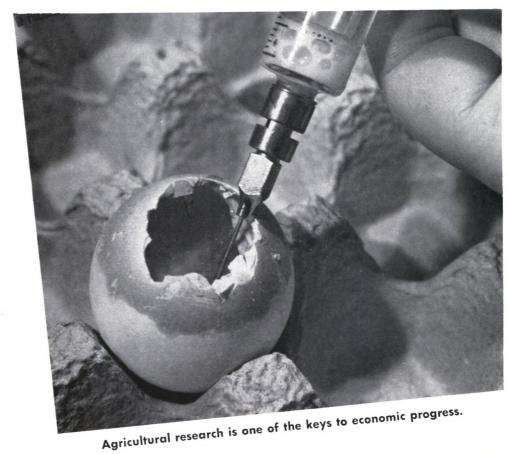
### MONTHLY REVIEW



FEDERAL RESERVE BANK OF RICHMOND

OCTOBER 1960



### RESEARCH SERVES FARM AND HOME

"Research is a high-hat word that scares a lot of people. It needn't. It is rather simple. Essentially, it is nothing but a state of mind—a friendly, welcoming attitude toward change. Going out to look for a change instead of waiting for it to come. Research, for practical men, is an effort to do things better and not to be caught asleep at the switch. The research state of mind... is the problem-solving mind as contrasted with the let-well-enough-alone mind... It is the 'tomorrow' mind instead of the 'yesterday' mind."

-Charles F. Kettering

Early in September the four Stone brothers of Robeson County, North Carolina, sold more than 7,000 pounds of flue-cured tobacco for an average price of \$66.03 per hundred pounds—well above the market average. Selling good quality tobacco for better than the average market price is not unusual, of course. But this Robeson County tobacco was different. It had been cured by a new bulk-curing method which reduces the labor needed for harvesting and curing by as much as 60%. There are also significant savings in fuel costs, and the barn's electronic controls produce a more uniform leaf.

The new bulk-curing technique, developed by engineers of the North Carolina Agricultural Experiment Station, is but one of many examples of research efforts to find new products and develop new and better ways of doing things for the nation's farms and homes.

PROGRESS THROUGH RESEARCH Today, farmers are producing 57% more food, fiber, and tobacco on about the same amount of land used in the late thirties. And they are doing this with fewer workers and with considerably fewer hours spent at farm work. More production with less work means that farm labor productivity has risen greatly. During 1958, output per man-hour on the nation's farms was more than four times as high as before World War I and almost three times as high as in the years immediately preceding World War II.

One farm worker in the country today produces enough food, fiber, and tobacco to support himself and about 22 other persons. This is more than double the number of persons supplied with agricultural products by each farm worker in 1940. And it is almost four times the number supported per worker in 1890, three years after the passage

of Federal legislation establishing agricultural experiment stations in each state.

Much of this increased output has been the result of technological advances made possible through research. By putting science to work on the nation's farms, new and higher quality products have been produced, Mr. and Mrs. Consumer have been provided with a better diet at less cost, and many rural workers have been released for industrial employment.

Agricultural research has also been responsible for the formation of many new farm-related industries—manufacturers of farm machinery and other farm supplies and those businesses engaged in processing and marketing farm products. These activities have provided jobs for many people. Today, in fact, there are about two persons employed in agriculture-related work for every person engaged in work on the farm.

**SEEDS OF RESEARCH PLANTED EARLY** The states of the Fifth District have been leaders in agricultural research since the earliest years of the nation's history. South Carolina's Lord Proprietors, in fact, established America's first agricultural experimental farm on the Ashley River in 1669. George Washington and Thomas Jefferson, both skilled farmers and inventors of farming implements, were also prominent among those who made initial efforts to improve agriculture and spread agricultural information.

Agricultural societies, the earliest of which were organized in 1785 in Philadelphia and in Charleston, South Carolina, were outstanding in their early attempts to foster the improvement of agriculture. They not only used their influence to establish state boards of agriculture and the teaching of agriculture in secondary schools and colleges but they also promoted the carrying on of agricultural experiments and scientific investigations.

Efforts such as these prepared the soil and planted the seed for what we know today as agricultural research.

A growing public demand for increasing agricultural knowledge finally provided the impetus for passage of basic legislation that led to the establishment of the nation's many publicly-supported agricultural research centers. The two parent measures were enacted in 1862. The first of these called for the establishment of the U. S. Department of Agriculture. The second, known as the Morrill Land-Grant Act, provided for the establishment of a land-grant college in every state.

Leaders of the Department of Agriculture soon

found, however, that research findings needed to be adapted to differences in climate, soils, and other local conditions. And the newly-created colleges quickly learned that there was little scientific information on agriculture available for teaching. These developments led to the passage of the Hatch Act of 1887 which made provision for setting up and maintaining agricultural experiment stations in every land-grant college. This legislation became the foundation stone for the close Federal and state cooperation in agricultural research that still exists today.

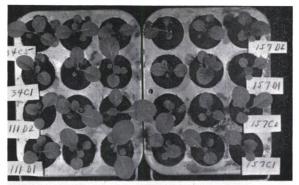
**TODAY'S RESEARCH CENTERS** The major agricultural research centers in the Fifth District are the five state agricultural experiment stations (including their 44 outlying substations, field laboratories, and experimental farms) and the research agencies of the U. S. Department of Agriculture.

A tour of these principal centers of agricultural research would include stops at the following places: the main stations of the state agricultural experiment stations located at the University of Maryland, West Virginia University, Virginia Polytechnic Institute, North Carolina State College, and Clemson College; the Department of Agriculture in the nation's capital, its Agricultural Research Center in Beltsville, Maryland, and its other research facilities in Richmond, Asheville, and Clemson. A number of private organizations and institutions in this five-state area also make a considerable contribution to the improvement of agriculture through research.

Research at the state experiment stations is financed by both Federal and state funds. Much of their work, however, is done in cooperation with private industry. These private interests not only provide funds for certain research projects but also furnish commodities, equipment, and facilities such as processing and packing plants for experimental use.

The farm people of North Carolina have a unique method for supporting agricultural research. Called "Nickels for Know-How," it is a program through which they pay five cents per ton on all the feed and fertilizer they buy. The money goes to their land-grant college to support research, teaching, and extension activities. During the past nine years contributions to the "Nickles" fund have amounted to \$1,164,000.

Some idea of the growth of the work at the District's five state experiment stations in recent years can be found by looking at the increase in their expenditures and in the number of research work-



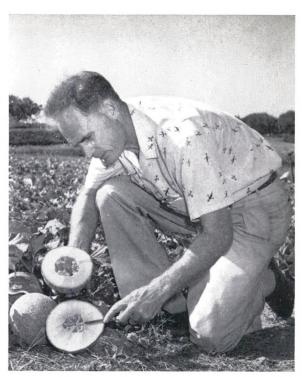


Laboratory tests to determine the degree of resistance to black shank speed up the development of new tobacco varieties.

ers. Total expenditures in 1959 amounted to some \$10.6 million, more than double the amount spent only eight years earlier in 1951. Non-Federal funds—state appropriations, industry and foundation grants, and income from other sources—expended that same year came to some \$7.0 million, or two-thirds of the total. Thus, for each \$1 of Federal grants expended, the five state stations also spent an average of \$1.95 in non-Federal funds. In addition to these funds for research, further expenditures were made by the land-grant colleges for resident instruction and extension activities.

During this same eight-year period, the research personnel of these five stations increased about 25%. Of the nearly 800 staff members employed in 1959, 355 devoted full time to station research. The remainder divided their time between research and teaching or extension work. In the role of extension worker, they helped to carry the information and technical know-how gained through research to the fields and homes of every community in each state.

**RESEARCHERS AT WORK** Scientists of the state agricultural experiment stations and District agencies of the U. S. Department of Agriculture conduct broad programs of both basic and applied research in almost every phase of agriculture and



A new cantaloupe variety named Edisto added over \$500,000 to South Carolina farm income the first year it was grown.

rural life. Experiment station researchers in North and South Carolina alone were carrying on some 700 separate research projects in 1959. To illustrate the wide range of problem-solving studies, let's look at a few notable achievements.

South Carolina station scientists in 1938 made an outstanding contribution to southern agriculture when they accidentally defoliated cotton with a chemical. Because of its economic importance. chemical defoliation of cotton is now common practice throughout the cotton belt. The station's plant breeders in more recent years have released a new high-yielding variety of wheat, named Anderson, and a new cantaloupe called Edisto. This melon is said to have added over \$500,000 to the state's farm income during its first year of production. The station's agricultural engineers in cooperation with USDA have just recently developed a one-bale, basket-like container for handling seed cotton which can be removed from the truck or wagon at the gin. This means that farmers will no longer have to wait hours at the gin for their cotton to be processed.

Researchers at the North Carolina station have succeeded in adapting flavor-control equipment to remove off-flavors—such as wild onion—from milk. They have developed a new and superior peanut, the NC 4x or atomic peanut, by bombard-

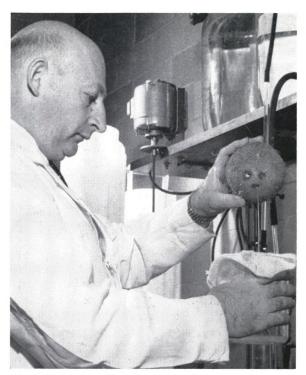


Soil profile modification—deep plowing and liberal fertilization—looks like a promising way to reduce drought effects.

ing peanut seed with atomic radiation. And animal industry scientists at the North Carolina experiment station have devised a technique for transferring sheep embryos from one ewe to another. This will provide farmers with a practical means of obtaining several offspring per year from each ewe.

other accomplishments Research personnel at the Virginia station have produced the highly effective ground spray method of controlling mice in apple and peach orchards. Another significant accomplishment of this research center is the finding that, if all potential beef bulls were tested for growth rate from weaning to 12 to 14 months of age and only bulls from the top half used, the rate of gain in beef cattle could be increased from 1% to 3% per generation. In cooperation with USDA, Virginia station scientists have found that dairymen using a rotational grazing system can materially increase the return from pastures by letting their milking herd graze the top growth and their heifers and dry cattle the bottom growth.

West Virginia research teams have saved the state's poultry producers thousands of dollars by isolating, identifying, and developing control measures for the virus-like agent that causes infectious synovitis—a serious poultry disease. They have discovered that coconut milk can be



Discovery that coconut milk can be used to extend the life of semen may revolutionize the artificial breeding industry.

used as a semen extender—a development that promises to be of untold value to the artificial breeding industry because it will not only save technicians' time but will eliminate the need for expensive refrigeration facilities.

Swine-breeding research at the Maryland station has developed a new line of meat-type hogs to help meet housewives' growing demand for leaner cuts of pork. Maryland scientists have also designed and built a special machine, called the shear-press, which measures the textural quality of vegetables, apples, chickens, and turkeys. Commercial usage of this device has benefited both food growers and processors.

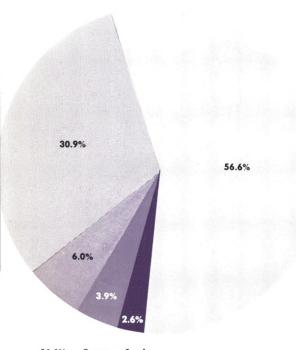
At USDA's Agricultural Research Center at Beltsville, Maryland, breeding, feeding, and management experiments have resulted in the development of high-quality, plump-breasted chickens and turkeys. The Center's nutrition studies, such as the determination of the amount of fat in raw and cooked foods, are, of course, of considerable significance to consumers.

These and the hundreds of other contributions of the District's agricultural research centers have played a leading role in bringing about a better balanced and more prosperous agriculture, a higher standard of living, and uncounted dollars and cents to the District economy.



# HOW COLLEGES INVEST THEIR MONEY

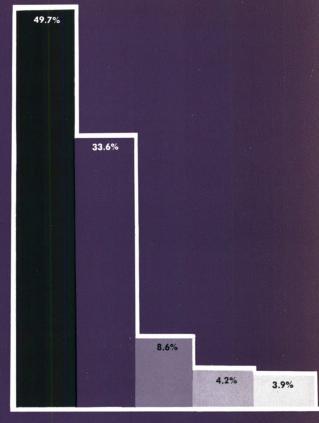
### **DISTRIBUTION OF INVESTMENTS**



56.6%	Common Stock
30.9%	Bonds
6.0%	Income-Producing Real Estate and Mortgage
3.9%	College Plant and Other
2.6%	Preferred Stock

Common stock holdings of 59 schools at the end of fiscal 1959 ranged from 18.9% to 75.2% of the market value of their endowment funds. In only seven cases was this figure below 45%.

### DISTRIBUTION OF INVESTMENT INCOME



### Common Stock

### O Bonds

Income-Producing R

### **CHANGES IN SECURITY HOLDINGS**

(for a representative grou

### BONDS

% of total endowment	Number of schools		
10-17	1955 3	1959	
18-25	7	10	
26-33	8	10	
34-41	13	10	
42-49	4	4	

YIELDS ON INVESTMENTS IN SECURITIES AND REAL ESTATE

5.26%

3.76%

3.69%

Total dividend income from common stocks in 1959 was only 50% of total investment income although common stocks comprised about 57% of total endowment funds. This is a consequence of the yield differentials shown in chart 3.

Care should be taken in comparing these yields. The different means of measurement limit the comparability of these figures. For example, market values were used in computing stock and bond yields, whereas book values were used in the case of investment in real estate and college plant. There is, of course, a fundamental difference between bond yields computed on the basis of a definite amount of expected future income and stock yields based on the return realized in the past 12 months from stocks.

### ERCENT OF TOTAL ENDOWMENT

lleges and universities)

ate and Mortgages

### **COMMON STOCKS**

College Plant and Other

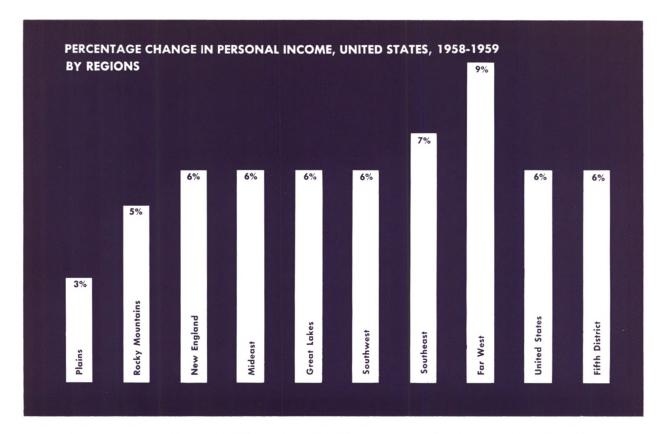
of total endowment	Number of 1955	schools 1959
41-46	4	2
47-52	9	8
53-58	16	10
59-64	5	8
65-70	1	7

The shifts shown in these tables reflect changing market values over the period as well as policy decisions of managers of the endowment funds to change the proportions of total funds committed to bonds and stocks. The marked rise in the number of schools with at least 59% of their funds in common stocks reflects the continuation of the postwar shift in the attitudes of these money managers toward equity investments.

The information used in this presentation was obtained from a statistical compilation prepared by Boston Fund, Inc., of college and university endowment funds in 1959. The list includes four schools in the Fifth District.

Preferred Stock

nttp://fraser.stiouisted.org/ Federal Reserve Bank of St. Louis



### **Factory Payrolls Pace District Income Gains**

Closing out a decade of record consumer prosperity, 1959 set a new high standard of personal income for residents of the Fifth District. Data released recently by the Department of Commerce show 1959 personal income at record levels in all Fifth District states, with the gain over 1958 among the best of the decade. Other District developments highlighted in the data are a sizable drop in farm income and a large increase in manufacturing payrolls.

THE REST OF THE COUNTRY For the nation as a whole, personal income in 1959 rose to an alltime high of \$381 billion. This was an increase of \$23 billion, or 6%, over 1958 and amounted to an additional \$97 of income per man, woman, and child in the country. As consumer price increases over the year came to only 1%, the largest part of the new income represented additional real purchasing power. Comparison with other years of the Fifties, in terms either of real purchasing power or of dollar payments, shows the 1959 increase to be one of the three best.

With the exception of three farm states—Montana and the Dakotas—which lost income, the national gain was fairly uniformly distributed over the country. The Fifth District's share of the increase amounted to \$1.7 billion, a shade better than the 6% national gain. This was at least as large a proportional gain as that in six of the country's eight regions. The Southeast, into

which broader region most of the Fifth District falls, registered a 7% gain, the second highest of all regions. The slight lag of the Fifth District behind other Southeastern states is explainable in large measure by the unusually large increase in cotton income in Mississippi and Arkansas. The only other region to experience greater proportional gains than the Fifth District was the burgeoning Far West, where total personal income rose by 9%.

**GAINS BY STATES** Within the Fifth District the best percentage improvement occurred in South Carolina, where total income rose by \$224 million, or 8%. Gains for other District states are shown in the accompanying table.

In terms of dollar changes, North Carolina and Maryland, with increases approaching \$500 million each, were the big gainers. Virginia was a close third, with an increase of almost \$400 million. Smallest gains were registered in West Virginia and the District of Columbia.

In per capita terms, the increase in South Carolina amounted to \$85. While this was less, in dollars, than the per capita increases in Maryland and the District of Columbia, it represents the best proportional increase—7%—in the Fifth District. The \$93 of income added per individual in the District of Columbia amounts to a 3% gain over 1958, lowest for the Fifth District. Identical 4% increases were registered in Virginia, West

Virginia, and Maryland, while the 6% gain in North Carolina was second only to that in South Carolina.

State gains in per capita income in the District compared favorably with those in states outside the District. South Carolina's percentage increase was as good as or better than that in 44 of the remaining 49 states. The 4% increase in most Fifth District states was at least as great as the increase in 24 of the 45 states outside the District. It was, however, slightly below the national gain of 5%. For the District as a whole, per capita income grew by \$80, a shade under the percentage gain for the nation.

sources of income in the District Most income payments in the District continued to be in the form of wage and salary disbursements to employees. This source accounted for more than two-thirds of total income payments and for an even greater proportion of the increase registered in 1959. Property and proprietary income and transfer payments (chiefly pensions and unemployment compensation) provide the remainder.

A breakdown of the 1959 changes by industrial

A breakdown of the 1959 changes by industrial origin underscores the changing character of the District's economy. Income from farming fell by \$217 million, or 15%. This compares with a 13% decline in farm income for the nation as a whole. Every District state showed a decline in income from this source, with proportional reductions ranging from 11% in South Carolina to 22% in Maryland and Virginia. Dollar reductions were heavily concentrated in North Carolina and Virginia, these two states accounting for \$156 million, or nearly three-fourths, of the total decline for the District.

The only other broad industrial sector to show a decline was mining, where wage and salary payments fell by \$7 million. The drop in mining was concentrated in the bituminous coal industry of West Virginia and was a factor in the lagging performance of that state's income. For other District states, mining income actually registered a slight increase.

Contrasting sharply with the behavior of farm

income, wages and salaries paid by manufacturing enterprises grew significantly in each of the five states. The two Carolinas recorded the largest proportional increase in this category—an impressive 13% in each. Gains in Virginia and West Virginia amounted to 10% and 9%, respectively, while Maryland registered a more modest  $4\frac{1}{2}\%$  advance. In every District state, gains from manufacturing salaries and wages alone were at least double the losses in farm income.

In dollar terms, manufacturing payrolls increased most in North Carolina, where the 1959 level was \$203 million above that of 1958. Virginia and South Carolina scored gains of just under \$100 million each, while Maryland and West Virginia payrolls increased by \$58 million and \$52 million, respectively. The 1959 increase in the District of Columbia amounted to \$1 million.

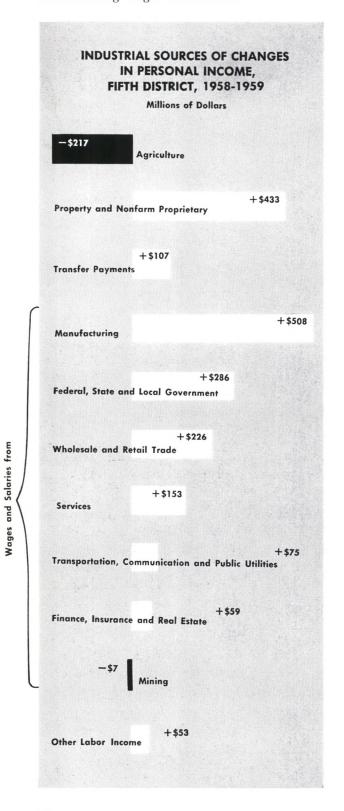
For the District as a whole, wages and salaries in manufacturing rose by 10%, or by over half a billion dollars. This was more than double the loss in farm income and accounted for nearly one-third of the total increase in personal income in the District.

While no other single source of income generated a rise comparable to that in manufacturing, substantial gains were scored in other lines. Wage and salary disbursements of Federal, state, and local governments were up by \$286 million, or 5%. More than half this increase was concentrated in Maryland and Virginia. Property income, including the rental value of owner-occupied homes, rose by \$255 million, roughly 8%. Payrolls in wholesale and retail trade grew at about the same rate, the dollar increase amounting to \$226 million. Increases of over \$100 million each were recorded in contract construction, in expanding service lines, and in transfer payments.

A GOOD GOOD-BYE In summary, respecting the fortunes of the "average" income recipient in the Fifth District—and in the nation—the exit of the decade of the Fifties was quite as auspicious as its arrival. The District's share of the national pie of real purchasing power grew proportionally with the pie, and the gain appears to have been fairly

State	Total Income 1959 (millions)	1	ge from 958 llions)	Percentage Change from 1958	Per Capita Income 1959	Change from 1958	Percentage Change from 1958
District of Columbia	\$ 2,210	+\$	84	+4	\$2,943	+\$93	+3
Maryland	7,108	+	447	+7	2,343	+ 95	+4
Virginia	7,058	+	398	+6	1,816	+ 68	+4
West Virginia	3,053	+	93	+3	1,635	+ 59	+4
North Carolina	6,771	+	453	+7	1,485	+ 79	+6
South Carolina	3,148	+	224	+8	1,332	+ 85	+7
Fifth District	29,348	+	1,699	+6	1,783	+ 80	+41/2
United States	380,664	+	23,122	+6	2,166	+ 97	+5

equally distributed over the states of the District. The postwar changes in relative importance of the various sources of income continued, with the most striking changes in 1959 being the sharp decline in farm income and the impressive increase in manufacturing wages and salaries.



PERSONAL INCOME is the United States Department of Commerce measure of current income payments to persons residing in the United States. It includes some nonmonetary income, such as rental value of owner-occupied homes, as well as money income receipts in the form of wages, salaries, profits of unincorporated businesses, interest, rent, dividends, pensions, unemployment compensation, etc. Persons, as defined in the national income concept, include individuals, non-profit institutions, private trust funds, and private pension, health, and welfare

Personal income is the base from which consumption expenditures, personal savings, and personal tax payments are made. Its behavior over time is, therefore, of great interest to forecasters of these three important economic categories. It is also one of the few measures of over-all economic performance for which statistics are available by states. For this reason, personal income data are frequently used in state and regional comparisons of the level and effectiveness of economic activity.

The Department of Commerce figures, as given in the table accompanying this article, represent personal income before income taxes but after contributions to social insurance have been paid. However, because of the difficulty of allocating contributions to social insurance over the various industrial sources of income, the figures in this article on income by sources represent income before both income taxes and contributions to social insurance. Accordingly, the algebraic sum of the changes in income by sources, as given in the chart on this page, will be greater than the sum of the changes shown in the table. The difference between these sums is \$80 million and represents the increase in personal contributions to social insurance in the Fifth District in 1959.

## the FIFT Hadistrict

The fall season is here and Fifth District businessmen are still confronted by divergent and conflicting signs when they try to evaluate the strength of demand and the course of future business activity. In the District no less than in the nation there have recently been some conflicting developments. Retail sales have lagged; production has been cut back in the District's largest manufacturing industry, the cotton textile mills; and manufacturing employment in general has shown a moderate decline. But construction, except for residential housing, remains at a high level and farm income prospects are good.

The object of consumer spending which is getting the closest scrutiny during this season is the automobile. A sample of Fifth District dealers reporting on the month of August indicated generally satisfactory results from their efforts to clear out 1960 models. About three-quarters of the reporting dealers said that August was as good as or better than July. About two-thirds considered their August sales to be seasonally normal or better. Lenders reported a stronger-than-seasonal rise in the demand for new car loans. New car inventories in August were judged by about three-quarters of these dealers to be within or below a seasonally normal range.

A good majority of dealers also reported a morethan-seasonal gain in used-car sales between July and August. Even though used-car inventories increased between these two months they were, in the judgment of most dealers, not excessive for that time of year.

**RETAIL ROUNDUP** Reports from retailers of appliances and other durable equipment indicate that recent sales have been somewhat below the seasonal norm. Consumer expenditures for services and nondurable goods have continued relatively strong. Developments thus far tend to create the impression that fall trade in the District has started at a level slightly below seasonal expectations. This view gains tangible support from the seasonally adjusted index of District department



Sales of 1961 model automobiles will be watched very closely this year as an indication of the volume of consumer spending.

store sales covering the first three weeks in September. A preliminary estimate of the index shows those sales, seasonally adjusted, down about 1% from the August level, 5% below July, 12% below April, which marked the highest level reached by this index, and 4% below September 1959.

**TOBACCO MARKETS FIRM** Gross returns from Fifth District marketings of flue-cured tobacco through September 23 added up to \$367,867,000.

Compared with last year District tobacco markets this fall have featured a better quality leaf and higher average prices.



This figure is 10% higher than the figure for the comparable period of 1959. This year's prices have averaged \$60.25 per hundred pounds—an increase of 85 cents or more than 1% over last year's average. The volume marketed through September 23 exceeded that of the similar marketing period last year by 8%. In general the higher average prices are a reflection of a better quality leaf than that which was marketed early in the 1959 season. Prices thus far have either held firm or shown some tendency to rise as the marketing season has progressed.

HURRICANE DAMAGE The tropical storm known as Donna did intense damage to crops in areas of the District which lay across her northbound path along the coast. Crop damage in North Carolina alone has been conservatively estimated at almost \$17 million. Damage to forests and farm buildings would also have to be taken into account, and the crop damage figure would probably require an upward revision to reflect fully Donna's impact on the farmers of North Carolina.

The greatest losses through northeastern South Carolina, eastern North Carolina, Virginia and Maryland were caused by injury to the corn crop. Cotton in eastern North Carolina was severely damaged. The harm done to peanut and soybean crops was somewhat less severe. The crop of late vegetables in the Eastern Shore region was hit hard, and much of Maryland's ripening crop of apples was blown to the ground and a considerable number of the heavily laden trees were uprooted.

**EMPLOYMENT REGISTERS NET DECLINE** ally adjusted employment in the manufacturing industries of the District registered a 2% decrease in August. The decline was slightly more pronounced in the durable goods group than in nondurables. Contractions in employment also occurred in mining (down 2.6%), contract construction and the transportation, communication and public utilities group (each down a fraction of a percentage point). Employment in retail and wholesale trade remained virtually unchanged. The remaining major groups (finance, insurance and real estate, services, government) showed minor employment gains. The net effect of these changes was a reduction of about 0.6% in total employment in the District.

All industry groups except mining and non-

durable goods manufacturing showed employment higher than last year. Gains in employment between August 1959 and August 1960 must be interpreted with caution because of last year's steel strike. With the exception of the finance, insurance and real estate category and the services and miscellaneous classification, each of which reached a new high, August employment figures for major industry groups were down somewhat from previous peak levels reached earlier this year.

MANUFACTURING ACTIVITY MIXED August was the third month in a row to show a decrease from the previous month in seasonally adjusted manufacturing man-hours. The decrease from July to August was about 1.6%. The cumulative drop from the year's high in May to August was about 31/4%. Textile man-hours declined about 11/2% between July and August, reflecting production curtailments to avoid inventory build-up as demand for textile mill products continued to lag. Except for occasional order flurries for delivery late this year or early next, the cotton gray goods market is still slow, and apparently in balance in terms of current output and demand. Prices are on the soft side but remain fairly steady. The bright spot in the textile picture is the knitting industry which stepped up its pace between July and August, and is from all reports enjoying strong demand for most products.

The furniture industry declined between July and August on the man-hour scale, but has been more recently reported to be back at a good level of production in response to a fall increase in business of just about seasonal proportions. Among the District's other industries, seasonally adjusted man-hour decreases between July and August were greatest in tobacco manufactures, metals and machinery. Paper and allied products, transportation equipment and the food and kindred products group registered gains.

### PHOTO CREDITS

Cover—West Virginia Agricultural Experiment Station 2. U. S. Department of Agriculture 3. Virginia Agricultural Experiment Station - South Carolina Agricultural Experiment Station 5. North Carolina Agricultural Experiment Station - West Virginia Agricultural Experiment Station 11. Chevrolet Division, General Motors Corporation - Virginia State Chamber of Commerce.