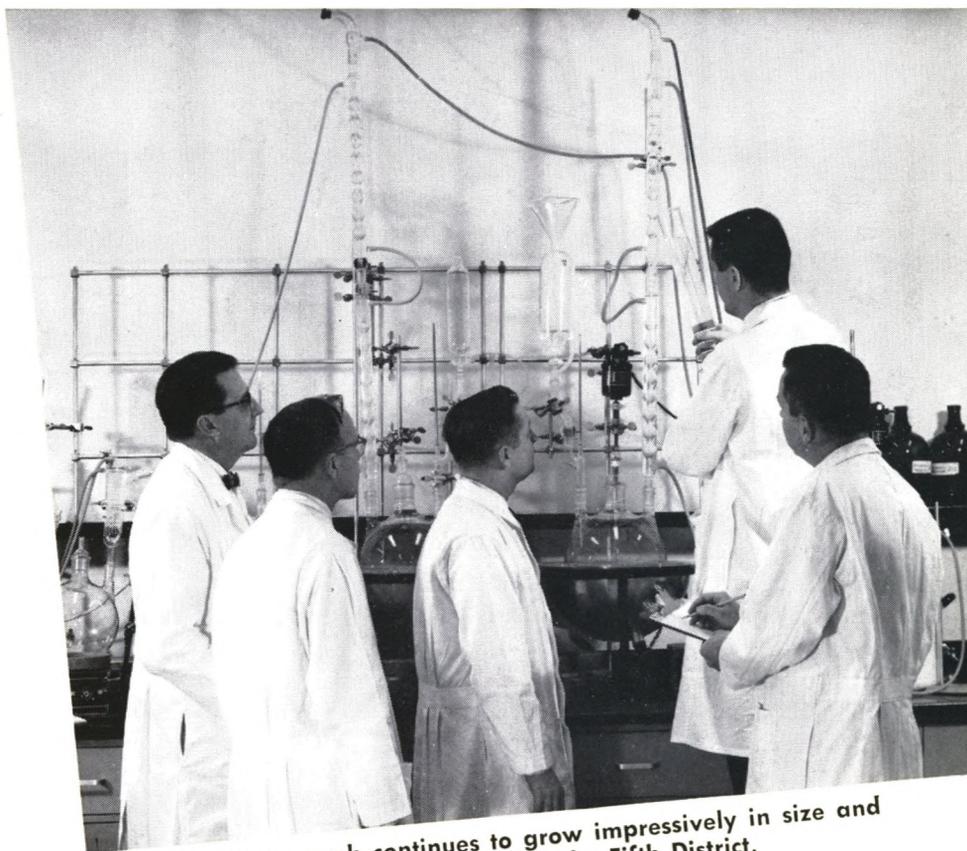


MONTHLY REVIEW

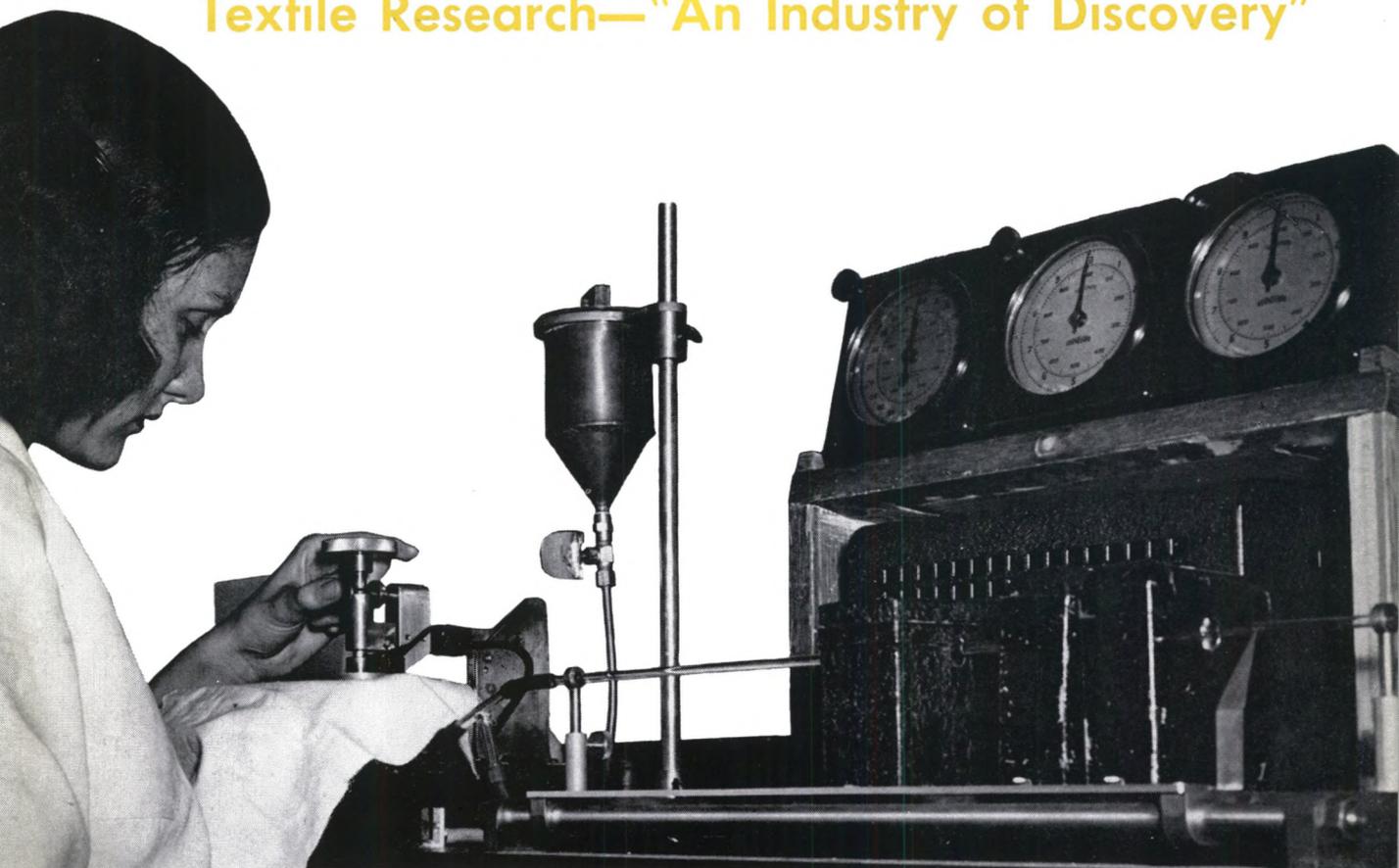


Textile research continues to grow impressively in size and accomplishment in the Fifth District.

FEDERAL RESERVE BANK OF RICHMOND

MARCH 1960

Textile Research—"An Industry of Discovery"



A supposedly indestructible and unstainable white suit was represented in a British motion picture a few years ago to be good and sufficient cause for panic in every quarter of the textile and apparel industries. With such garments available, all but a few firms engaged in the manufacture of cloth and clothing might conceivably find themselves going out of business. One human trait in particular, however, makes this quite unlikely. People like variety. The men and women of the future may value disposability more than durability—much as do children of today. The time may come when even men's suits will be sold by vending machines in handy packages of a dozen, perfectly tailored in assorted styles and fabrics, neatly pressed, graded for warmth or coolness, impervious to soup and gravy, and in spite of all this to be worn a few times and thrown away.

The imagination always responds to the thought of possessing the power to peek into the future through the slowly unfolding curtain of time. When imagination reacts upon an accumulation of knowledge it generates the kind of ideas that are the origins of progress. This reaction between

imagination and knowledge is taking place in centers of textile research which on the map of the United States form roughly a great arc swinging from the northeast down through the eastern and southern states into Texas. Located around the center of this arc are the textile research facilities of the Fifth District, a versatile combination of experienced men and specialized equipment ready to tackle any project related to the investigation, processing or production of any fiber, filament or fabric.

"THE PRODUCT OF RESEARCH IS KNOWLEDGE"

Three main groups support the many phases of textile research. The principal responsibility is assumed by the textile producing companies themselves who are in many instances pursuing their own individual projects for the development of new products and processes as well as cooperating to support study of the many broad problems with which all producers are concerned. The colleges and universities provide basic research facilities and personnel, educate both administrative and technical specialists for the textile industry, and

serve as the centers of cooperative effort sponsored by textile firms. Government enters the picture providing financial support for a wide range of studies for the general benefit of the entire industry. The United States Department of Agriculture is actively assisting in projects to improve the quality of cotton fiber through improvements in production and processing and is cooperating in the maintenance of facilities for the study of the spinning, knitting and weaving processes. State governments are making their contribution through support of institutions of higher education where research activities are concentrated.

A complete list of textile research facilities in the Fifth District would include several private research companies, an impressive number of chemical and textile companies, as well as some colleges and universities. This brief article, however, of necessity mentions only a few examples. These provide a general picture of the organization and accomplishments of the Fifth District's textile research centers.

In the nation's capitol Harris Research Laboratories has for fifteen years been conducting projects in "basic research" (into the chemical and physical properties of fibers) and "utilization research" (for greater usefulness and attractiveness of fabrics) under the sponsorship of many different clients. Harris's contributions to cotton range from studies related to the beauty, luster, wash-and-wear characteristics and general appearance of fabrics to water-repellent and mildew-resistant finishes for Army use. The staff which originally numbered twelve has grown to more than sixty members and includes chemists, physicists, biologists and textile technologists. This organization has become the largest independent, private textile research laboratory in the nation. The textile research projects are carried out in a modern building with about 22,000 square feet of floor space equipped with chemistry and physics laboratories, wind tunnel machinery for testing the passage of heat and moisture through fabrics, rooms which are dust-free and maintain constant, predetermined conditions of temperature and moisture, radioactive tracer equipment and other specialized analytical instruments.

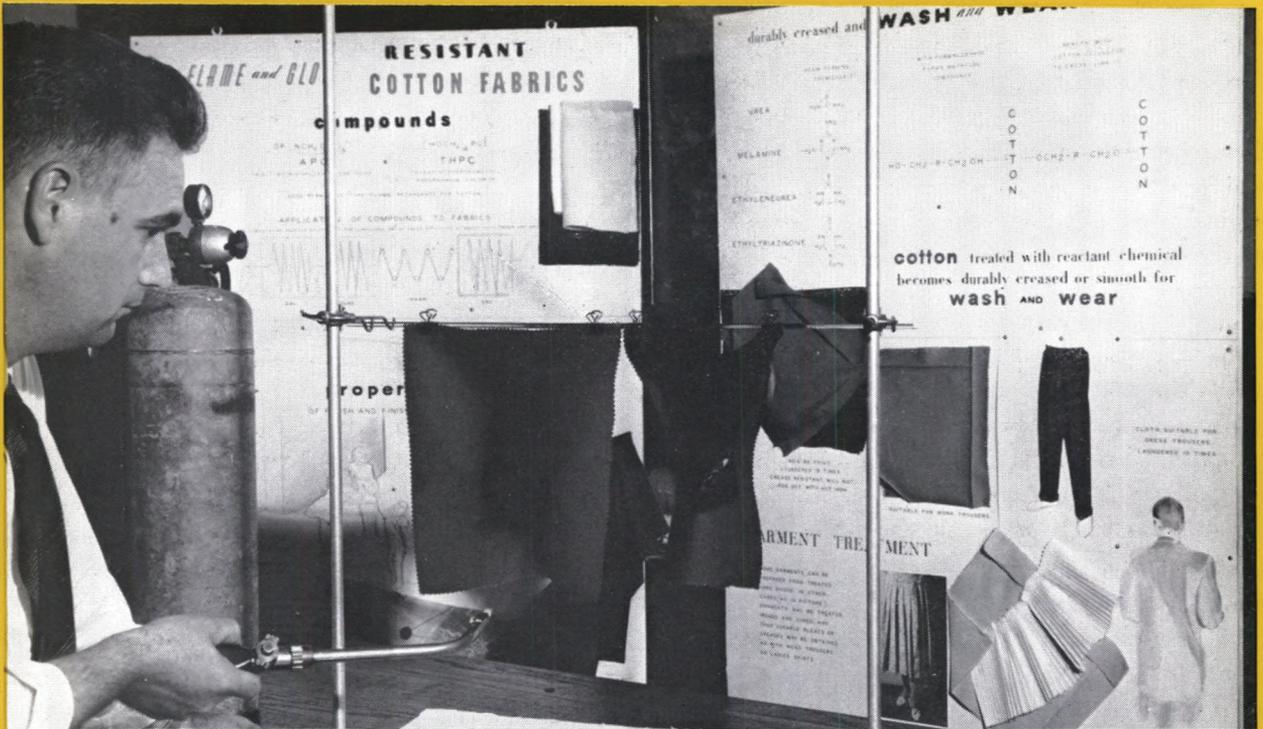
"RESEARCH—A KEYSTONE OF PROGRESS" One hundred and ten miles southwest of Washington,

a mile or two west of Charlottesville, Virginia, is the Institute of Textile Technology. This organization is jointly owned and financed by a group of mills having cotton spinning and weaving equipment. It has been in operation for sixteen years, but was established upon records, knowledge and experience accumulated over a much longer time by the sponsoring companies. Parallel programs, highly integrated and inseparable in terms of significance, are conducted at the Institute. In the capacity of technical advisor and assistant to its sponsors, the Institute may undertake any sort of cotton research project. In its capacity as a center for the training of technical experts in the field of textiles, the Institute has the status of a graduate school of textile technology. It is chartered by the Commonwealth of Virginia with the power to grant both the Master of Science and the Doctor of Philosophy degrees.

The Institute divides its research activities roughly into two categories—relatively short-range projects and relatively long-range projects. Items in the former group arise as a result of requests by mills for help on particular problems such as studying and correcting causes of customer complaints, training personnel, evaluating new products, and many others. It is estimated that between 200 and 250 such projects are completed by the Institute staff each year.

Among the relatively long-range projects are those which deal with problems related to raw materials, quality control, the design and testing of new equipment, or any avenues of investigation leading toward the potential improvement of textile products and processes. The work of the Institute in recent years has resulted in important long-range developments in such areas as new chemical treatments for cotton fabrics, instruments for measuring product characteristics and controlling production operations, modifications of existing equipment, quality control procedures and the use of advanced mathematics with the aid of electronic computers in seeking solutions to textile research problems.

"RESEARCH IS AN ATTITUDE OF MIND" In North Carolina, the cities of Raleigh, Durham and Chapel Hill mark a three-sided area which is becoming widely known as "The Research Triangle." Here the principal establishment devoted to the study



of textiles is the Textile Research Center of the School of Textiles, North Carolina State College. T.R.C. was founded in 1948 by the State of North Carolina and the North Carolina Textile Foundation, Inc., an organization of more than 450 mills, fiber producers, enterprises related to the textile field, and interested individuals. T.R.C.'s staff, originally just two people, has grown to nearly one hundred textile technologists, chemists, physicists, technicians and other personnel. Its annual budget is now close to \$600,000.

The scientists at the North Carolina State College Center are interested in all phases of industrial textile research. Since the textile industry has provided nearly all of the financial support behind the Center, most of the projects have been rather directly related to increasing the quality and improving the efficiency of production of textile products. The Center operates through two major departments, a Processing Division and a Chemical Division. The first plans and carries out projects in all phases of the development and processing of all major fibers to the gray cloth stage. The second studies the chemical characteristics of fibers, and of bleaches, dyes and finishing processes for all kinds of fibers and fabrics.

T.R.C. has four other departments: a section concerned with the development of textile machines and instruments, a library, a photography division, and a testing and microscopy division.

The Textile Research Center places special emphasis on the need for more basic research—"pioneering textile research" is the way it is frequently expressed there. A long step was taken in this direction with the completion of a laboratory for the study of possible applications of nuclear energy to textile materials and manufacturing. Another significant step was the installation of an IBM 610 computer for use in developing applications of computers to textile technology.

Starting July 1, 1959, the General Assembly of North Carolina appropriated \$80,000 a year to support basic research in textiles. These funds are being expended on advanced programs in textile and polymer chemistry and physics that will in the future lead to the granting of doctoral degrees in these areas.

"RESEARCH EXPANDS EARNING POWER" More than 250 miles separate North Carolina's "Re-

search Triangle" from South Carolina's growing counterpart at Clemson College. The Clemson School of Textiles has a staff of about 30. A wide variety of projects sponsored by various textile manufacturers are under study. The purposes of these studies include the improvement of fibers, yarns and fabrics, the betterment of quality and efficiency in manufacturing processes, and the development of better bleaching and finishing agents. The United States Department of Agriculture's marketing and research services maintain on the Clemson campus three laboratories equipped to conduct extensive experimental work on the production, processing and manufacturing of cotton. One of the projects in its current program, designed to boost cotton's versatility and usefulness still higher, deals with ways and means of making elastic cotton yarn, and making its elasticity as permanent as possible.

One of the initial facilities at the Ravenel Research Center on the Clemson campus is a research and development building of some 40,000 square feet built by a textile machinery firm. As in the case of North Carolina's Research Triangle, Ravenel provides an ideal opportunity for academic personnel, private industry and government to pool their talents and resources in what is truly a vital common interest.

"RESEARCH IS WEALTH-PRODUCING" In spite of all that is being done, serious doubts are being expressed concerning the adequacy of our textile research effort. For example, it is contended that more research may be necessary to enable the textile industry to meet foreign competition successfully. Governor Hodges of North Carolina has predicted on the basis of his visit to Soviet textile mills that present foreign competition is mild compared to that which Russia is capable of offering. The textile industry has spent less than 0.5% (some estimates are as low as 0.1%) of the value of sales for research in contrast to a figure of about 2% as the average for other manufacturing industries. Present developments indicate that a new era of more intensive research is beginning. More and more companies are building or expanding research facilities. One of these days it may be possible to make that "indestructible suit"—if so, it is likely to be the result of progress and accomplishment of Fifth District research centers.

Monthly Review looks at . . .

THE EASTERN SHORE

Water-bound by the Chesapeake Bay on the west and the Atlantic on the east, the Eastern Shore might be called the Maritime Province of the Fifth District. Predominantly rural, it is peopled by a hardy, independent, and friendly folk who proudly treasure their centuries-old traditions as well as the comforts of today.

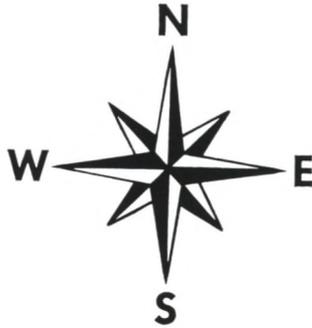
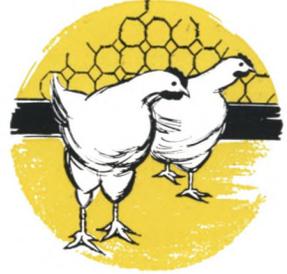
Modern highways, Maryland's famed Chesapeake Bay Bridge, and efficient ferries operating from the Norfolk area to its southern tip facilitate travel to and from the Shore. More importantly to its truck farmers, perhaps, they put the area within overnight transportation distance of many of the large consumer markets of the East. The proposed bridge-tunnel between the Shore and a point near Norfolk will undoubtedly increase the Eastern Shore's tourist and business traffic.

The economy of the Eastern Shore is centered primarily around its agricultural, manufacturing, and commercial fishing activities. Farming is the Shore's largest industry. It provides the major source of income and is the area's biggest employer, accounting for up to one-fourth of all workers. Poultry and large-scale truck farming are the main farm income producers. Broilers are big business and have made the Shore one of the most intensive poultry-producing regions in the United States. Its truck crop industry is also one of the oldest and most concentrated in the nation. Dairying, another large segment of the area's agriculture, is important in the northern counties.

Manufacturing, second to agriculture in economic importance, provides employment for from about one-fifth to one-fourth of all employed persons. The canning and processing of farm products and the seafood catch is by far the leading manufacturing activity. The fishing industry is another major source of income and employment, providing oysters, crabs, clams and a wide variety of fish for millions of seafood fanciers.

Though the tradition-laden Eastern Shore retains much of the charm of its historic past, it is participating in some of the nation's most progressive scientific projects. The space-age activities now being carried on by the National Aeronautics and Space Administration's research station on Wallops Island have focused international attention on the Eastern Shore.





Housing Slows as Expansion Accelerates

Not since 1950 had bulldozer operators and builders been as busy as they were in 1959—clearing land and laying foundations for the seemingly unending variety of dwellings which added up to the impressive 1,342,900 new houses started last year. This was a sizable increase over 1958 and a near miss for an all-time high.

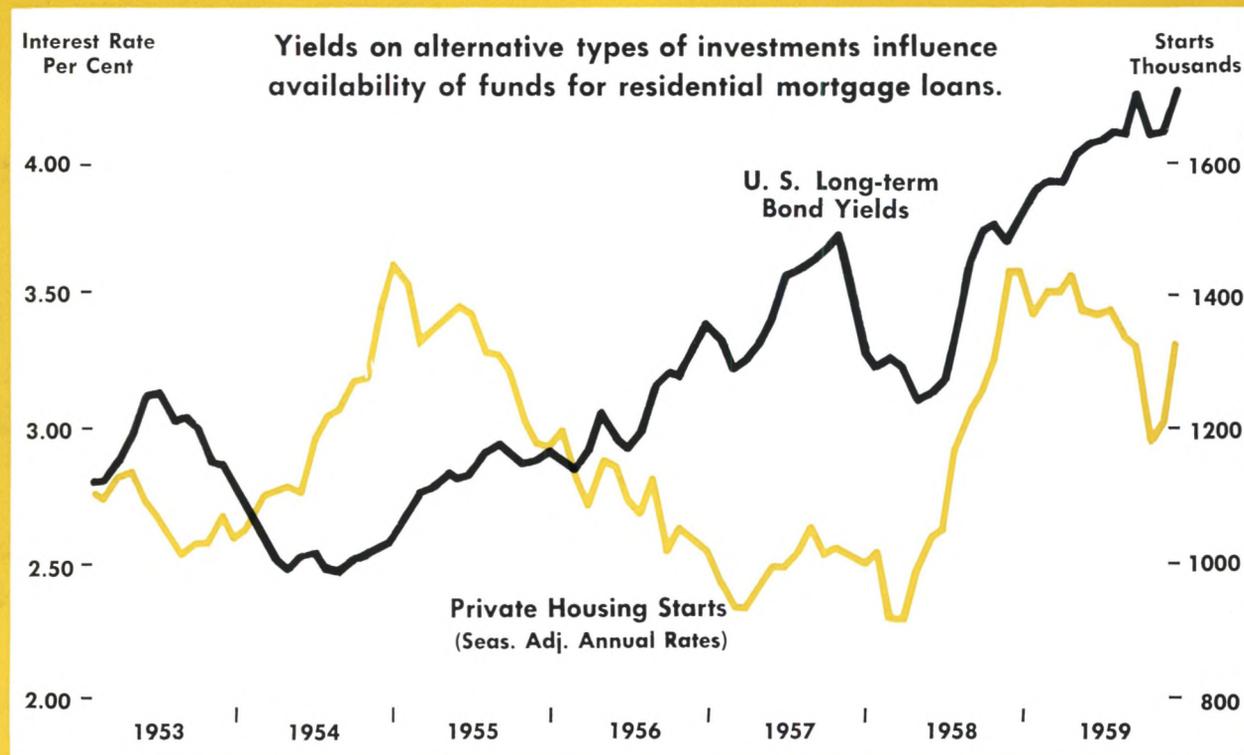
The more than \$22 billion that private nonfarm residential construction cost last year did not miss a new record mark, however. The previous high was 1955's \$18.7 billion. Both the value of contracts awarded for one-family houses and apartment buildings and the number of dwelling units covered by those contracts were greater than in the previous year. Furthermore, an estimate of mortgage debt outstanding on one- to four-family homes at year-end indicates that an unprecedented net increase occurred during 1959.

CONTRA-CYCLICAL BEHAVIOR Nevertheless, residential construction's tendency to run counter to uptrends generally characteristic of over-all quickening economic activity began to manifest itself some months before the year ended. This

generated a feeling of uncertainty about housing's economic strength as the decade of the sixties made its entrance.

The number of new houses started reached a five-year high in April (on a seasonally adjusted, annual rate basis) but then declined gradually through the summer and early fall. Funds going into residential construction continued to increase through early summer, but then decreased slightly each month from June through November. The value of contracts awarded for residential construction totaled approximately \$650 million less in the last half than in the first half of the year, and the number of dwelling units for which contracts were awarded was nearly 80,000 smaller. A moderate slowdown in home mortgage lending was apparent by late summer as those who sought to borrow in order to buy or build encountered stiffening competition for the available supply of loanable funds.

FLASHBACK—"HOUSING AIDS RECOVERY" "Demand for new houses strengthened just as the recession reached bottom and provided a timely contribution to the gathering forces of recovery" . . .





The number of private multi-family dwelling units put under construction was greater in 1959 than in any previous year of record.

“Expenditures on home construction began to expand last summer and contributed to recovery from the 1957-58 recession” . . . “Greater availability of mortgage credit proved vital in accelerating home-building activity in 1958, as it had in the two earlier postwar recessions.” Thus was the prominent role housing played in providing a much-needed boost to slow-paced business activity in the 1957-58 recession highlighted in the *Monthly Review* just one year ago.

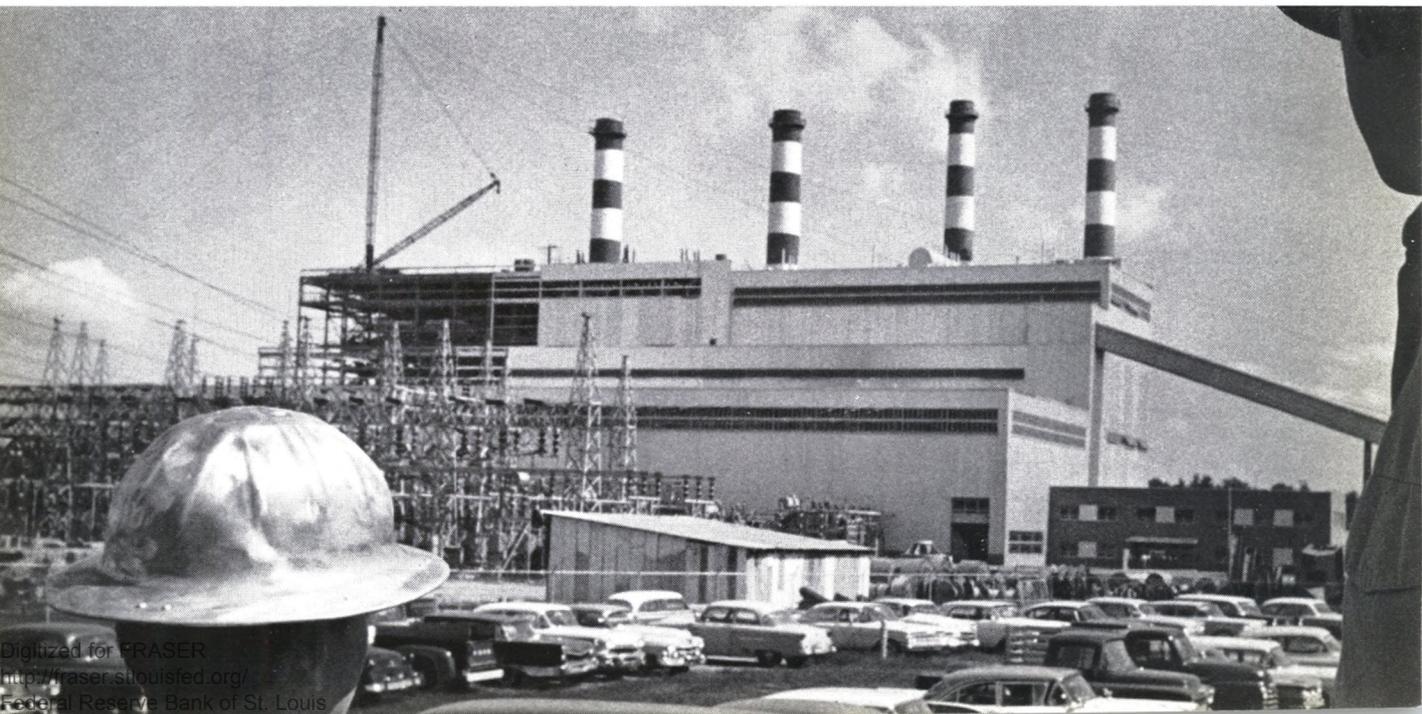
A SEEMING PARADOX The contrast between those few words, “*greater availability of mortgage credit,*” which characterized home financing in early 1958 and those describing mortgage market developments during 1959, “*stiffening competition for the available supply of loanable funds,*” helps

to explain why “housing aids recovery” but recovery does not appear to aid housing.

During recession months when business activity slowed, a large volume of loanable funds flowed into the mortgage market, partly because of smaller demand for capital from business and industry and partly because mortgage loan yields stacked up favorably with yields on other types of investments. With financing no problem, home construction began to enter an uptrend just as the 1957-58 recession touched bottom.

A continued high volume of savings flowing into investment institutions and mortgage loan commitments made earlier in the year enabled housing to maintain its momentum through late 1958 and into the early months of 1959. But as

As business and industry expanded, potential home mortgage borrowers met more competition from other borrowers for loanable funds.



Federal Government debt financing increased and as businesses rebuilt depleted inventories and reconsidered expansion plans shelved during recession, competition for borrowed funds quickened, forcing interest rates up and making financing for prospective home buyers and builders both more costly and increasingly hard to come by.

CONVENTIONAL LOAN RATES REACT By December of last year, the $5\frac{1}{2}\%$ to $5\frac{3}{4}\%$ rates on conventional mortgage loans (those neither insured nor guaranteed by the United States Government) typical in the first quarter of 1959 had given way to yields of 6% and above.

Surveying the mortgage market at year-end, the National Association of Real Estate Boards found that the proportion of communities which reported the supply of mortgage money for conventional loans "ample" dropped sharply from March to December, while the percentage describing it as "moderate" more than doubled and that terming the supply "tight" nearly quadrupled. Following a complementary trend, the number of new non-farm houses started with the aid of conventional financing hit an all-time high of 92,849 in April, then declined in each succeeding month to 62,432 in November. However, the proportion of housing starts financed with conventional loans rose from 62% at the end of 1958 to 69% at the end of 1959, evidencing the relatively greater drawing power of conventional financing, with flexible interest rates, relative to government-aided financing, with fixed interest rates, in a tight money period.

FHA AND VA RATES MOVE UP To help alleviate the pressure on Government insured and guaranteed mortgages caused by rises in interest rates on alternative types of investments, Congress raised the maximum interest rate on VA home mortgages from $4\frac{3}{4}\%$ to $5\frac{1}{4}\%$ in July 1959, and in September the FHA authorized an increase in the maximum interest rate on FHA-insured mortgages to $5\frac{3}{4}\%$ from the $5\frac{1}{4}\%$ then in effect. Yields on many other types of investments continued to rise through year-end, however, and the competitive position of FHA and VA mortgages was not appreciably improved by these increases.

Following the July rate change, a slight—but temporary—improvement occurred in the private market for VA mortgages. The September increase in the FHA rate did bring about a slight reduction in secondary-market discounts. On September 1 the price averaged \$95.80; on December



Savings and Loan Associations put a record \$12 billion into mortgage loans for home purchase and construction last year.

1, \$96.40. On February 1, 1960, the secondary-market price of FHA-insured mortgages bearing $5\frac{3}{4}\%$ interest averaged \$96.30.

Although requests received by the Veterans Administration to appraise proposed new homes ran well ahead of the previous year during the first six months of 1959, the drop-off which began in July continued through December to reduce the year's total slightly below that for 1958. A downturn in applications for FHA loans also started in mid-summer and extended through November. Hopes for a reversal of this trend which were raised by a surprising jump in applications during December were short-lived, as January 1960 applications showed a greater than seasonal drop from the month before.

the **FIFTH** district

1960 had an auspicious beginning with employment and production expanding through January and undoubtedly giving income of Fifth District residents another upward push. Significantly, the expansion of business activity has been on a broad front. Plus signs have been shown by most of the District's principal industries, including textiles, cigarettes, furniture, food, primary metals, lumber, and transportation equipment. One of the few downturns reported was in construction contract awards, although the sharp decline here may have been a reaction in part to the equally strong rise in the preceding month.

Although available February reports disclosed no significant signs of current weakness in the District economy and business confidence remained high, there was a tendency of businessmen to moderate earlier estimates of the strength and length of the business upsurge. Whether the change in business sentiment stemmed from the influence of the customary seasonal slowdowns of February or whether it had other origins may possibly be disclosed this month. In any case, developments this month will be examined unusually carefully as possible harbingers of the 1960 economic story.

MAN-HOURS GAIN Man-hours in Fifth District manufacturing industries in January posted a 1.8% increase over December after adjustment for seasonal factors. The gains were widespread, including all District states and all industry groups except electrical machinery and printing and publishing. An especially strong increase was recorded by the transportation equipment industries as automobile assembly plants in Norfolk and Baltimore stepped up production. Sizable gains were also made in fabricated metal products and tobacco manufactures.

Nonfarm employment after seasonal correction rose from December to January in all Fifth District states. The increase for the District as a whole was 0.5%, with West Virginia making the largest gain. West Virginia's January employment total, however, remained below the year-ago level. The industry groups which chalked up gains were manufacturing, both durable and non-

durable, contract construction, trade, government, and transportation, communication, and public utilities. Declines occurred in mining, service industries, and finance, insurance, and real estate.

THE TOBACCO STORY Cigarette production in both the U. S. and the Fifth District reached record levels in 1959. This signaled an excellent year for District tobacco factories, which account for 80% of U. S. cigarette output. Production of cigarettes in the District in 1959 registered the fifth consecutive yearly increase with a 7% gain over the 1958 level. In addition to cigarettes the Fifth District is also a center for manufactured tobacco (plug, twist, fine-cut chewing, scrap chewing, smoking, and snuff). Only 6% of the factories in this group are in District states, but they account for about half of U. S. production.

In addition to record output, the cigarette indus-

Machines that produce more than 1200 cigarettes every minute enable supply to keep pace with the growing demand.



try in 1959 saw the introduction of a host of new brands, bringing the total number of sizes, shapes, and trade names to an estimated 117. From this wide range of choices the 58 million smokers in the country could choose regular or king size, filtered or nonfiltered, mentholated or nonmentholated, and even such items as tobaccoless cigarettes. At the end of the year filtered cigarettes appeared to have secured about 50% of the market. Menthols made big gains during the year, and with many new brands introduced, captured about 10% of total sales.

TEXTILE WAGES BOOSTED In confirmation of widespread rumors that had been circulating in the textile industry, many of the District's mills have announced wage increases for their employees. These wage hikes, which became effective February 29, were expected to average 5% although the exact amount of the increase was not made known.

There was considerable speculation as to whether the wage increase would be followed by a rise in the prices of industrial fabrics. This conjecture was based in large part on the fact that these prices have not risen as much as have prices of other cotton fabrics in the past year. Another, and possibly more important, factor was that orders for auto fabrics were reported to be fairly slow. In general, it was not expected that the wage increase would lead to the widespread price increase that followed the wage boost a year ago.

Sales of cotton gray goods by District mills have been very slow so far this year. Orders for certain kinds of cloth have been satisfactory, but there has been no tendency on the part of buyers in general to add to the orders they have already placed with mills. Most mills still have large backlogs of orders, however, and are maintaining operations at a high level. Mills weaving synthetic fabrics have booked orders for delivery as far in advance as the third quarter. This has built up their backlog of orders to its highest level since the Korean War. Cotton yarn mills also have large backlogs of orders as they have sold practically all their production through June.

Man-hours, seasonally adjusted, in District textile mills in January showed a good increase over December. All three categories, broadwoven fabric mills, yarn and thread mills, and knitting mills, bettered their December performance during January. In February mill operations in some scattered areas were affected by outbreaks of flu, which kept employees home and forced rearrangement of production schedules.

COAL TRENDS UPWARD In line with forecasts, bituminous coal production through January and early February ran ahead of year-ago levels. District coal output for the first five weeks of 1960 averaged 4% higher than the same period in 1959 but 11% under 1957.

After being hard hit by the 116-day steel strike last year, it is estimated that the rebound in bituminous coal demand in the nation may raise output to 430-460 million tons this year. Production in 1959, as in recession-bound 1958, amounted to 410 million tons. The expected increase for 1960 is based on expected record consumption by steel mills and electric utilities. Declines are expected in demand from other industrial customers and from retail and export markets. The prospects for improvement in overseas demand remain bleak. European markets for District coal are marked by heavy inventories and by increasing competition from oil and gas. Pithead stocks of coal in the European Coal and Steel Community countries at the last reported date (September 1959) totaled 32.6 million tons, up severely from 22.5 million tons at the same date a year earlier. Current reports indicate, however, some decline in coal inventories in recent months. District coal exports have shown a somewhat improved trend since December 1959 but are still substantially below year-ago levels.

BANKING District banking activity in recent weeks has reflected quite well the recent strength of the District economy. At weekly reporting banks, loans climbed some .7% during February—a much better than seasonal performance. Business borrowing was particularly heavy.

Other indications of continued pressure on banking resources during February included sharp increases in loan-deposit ratios, sizable sales of Government securities, fairly heavy borrowing at the discount window, and net purchases of Federal funds by larger District banks active in the Federal funds market.

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