counts made since 1910, whereas tenant oper-

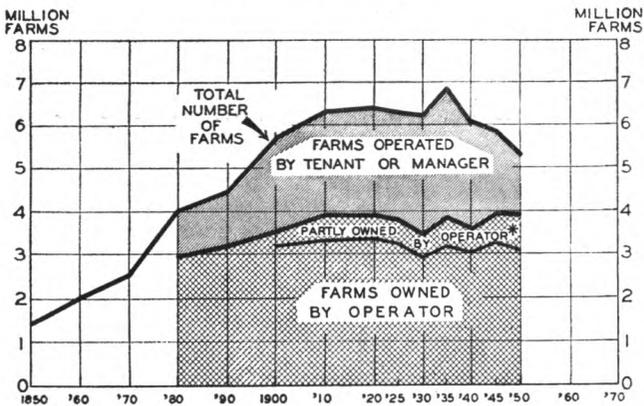
ated farms have been cut in half in the past fifteen years and are the lowest since 1890. This has come about largely through a combination of farms into fewer but larger units accompanied by a considerable decline in the size of the farm population.

The traditional indicator of land tenure is in terms of numbers of individual farm businesses. This does not fully describe the distribution of ownership nor does it completely reflect the significance of recent changes. Although farm operators now own 72 percent of the nation's farms, for example, they own only 56 percent of the farm acreage. But in the early 1930's they owned only 57 percent of the numbers and 50 percent of the acreage.

In terms of change from 1945, a 7 percent increase occurred in actual acreage owned by operators although numbers so owned showed practically no change other than the decline brought about by the Census Bureau's redefinition of a farm. Similarly from 1940, acreage owned by operators increased by 23 percent or over 2 1/2 times the rate of gain in numbers.

Prevailing economic conditions have a bearing upon the acreage desired in individual farms, thus sometimes offsetting changes in numbers. During the decade of the 1940's, for instance, mechanization, labor shortages, a strong demand for farm products, and favorable prices pointed the way to larger farms for greater efficiency and profit. Consequently, the smaller farms dwindled rapidly in number while

NUMBERS OF FARMS BY OWNERSHIP, UNITED STATES**



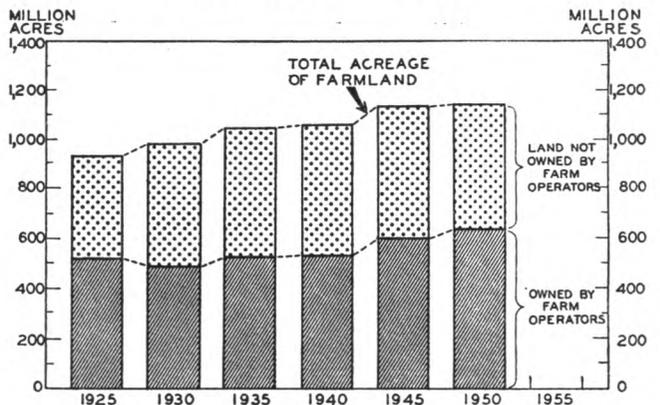
... nearly 4,000,000 farms are owned by operators, but that number has changed very little (net) since 1910. The ratio of the tenant-operated farms, however, is the smallest in more than sixty years.

* Farms are owned by operator but additional land is rented.

** Depicts number of farms only, whereas the accompanying charts show acreage.

Source: Bureau of the Census, U. S. Department of Commerce.

ACREAGE OF FARMLAND BY OWNERSHIP IN THE UNITED STATES



... of the more than 1,150,000,000 acres of farmland in this country, nearly 650,000,000 acres are owned by farm operators—probably the largest on record. The number of acres owned by non-operators is the smallest in two decades.

Source: Bureau of the Census, U. S. Department of Commerce.

those over 180 acres in size gained in number. The average acreage per farm grew to the largest in a century while numbers dropped to the fewest since homesteading was still rampant over five decades ago.

Many of the small farms which have disappeared in the last ten or twelve years were tenant farms which now exist as larger tenant farms. Others were annexed to farms already owned by operators. Still others have been broken up into lots for urban housing. The decline in total numbers would have been even greater were it not for a substantial increase in the number of residential farms of under 10 acres.

Fourth District Situation Nearly every county in the Fourth District has fewer farms now than in 1945. This downtrend in farm numbers has been general in all parts of the nation although somewhat more pronounced in some areas.

Trends in acreage devoted to farming have not been so uniform over the nation, however, nor have the fluctuations in acreage by ownership. The area of farmland within the Fourth District, as an example, has declined by 10 percent since 1935, whereas the national acreage has increased by this amount. The acreage owned by operators gained 4 percent in the District during this period but rose 24 percent nationally. The current situation in the District shows over 75 percent of the farmland acreage to be owned by farm operators in contrast to 56 percent nationally.

Even in the various areas of the Fourth District these changes are not uniform. Farm operators in

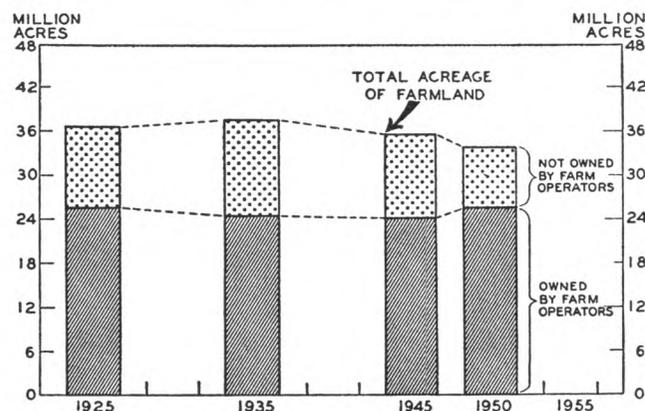
western Pennsylvania, for example, owned a smaller acreage of farmland during 1950 than in 1945 or 1935, whereas such operators owned more in Ohio, eastern Kentucky and the northern tip of West Virginia. Similarly 1950, in comparison with the earlier date of 1925, shows Ohio farmers owning more acreage while in all of the other state areas they own less.

Many of the differences within the District are accounted for by the ownership pattern existing at the time of reference. When most of the land is already owned by operators there is obviously less opportunity for a rapid rate of increase. The proportion of farmland owned by Ohio farmers is not so high today as it was in the District portions of the other states during the 1930 depression.

Farmers do own a larger percentage of the farmland in each of the parts of the District now by comparison with the various other time periods, but it is due more to a decline in the area of farmland and tenancy than to an increase in ownership. In 1950, Ohio farm operators owned 70 percent of the farmland compared with 83 percent in eastern Kentucky, 88 percent in western Pennsylvania and 84 percent in the northern tip of West Virginia.

Quality of land in parts of the District as in other areas of the country have considerable bearing on the ratio of owned to tenant operated land. Corn-belt farms will often support an absentee owner and a tenant, whereas less fertile land may not prove profitable for more than one family with similar or even larger acreage.

ACREAGE OF FARMLAND BY OWNERSHIP
IN THE FOURTH DISTRICT



... acreage of farmland owned by Fourth District farm operators has recently recovered to 1925 levels. Farm acreage owned by persons other than active farmers is the smallest since at least 1925 and accounts for only 24½ percent of the total.

Source: Bureau of the Census, U. S. Department of Commerce.

Some Tenancy Necessary It is not probable nor necessarily desirable that all of the farm acreage in the nation should be continuously owned by farm operators. Tenancy serves many useful purposes, a major one being the "stepping stone" to ownership which it offers a beginner.

Very few young potential farmers can lay their hands on the \$50,000 or more which they may find necessary to become an owner-operator of a well-equipped economic-sized unit. Even to begin as a tenant farmer it is likely that several years of labor as a hired hand or a factory worker may be necessary before enough capital can be accumulated. Not all equipment requirements can be obtained on credit.

Tenure as a tenant in turn serves not only as a period of building up the additional capital for buying land, but it also serves as a minimum-risk proving ground for acquiring the vast amount of experience and knowledge needed by an independent owner-operator. An intermediate step between tenancy and full ownership is frequently the acquisition

of a small farm which is supplemented by renting additional land. The process of passing through a phase of tenancy, commonly known as a step in the "agricultural ladder," serves a vital function of keeping management ability in step with the capital pledged in land and equipment.

Many tenants are reluctant to accept the risk of ownership and never take the final step. Tenants of stable occupancy on well-equipped farms of economic size may actually have a more desirable tenure status than a debt-burdened owner-operator on a small, poorly-equipped unit.

The dangers of tenancy arise when the continuous flow to ownership is blocked for deserving operators by factors beyond their control. Many situations

have contributed occasionally and some even chronically to such a development. A declining price level, insufficient credit, inequitable leasing arrangements, bidding up of land prices by parties not primarily interested in agriculture, and improper inheritance provisions are a few of the major ones.

When ownership of farmland becomes concentrated in the hands of persons other than those engaged in farming, it becomes a matter of national concern. Tenants without hope of elevating themselves to ownership and uncertain of their residence from one year to the next cannot be expected to initiate the sound and permanent farming programs necessary to high productivity and to keep this nation the best fed and best clothed in the world.

The Transistor—a New Detective

by CLYDE WILLIAMS, Director, Battelle Memorial Institute



In the past twelve years, the electronics industry has seen the annual sale of its products soar from \$500 million to an estimated \$5 billion. As phenomenal as this growth has been, electronic scientists are predicting that the industry is still in its infancy. Much of their optimism stems from the rapid development of a radically different device known as the junction transistor.

Initial results of transistor application have been most encouraging.

It is expected, for example, that the transistor will make possible portable television receivers, long-distance telephone dialing, better electronic computing machines, and smaller hearing aids. Improvements in radar, aircraft controls, and guided missiles are also seen.

The junction transistor is radically different because it employs a solid material to detect, transmit, and amplify wireless electric signals, or, when used as a rectifier, to convert alternating current into direct current. Heretofore, it was considered that these jobs usually had to be done by vacuum tubes, like, for example, those found in radio and television sets.

Compared to the vacuum tube, the transistor offers distinct advantages. Transistors are considerably smaller in size, usually about three-sixteenths of an inch in diameter. They need much less power, are more shock-resistant, and have longer life. According to one leading authority, "in principle, a properly made transistor should last forever if not abused."

A limited number of transistors are already being produced, almost exclusively for the armed services. Mass production of uniform-quality transistors, however, is still to be achieved. Much work, furthermore, remains to be done on the redesigning of circuits suitable to the characteristics of the transistor. Research on these and other production and development problems is now in progress at the Bell Laboratories (credited with the invention of the transistor in 1948), Western Electric (Bell's Subsidiary), and at other organizations engaged in electronic research, including Battelle.

Transistors are made from a relatively unknown and unused metal called germanium. It is one of a group of "semiconductor" materials, so named because they combine the properties of a conductor like copper and an insulator like glass. This characteristic provides germanium-made transistors with a natural, built-in mechanism for detecting, transmitting, and amplifying wireless electric signals, or for rectifying alternating current.

Studies are being made on other semiconductor materials including silicon, boron, selenium, tellurium, and com-

pounds of copper, lead, and zinc. Selenium, of course, already has an established market for use in making certain types of rectifiers. Considerable promise is seen for use of silicon as a semiconductor where heat resistance is especially required. Generally, however, germanium currently holds the stage for commercial electronics development.

The future of semiconductors, as a group, depends primarily on the ability of scientists and product engineers to develop methods for their purification and control. To secure desired electrical properties, semiconductor materials must first be refined to an extremely pure state. Control of electrical properties is then obtained by adding to the purified semiconductor material a very tiny, measured amount of impurity such as arsenic, indium, or gallium.

Techniques for securing desirable properties from germanium are further advanced than those being developed for other semiconductor materials. This metal so far has proven itself easier to purify and control. First of all, germanium has a simple, diamond-like, cubic structure. In other words, the structure of germanium crystals is the same in all directions. Additionally, the metal has a low enough melting point to resist contamination by reaction with the materials in which it is melted.

The cost and supply of germanium favor its development as a semiconductor. Potential supply of the metal apparently will permit expansion of the transistor industry, even though present demand exceeds supply. By 1956, it is estimated that 20,000 to 40,000 pounds of high-purity germanium will be needed annually. According to a 1949 estimate made by the U. S. Bureau of Mines, the Eagle-Picher Company, the country's largest germanium producer, has 480,000 to 4,800,000 pounds of the metal recoverable from its zinc reserves in Missouri, Kansas, and Oklahoma. Other potential U. S. producers, such as the American Zinc Lead and Smelting Company and the American Smelting and Refining Company, are expected to add to the supply of germanium through extracting it as a by-product of their zinc-processing operations. Zinc ores in the Belgian Congo and southwest Africa offer promising new sources overseas. In the United States and Great Britain, an active search is in progress to recover germanium from coal.

The cost of germanium for transistor use is a minor factor. Although the metal currently sells for \$340 per pound, less than seven cents worth (.0002 lb.) is needed to make one transistor. The big job, of course, is to reduce processing and other production costs which, at the present time, run the selling price of a good transistor up to around \$30.

It seems almost a certainty that the transistor will eventually replace the vacuum tube for low-power applications. Recent improvements on the new device indicate also that it will find uses as a rectifier in the heavy-current field. Most important perhaps will be the opening of new frontiers for electronics application that have remained relatively untapped because of the limitations of the vacuum tube. With all products involving semiconducting materials, however, unusually close teamwork between electronic specialists, metallurgists, physicists, and chemists will be necessary before large-scale production rates can be reached.

Editor's Note—While the views expressed on this page are not necessarily those of this bank, the *Monthly Business Review* is pleased to make this space available for the discussion of significant developments in industrial research.