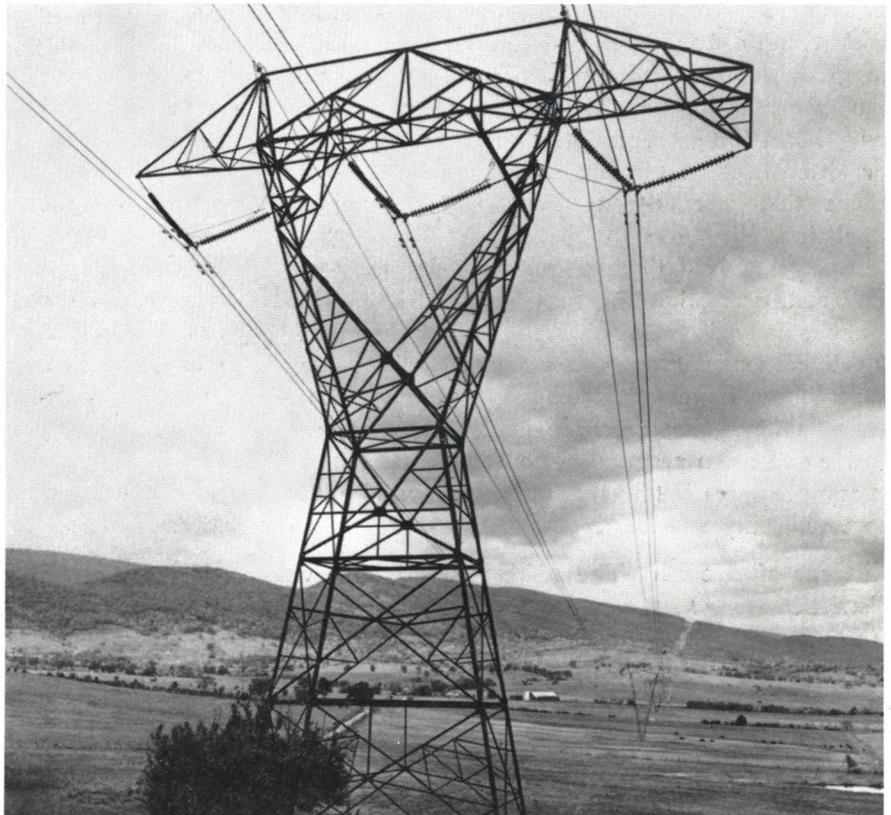


MONTHLY REVIEW



District electric power companies are investing in new, highly productive equipment to keep up with rapidly growing demand.

Developments in District

ELECTRIC ENERGY

Modern man can draw on greater sources of power in an instant than most of his ancestors could command in a lifetime. With no more effort than it takes to flick a switch, he can regulate light, heat and humidity, or activate a variety of devices to enhance his comfort and convenience. Electricity, the versatile energy that makes it all possible, is still a mystery in many ways but has become so commonplace as to be easily taken for granted. Its importance to society was dramatized just a few weeks ago by a power failure that affected one sixth of the nation's population.

Society survived those powerless hours with few permanent scars, but the incident proved that the power supply is vulnerable to accidental failure. Rapid economic growth has contributed to this vulnerability by creating temporary strains. The electric utilities, however, are implementing an extensive expansion program not only to alleviate temporary pressures but to meet long-term needs with more reliability and less cost.

Patterns of Growth The Fifth Federal Reserve District includes some areas that are growing about as fast as any in the country and others which have changed little in recent years. As a result total District population since 1960 has remained a constant 9.3% of the U. S. total. Most economic indicators, however, including electric power output rose faster in the District than in the nation. The number of customers served by the District's electric utilities increased in the past four years from 4.9 million to 5.4 million or from 8.3% to 8.5% of the national total. Other power data showed even more impressive gains. Sales of electric energy, for instance, rose 38% in the District compared to 30% nationally, boosting the District's share of the national total from 8.8% to 9.2%.

Growth patterns in District sales of electric utilities appear in the first of the accompanying charts. Total sales rose from a little over 60 billion kilowatt-hours in 1960 to more than 82 billion in 1964, but composition changed little. The large industrial users have regularly purchased nearly half

of all power sold—39 billion kilowatt-hours in 1963. A significant number of industrial firms operate private generating equipment, and some sell excess output to the utilities. District manufacturing firms generated nearly 10 billion kilowatt-hours in 1963, but this amounted to only one third as much as they purchased.

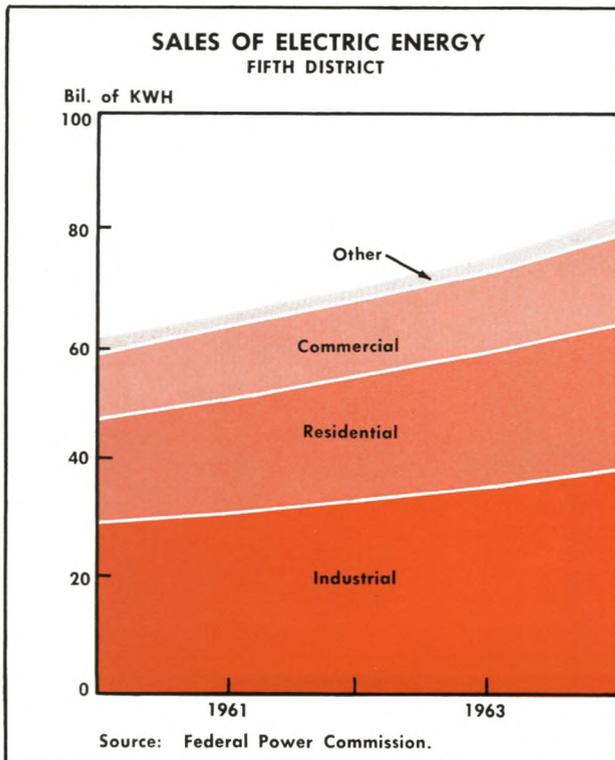
Residential customers consistently accounted for the second largest portion of power sales. They used 25 billion kilowatt-hours last year, a little less than one third of the total. Commercial users, the third major customer group, bought 16 billion kilowatt-hours in 1964, about one fifth of total sales. Among these major consuming groups the residential share has remained about the same since 1960, the commercial fraction has risen slightly and the industrial portion has declined. Other users, including railroads, regularly accounted for the remaining 3% of output.

In contrast to the nation, sales in the District have increased faster than generating capacity, suggesting more intensive utilization of equipment. District companies achieved a 37% sales increase between 1960 and 1964 while expanding capacity 28% compared to a 30% rise in national sales and a 32% addition to generating capacity. As a result the District's share of national capacity declined between 1960 and 1964 while its share of sales increased.

With regard to the Federal Government's role in electric power production, the District contrasts strongly with the nation as a whole. Between 1960 and 1964 the power industry nationally added 53.6 million kilowatts to total generating capacity of which more than one fourth, some 14.5 million kilowatts, was built with Government funds. In the Fifth District, on the other hand, 4.5 million kilowatts of new capacity were added during the four-year period with only about 50,000 kilowatts, little more than 1%, in the public sector. Private capacity grew as fast in the Fifth District as in the nation between 1960 and 1964 (about 30%) but Government-owned capacity rose 37% nationally compared to only about 3% locally.

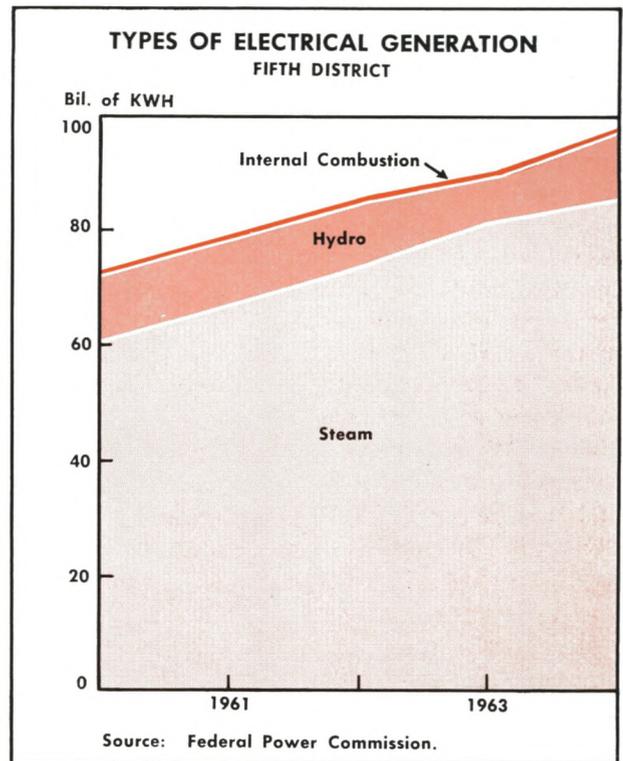
Types of Generation Steam continues to provide most of the force to keep generator armatures spinning, and coal remains the principal fuel. Efforts to reduce coal costs have led to some important new ideas. Generating plants have usually been built close to market areas. Construction costs were lower, coal could be hauled over existing rail lines, and transmission to nearby markets posed no problems. Hauling the coal, however, has continued to be a substantial item of cost, even though the railroads have achieved considerable savings with special equipment, including "unit" or "integral" trains, which can haul as much as 35,000 tons per trip right from the mine to the plant. Theoretically the cost of power could be reduced by locating a large steam-powered generating station where coal reserves were known to be adequate, then transmitting the output to centers of heavy demand over extra-high-voltage lines.

Site for New Plant Over 40 sites in the District's northwestern quadrant were investigated as possible locations for such a new kind of plant. The main criteria were: (1) adequate and available but as yet undeveloped coal reserves at or near the site, (2) topography and a river suitable for building a dam to create a cooling pond large enough to accommodate a one-million-kilowatt plant, (3) reasonable nearness to major power consuming centers.



These factors led to the selection of a valley near Mt. Storm, West Virginia.

To realize additional economies, two identical generating units were designed, each with a capacity of 570,000 kilowatts, and the first was ready on schedule to begin operations last spring. Construction of the plant, the dam, roads and railroads all went smoothly. The 500,000-volt transmission system, however, encountered unanticipated difficulties that are currently being ironed out. Production is expected to expand to planned levels in the near future.



Bigger Share for Coal The Mt. Storm installation may set a pattern that will secure for coal an even larger share of the electric utility industry's voracious appetite for fuel. Western power companies are reported to be studying undeveloped coal fields in the Southern Rockies as potential sites for generating plants to supply burgeoning urban areas of the Far West, but the scarcity of water could be a problem. Some indication of the availability of low-cost coal in these western areas may be gained from comparative figures. The average cost of a ton of coal to eastern utility companies in 1964 (transportation included) ranged from around \$10 in northern New England to about \$4 in coal-mining states. In most eastern states the cost was between \$7 and \$8. By

contrast, the cost per ton was under \$3 in several Rocky Mountain states.

Coal's recent contribution to power generation can be roughly visualized with the aid of the second chart. Steam-driven generators produce nearly seven eighths of the District's electric power. Ninety-six per cent of this so-called thermal electric energy is derived from coal. Gas fueled most of the remaining 4%, but oil was also used, while only about one million of the District's 85 billion kilowatt-hours of thermal power were produced with nuclear fuel.

Generating plants in the District have regularly produced more power than District markets could absorb; and the excess has been exported to neighboring states. These exports account for the differences between sales and generation as shown in the charts on page 3. About 15% of the electric power generated in the District in 1964 was consumed elsewhere.

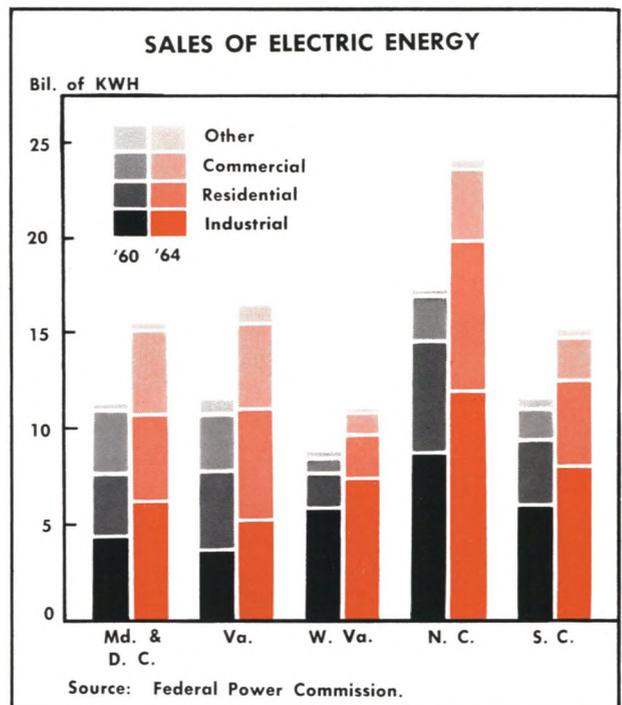
Steam accounts for four fifths of the national power supply with oil, gas, and nuclear fuel considerably more important than in the District. Less than two thirds of the nation's thermal power comes from coal, more than one fourth from gas, and most of the remainder from oil. Nuclear fuel produced some 3.3 billion kilowatt-hours of power nationally in 1964 when the total power output exceeded 806 billion. Water power is also of greater significance nationally and increased about one fifth between 1960 and 1964 but, as in the District, its share of the total declined. Quantities of power so small that they hardly show up on the graph were produced with internal combustion equipment in both the District and the nation.

Local Patterns Growth since 1960 has displayed considerable variation among District states. Maryland at the start of the decade had approximately 2 million kilowatts of generating capacity and added over 1.2 million kilowatts in four years. In the same period Virginia added 1.4 million, and North Carolina 1.6 million, more than a one-third increase in each case. Capacity rose one fifth in South Carolina, increased slightly in the District of Columbia, but declined in West Virginia. Most of the new capacity was steam powered, although large hydroelectric projects have recently been completed in North Carolina and Maryland and are under construction in Virginia. Nearly one third of recent additions to capacity in North Carolina and one fifth in Maryland have been hydroelectric.

Power sales in 1960 and 1964 in the various states of the District are shown in the third of the accompanying charts. The fastest growth occurred in

Virginia where sales jumped 44% in the four-year period; but North Carolina was close behind with a 39% gain followed by Maryland and the District of Columbia, 37%; South Carolina, 33%; and West Virginia, 27%. Sales to commercial customers grew most rapidly in all parts of the District except in Maryland, where industrial consumers set the pace. The largest increase of all major customer groups occurred in North Carolina where commercial users increased power consumption 54%.

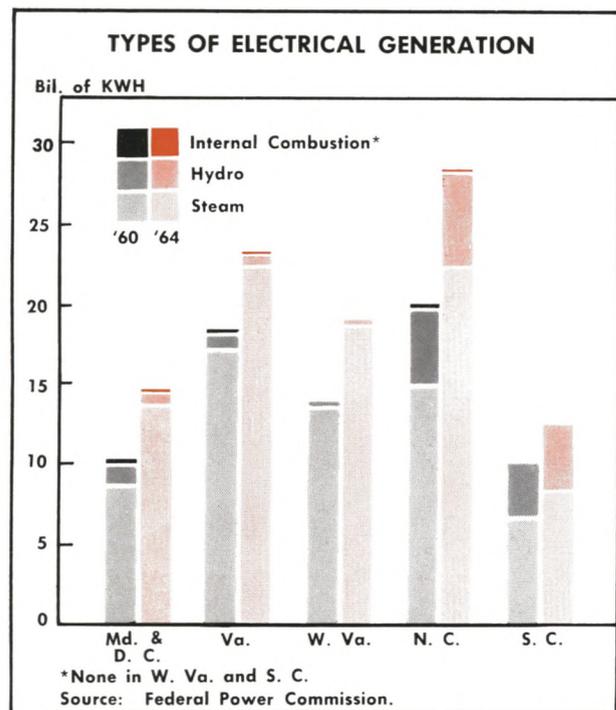
The relationship of power sales to population does not appear in the charts. Total power consumed per capita in the Fifth District in 1964 was about 4,600 kilowatt-hours, just under the national average. Variation among the states, however, was considerable with West Virginia at the top of the list with 6,079 kilowatt-hours per capita followed by South Carolina, 6,040; North Carolina, 4,936;



Virginia, 3,807; and the Maryland-District of Columbia area, 3,680. The figures are slightly misleading because private generation by industrial firms was more important in some states than in others. Adjusting the data accordingly, however, would probably not affect their order. The big power-using industries were primary metals in Maryland and West Virginia; chemicals in Virginia, West Virginia, and South Carolina; and textiles in both Carolinas.

Residential sales per capita provide a somewhat

more comparable set of figures. For the nation, residential sales per capita in 1964 were 1,414 kilowatt-hours. The District figure was 1,395, about 1% below the national. Within the District, South Carolina headed the list with an impressive 1,775 followed by North Carolina, 1,620; Virginia, 1,331; West Virginia, 1,218; and Maryland combined with Washington, D. C., 1,053. The lowest figure undoubtedly reflects a large population living under more crowded conditions than generally exist elsewhere in the District.



Use Patterns To show what can happen in a fast-growing sector, the number of space heating and heat pump installations in the area served by a single Fifth District company considerably more than tripled between 1960 and 1964. According to the 1960 *Census of Housing*, about 28,500 District homes were then heated by electricity. Since 1960 electric home heating installations in the market area served by just one company have numbered one and a half times those existing five years ago in the entire District.

Average growth has been more moderate but still impressive. Electric power consumed by all types of customers throughout the nation rose one fifth between 1960 and 1964. Residential customers increased power usage more than one fifth. The average commercial customer consumed over 25,000 kilowatt-hours in 1964, up nearly 50% from the 1960

level. Among large power consumers, which included heavy industrial users, municipalities, and railroads, power use averaged nearly 700,000 kilowatt-hours in 1964, one fifth greater than four years earlier.

Prices and Costs As use has increased, the price of power has steadily declined. Average revenue per kilowatt-hour sold to residential consumers across the nation was 2.7 cents ten years ago, 2.5 cents in 1960, and 2.3 cents in 1964. The price to commercial users declined from 2.5 cents in 1960 to 2.2 cents in 1964. Large industrial users, because of the large amounts consumed, bought their power at an average price of 0.97 cents per kilowatt-hour in 1960 and 0.91 cents in 1964. The average price of power to all classes of customers combined dropped from 1.77 cents ten years ago to 1.62 cents in 1964.

As plants have increased in size, cost relative to output has declined. Cost per kilowatt of installed capacity in conventional steam plants built during the past decade by the company responsible for the Mt. Storm installation declined from around \$145 in the mid-1950's to about \$120 in 1960 and \$104 in 1962. Estimated cost per kilowatt of installed capacity at Mt. Storm is \$98, including the cost of the extra facilities such as the dam and reservoir, coal roads and railroads, and 17,000 acres of land and mineral rights.

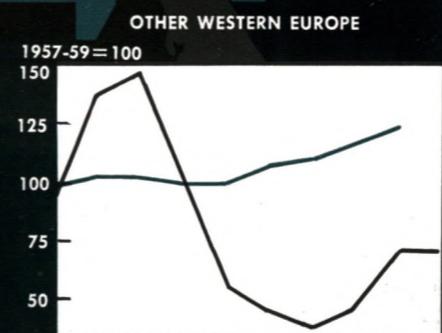
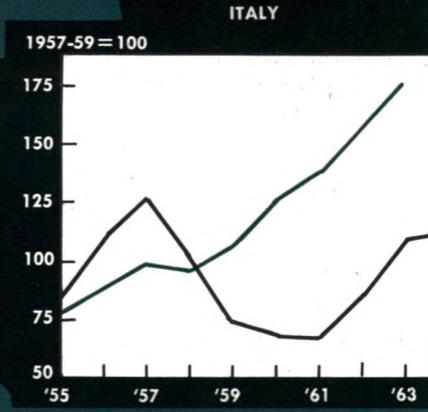
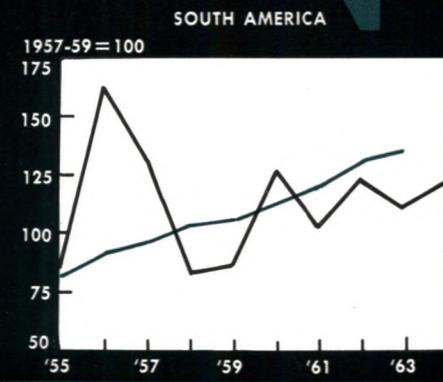
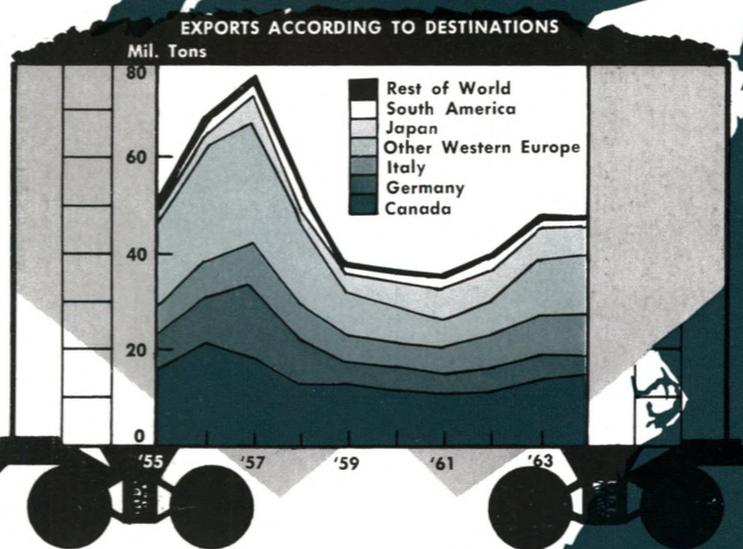
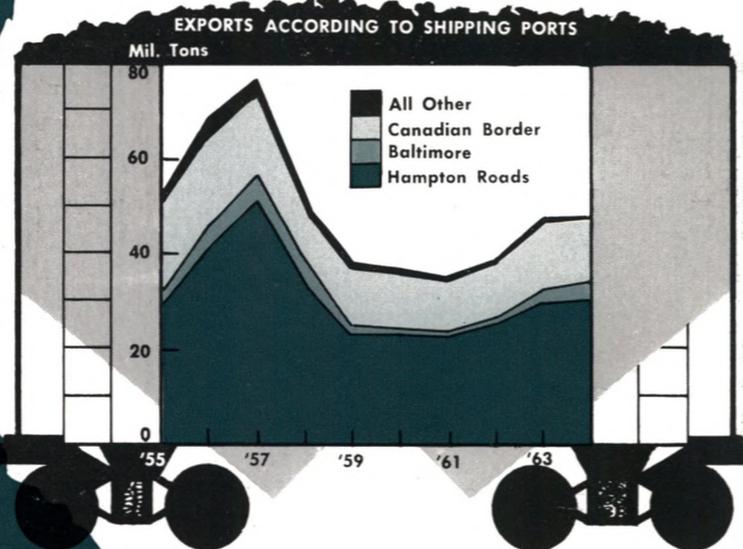
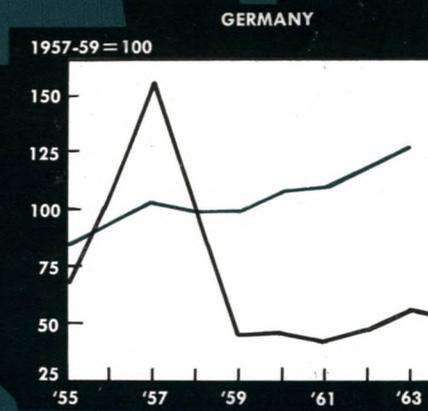
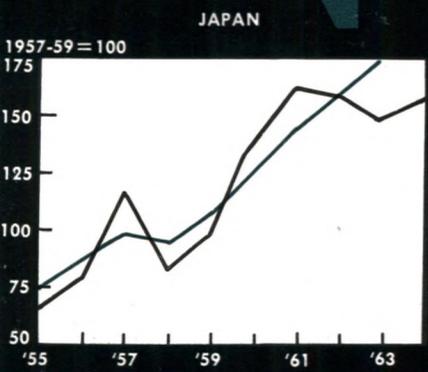
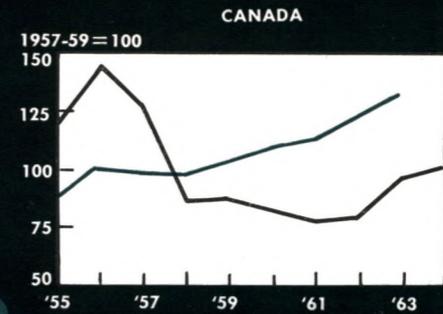
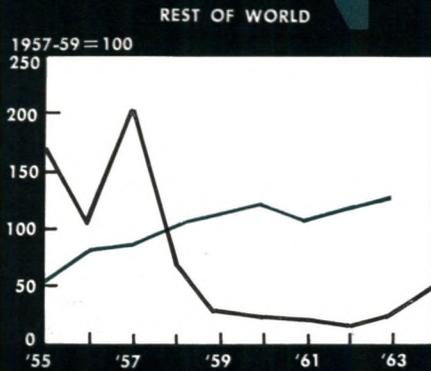
All types of generating equipment currently in use can operate competitively if production and marketing conditions are favorable. Under the right circumstances, for instance, nuclear fuel can compete with natural fuels in steam plants. The recent structure of the District's power generation, shown in the final chart, has established some firm trends. Hydroelectric generation declined between 1960 and 1964 in Virginia and Maryland, remained substantially unchanged in West Virginia and rose in the Carolinas. Steam generation rose sharply in all states. Indications are that both hydro and steam power will increase in volume as demand surges upward in the years ahead. As for nuclear-generated electric power, the Federal Power Commission indicated in its 1964 *Annual Report* that substantial reductions are anticipated within a decade in the cost of operating nuclear-powered generating equipment. The report also said that by 1980 nuclear generation may provide the lowest-cost power in many locations and may account for 13% of national output. The Fifth District, endowed by nature with both coal and potential water power, now has only one nuclear plant, jointly operated at Parr, South Carolina by several District companies.

U. S. BITUMINOUS COAL EXPORTS

In the past ten years the United States produced more than 4.4 billion tons of bituminous coal and shipped almost half a billion tons to other countries. Seventy per cent of these exports moved through the Fifth District ports of Hampton Roads and Baltimore, while most of the remaining 30% was shipped through Great Lakes ports to Canada. Changes in the volume of bituminous coal exported through principal shipping points are shown below in the chart on the left.

The chart on the right shows the same yearly total distributed among principal importing countries. More than half of all U. S. coal exports over the ten-year period went to the nations of Western Europe, led by Germany and Italy. Canada received three tenths of our exports between 1955 and 1964 while Japan took a little more than one tenth. South American countries constituted our next most important foreign coal market but accounted for only 4% of the ten-year total.

The seven smaller charts show trends in the importance of U. S. coal compared to total energy consumed in the principal foreign markets. The usual pattern is one of recently rising imports following earlier declines. For most countries U. S. coal is generally less important now than it was ten years ago. Canada now obtains about one tenth of all its energy from U. S. coal in contrast to one fifth in the mid-1950's. Italy depended on U. S. coal in 1956 and 1957 for over 17% of its energy supply but for less than 9% in 1963. U. S. coal accounted for 7% of Germany's energy consumed in 1957 but only 2% in 1963. In the latter year American coal provided 4% of Japan's total energy consumption, about the same as ten years ago after exceeding this level in most years from 1957 to 1962.



Imports from United States
Total Energy Consumed

Source: U. S. Department of Commerce and United Nations



Junior Colleges

One of the most important trends in twentieth century American education is the rapid growth of the junior college. In 1900, there were only eight junior colleges in the United States; by 1964, the number had increased to 719. The concurrent rise in the junior college enrollment can only be described as spectacular. Amounting to less than one hundred students at the turn of the century, the total now exceeds one million.

The progress of the junior college movement has been particularly impressive during the most recent five-year period. New junior colleges have been established at a rate of about 30 a year, and total enrollment has increased annually by approximately 67,000.

General Characteristics The term "junior college" denotes any institution of higher learning which offers two years of education beyond the high school level. Individual institutions may not use the word "junior" in their titles, but may instead call themselves community colleges, city colleges, technical institutes, or simply colleges.

The American junior college movement began in the late 1800's as part of a broad educational reform effort. A number of leading educators of that day advocated the separation of four-year colleges into lower and upper divisions, the former concentrating on the completion of a general, liberal education and the latter offering more advanced studies. In 1890, the University of Chicago established the first such two-year liberal arts program. The idea of the junior college quickly gained wide acceptance and, by 1920, there were 200 such institutions in operation, most offering liberal arts programs patterned after the Chicago prototype.

The first important change in the concept of the nature of a junior college took place in the mid-1920's with the establishment of a number of two-year colleges specializing in vocational and adult education. The founders of those institutions saw, even then, that an increasingly complex society with continuously advancing science and technology created the need for institutions which could develop salable technical

skills for those who lacked the means or the inclinations to complete a four-year college program. The Great Depression and, later, World War II slowed the general growth of the junior college movement. After 1945, the two-year institutions began to spring up in cities all over the nation, especially on the Eastern Seaboard and in the Far West. There was an especially rapid increase in the numbers of community junior colleges concentrating upon programs leading to employment in particular occupations. Often the programs varied with the geographical location of the institution. In the Midwest, where so many local economies are tied to agriculture, a number of schools came into being offering training for technicians in agricultural research. In Texas, one community college started with a program in petroleum technology.

The overwhelming majority of the early junior colleges were private institutions, either church-related or independently endowed. Today, however, institutions supported by public funds have all but pre-empted the field. Almost nine tenths of the junior college students enrolled at the beginning of the 1964-65 school year attended institutions supported primarily by state or municipal funds. Two separate causes have contributed to this transition. First, three of every four junior colleges established in the period 1960 through 1964 were publicly-supported schools. Second, during the same time span, 40 private junior colleges expanded their programs to become full-fledged senior institutions.

Among the public institutions, roughly four fifths are community colleges, locally controlled and supported by both municipal and state funds. The others are either extensions of state universities or separate schools controlled and supported entirely by state governments.

Junior College Programs The course requirements at junior colleges specializing in the liberal arts programs are similar to the freshman and sophomore year requirements at most four-year colleges. The important difference is in the composition of first-year work. The junior college normally offers

certain basic courses at the remedial level in order to give special help to the student who, for one reason or another, has an inadequate high school background. Most four-year schools no longer offer such courses.

Those students who earn good grades ("C" or better) in liberal arts junior colleges have little trouble gaining admission to four-year schools. In fact, since many schools have small junior classes due to dropouts, transfer, etc., it is sometimes easier to gain admission at the end of the sophomore year than as a freshman. Studies show that transfer students generally do as well in four-year colleges as those who entered the colleges as freshmen.

The requirements for a two-year vocational course of study in a junior college are all related to preparation for a specific occupation and combine classroom study with on-the-job training. Students interested in vocational programs can choose training in a number of "middle-level" occupations in technical, sales, and other work. Much stress is placed on training of technicians needed to back up scientists, engineers, physicians, dentists, and other professionals. It has been estimated that United States in-

dustry requires some 70,000 new technicians each year, while only about one half that number are now available. Business related courses are also offered which train students for such occupations as book-keeper, legal secretary, library assistant, insurance salesman, data programmer, graphic-arts technician, and department store manager.

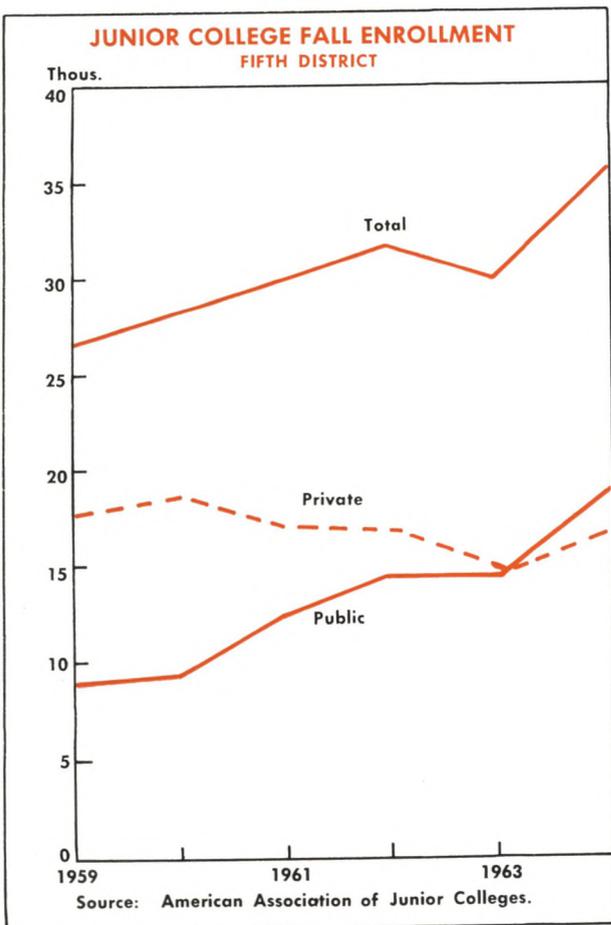
Like his counterpart who completes a liberal

**Average Tuition and Fees
at U. S. Institutions of Higher Education*
1963-1964**

	<u>Public</u>	<u>Private</u>
	(\$)	(\$)
Universities	268	1,200
Liberal arts colleges	185	807
Teachers colleges	227	650
Technological schools	250	1,151
Junior colleges	128	526

*Averages per full-time undergraduate student, entire academic year.

Source: U. S. Department of Health, Education, and Welfare.



arts junior college program, the technically-trained graduate generally finds the future much brighter than it would have been without the additional training. In recent years, technicians of all types have been so much in demand that it has not been unusual for 90% or more of those who complete technical programs to have jobs waiting on graduation day.

The Special Role of the Junior College The success of the American junior college stems from the fact that they meet several educational needs in our society. Since junior colleges are located in close proximity to the students, they minimize the costs of college education and make it possible for more students to attend college. The table on this page compares average annual tuition costs at various types of institutions of higher learning during the 1963-64 school year. It may be seen that the average costs at junior colleges were less than half those at universities. The two-year schools also extend educational opportunity by giving "late bloomers" a chance to remedy academic deficiencies.

Generally speaking, these schools have demonstrated a highly desirable flexibility in arranging

their curriculum offerings. Many offer special classes for those seeking to update occupational skills and conduct late afternoon and evening programs that make it possible for full-time jobholders to attend the programs.

Fifth District Junior Colleges Fifth District junior colleges at the beginning of the 1964 fall term numbered 65. Forty of these colleges were privately supported; 25 publicly supported. The table below shows the distribution of Fifth District junior colleges by state.

The number of junior colleges in the District in

	<u>Number of Junior Colleges</u>		
	<u>Total</u>	<u>Public</u>	<u>Private</u>
Fifth District	65	25	40
District of Columbia	3	0	3
Maryland	17	12	5
North Carolina	19	5	14
South Carolina	6	0	6
Virginia	17	7	10
West Virginia	3	1	2

Source: American Association of Junior Colleges.

1964 was roughly the same as ten years ago. Yet the makeup of the junior college community underwent substantial change over this period. Many junior colleges have become four-year institutions and numerous new ones have been established. Of the 65 two-year colleges located in the District, 22 (16 public and 6 private) have been established in the last ten years. Nine of these are in Maryland, seven in Virginia, four in North Carolina, and two in South Carolina.

Enrollment in the District's junior colleges, at 35,600 in the fall of 1964, was up 32% from the 1959 level. As shown in the chart on page 9, enrollment has risen every year since 1959 except for 1963. The decline in 1963 was associated with the closing of two junior colleges and the conversion of three others to senior institutions.

Public junior colleges have grown more rapidly than their private counterparts in recent years. Enrollment of public institutions more than doubled in

the period, 1959-1964, increasing from 9,300 to 18,900. More than half the District's junior college students in the latter year were enrolled in public institutions.

Private junior colleges have declined both in number and enrollment. In 1959, enrollment at private colleges totaled about 17,800 and amounted to more than twice that of the public college enrollment. By 1964 enrollment in these private institutions had decreased to 16,800 and represented only about 34% of the total. Conversion of private two-year colleges to senior status accounted for most of this decline.

Prospects for the Future The junior college has become a permanent part of our system of higher education. One student in every four entering United States colleges during 1964 enrolled in a junior college. Moreover, indications are that the two-year schools will become even more important in the years ahead.

Technological advance may be expected to bring a continuous upgrading of the skill requirements for jobs in every sector of the economy. It is estimated that, within five years, two thirds of all jobs will call for some college training. This will mean, of course, that more and more young people will be seeking admission to institutions of higher learning, putting considerable strain on existing facilities.

The establishment of more community junior colleges appears to be the best available single answer to this rapidly growing need for additional educational opportunities. The expense involved in beginning a new community college operation is appreciably less than that of starting a new four-year school. Also, as pointed up above, the program of the two-year school can be directed toward the needs of the particular local economy and the training can be made available at a cost within the reach of almost all of those desiring it.

Increasingly, the advantages of the junior college are being recognized. In the past several years, a number of state legislatures have appropriated funds for statewide community college systems. The Higher Education Act of 1965, passed by Congress in October, provides specifically for grants to junior colleges to improve academic standards. Some of the nation's leading educators are now proposing that the system of free public education be expanded to 14 years instead of the current 12.

In short, the major problem for the American Junior College Movement in the near-term future will be that of keeping pace with the expanding demand for the educational services that the two-year schools can provide.

THE FIFTH DISTRICT



THE PAPER INDUSTRY—A SKETCH

The paper industry is one of the most dynamic elements in the rapid expansion of Fifth District manufacturing. The challenge of a growing market has been met with new products, new plants, and new production techniques. The industry is still relatively small, with production of pulp, paper, and allied products accounting for only about 4% of total value added by manufacture in this five-state area. The comparable fractions for the textiles and chemicals industries are 18% and 15%, respectively. Not too many years hence, however, paper production may well be one of our area's top three or four manufacturing activities.

The Present Situation There are some 300 manu-

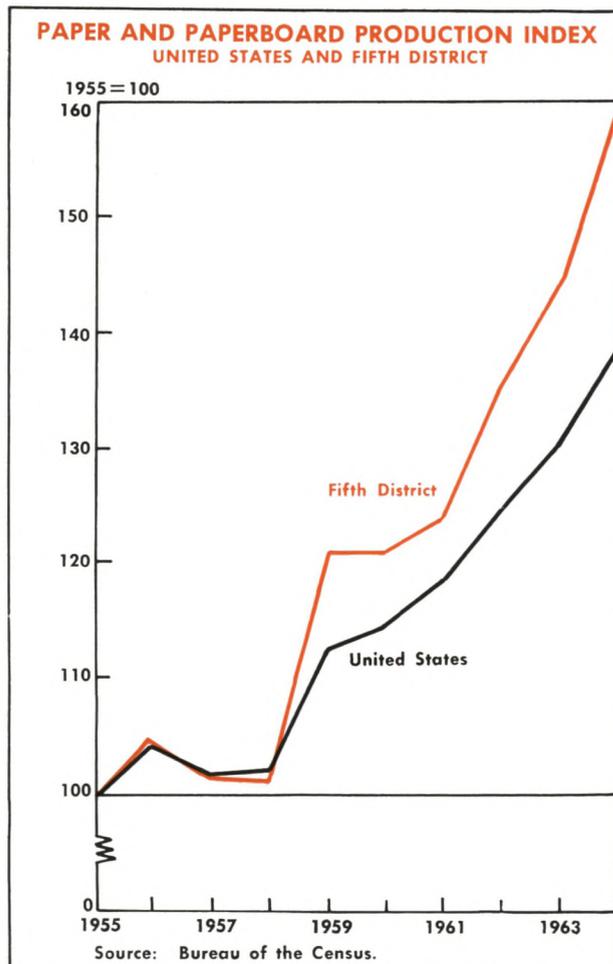
facturers of paper, paperboard, and allied products in the Fifth District today. Total value added by these plants amounts to over \$600 million annually. Only 41 of the establishments are mills making basic paper. All the others, except a few pulp mills, are converter plants of various types, producing almost 200 different paper products. Notably absent from the list of products, however, is any significant quantity of fine writing and printing paper, newsprint, or tissue. Production of the finer white papers is relatively expensive because the production process requires clear water, which can be obtained in sufficient quantities in this area only by filtering. Most of the basic paper made is of the coarse brown variety, a large portion of which goes into the manufacture of corrugated boxes.

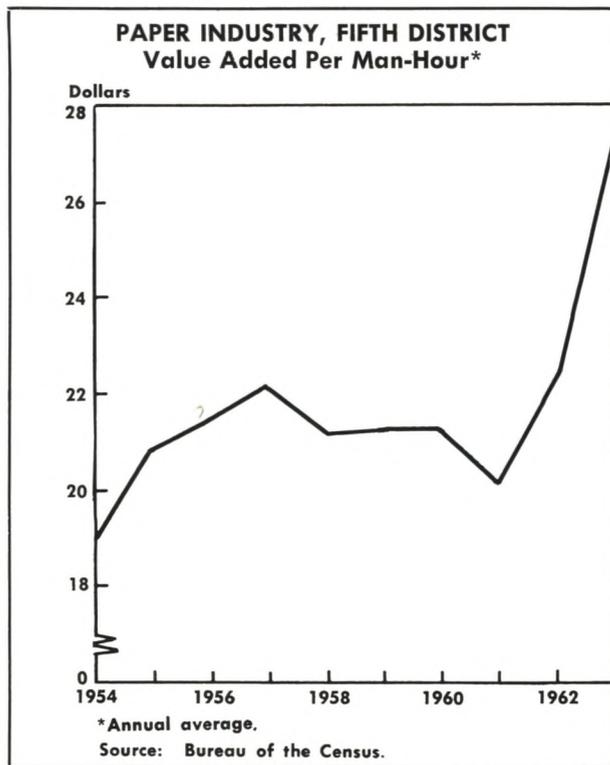
The output of mills in the two Carolinas and Virginia accounts for nine tenths of the basic paper production in the District. The manufacture of products from basic paper—the converter activity—is more evenly distributed geographically. The same three states are the leaders, but Maryland also accounts for a significant fraction of total output. In West Virginia's industrial structure, no stage of paper production is important.

The paper industry is not one of the District's major employers. The production of basic paper and paper products requires heavy capital investment, but relatively few men. As of the end of last year, only about 45 thousand of the 1.5 million employees of manufacturing firms in our five states and the District of Columbia worked for firms making paper products. Those employed in the industry are relatively well paid. Last year, the average hourly wage for a production worker in paper and pulp was \$2.53, compared with an average of \$2.04 for all manufacturing production workers in our area.

Growth in Recent Years From an output level of 3.1 million tons of paper and paperboard in 1955, total production of Fifth District firms climbed to 5 million tons last year, a gain of 58%. It may be seen in the chart on this page that, since 1958, production has risen more rapidly in the District than in the nation as a whole.

The recent expansion of production at mills and





plants has been made possible by a substantial increase in capacity. In the last decade, total annual new capital expenditures have more than doubled, climbing from roughly \$30 million to almost \$80 million. Even so, most producers ended last year pushing against the ceiling of practical capacity.

Employment has risen since 1955, but less than in proportion to the increase in production. The total gain in number of jobs has been only about 30% as the introduction of new techniques and machinery has increased output per man-hour and thereby reduced the number of men needed in most production operations. The chart on this page shows that Fifth District firms have been particularly successful in raising productivity (value added per man-hour) during the last several years.

The gains in output per worker have made possible appreciable increases in wages, without higher paper product prices. Between 1958 and 1964, the average wage of production employees rose by 22% while the wholesale price index for paper and allied products declined 1%. Also contributing to the maintenance of product price stability has been an intensely competitive situation among firms within the industry and the threat of competition from various plastic products.

The profit records of firms making basic paper and paper products have been good in recent years. For the nationwide industry, profits as a fraction of

sales have been very close to and have generally moved with the national average for all manufacturing industries. Like most averages, however, the average rate of profit for the paper industry conceals almost as much as it conveys. Firms which have introduced the newest technical processes have done much better, and a number of these more progressive firms are located in our area.

The Future Generally, the outlook for the paper industry appears bright. The demand for paper and paper products may be expected to be increasingly strong. There is the prospect of expanded sales of paper for "traditional" uses. The "knowledge explosion," both on and off campuses, is providing a market for an ever increasing volume of paper for books. Each year, private businesses and government are using more and more paper for reporting forms and correspondence. For many uses, paperboard boxes have almost completely replaced their wooden counterparts. Equally if not more important, new uses for paper are being discovered every day. To cite two extreme examples, disposable paper clothing and furniture (only chairs at the moment) are no longer ideas for some time in the future; the products are realities. Most important quantitatively, there appears to be no technical limit to the use of paper for packaging.

There are reasons to believe that the lion's share of the industry's growth in the face of expanding demand will take place in Fifth District states and in other states further south. Labor rates and pulpwood prices are low relative to those in other sections of the country, and in most parts of the District, lower-cost open plant construction is feasible, due to the mild climate. These advantages have existed for years, but until recently meant less than they might have since for the most part the hard-to-bleach fibers of southern pine could be used only for the production of coarser brown papers for bags and boxes. In the last several years, however, processes for the conversion into pulp and bleaching of pine fibers have been improved. Also, there has been significant progress in the utilization of hardwood. Pulpwood from various types of southern timber can now be used for almost any paper product. Thus it would appear that, in years to come, the growth of the industry in this area will be limited only by the demand for paper and paper products of all types in a national market.

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