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THE NATURAL GAS INDUSTRY OF THE SOUTHWEST AND ITS SIGNIFICANCE TO INDUSTRIAL DEVELOPMENT

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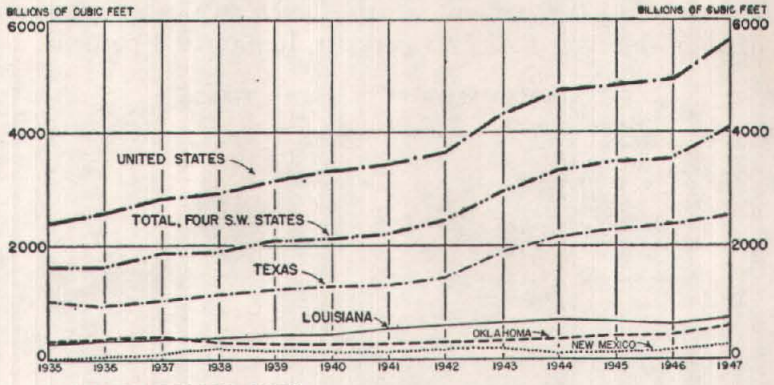
Natural gas has contributed significantly to the industrial development of the Southwest and should play an important part in the further growth and diversification of industry within the region. The area has over four-fifths of the Nation's reserves of this ideal fuel and important raw material, and southwestern wells supply nearly three-fourths of the total national production. Natural gas has been increasingly sought as a fuel because of its cleanliness, the high temperatures obtainable, the ready control of its flow and rate of burning, the lack of need for storage, and its cheapness compared to most other fuels. As a raw material, natural gas is a source of helium, carbon black, natural gasoline, butane, propane, kerosene, and numerous chemical and other products. The conservation of this resource, its utilization within this area and elsewhere, and the extent of its potential contribution to the industry of the area are of important concern to the economy of the Southwest.

Natural gas has been used to some extent in the Old World for more than 2,000 years and was used for lighting purposes in the United States more than a century ago, but commercial utilization did not begin until 1872. In the subsequent half-century there was a steadily upward trend in production, but the major expansion has occurred since the early 1920's. In the early days of the natural gas industry in the United States, Pennsylvania, West Virginia, and Ohio were the leading producers, but the opening of the mid-continent oil and gas fields saw Kansas, then Oklahoma, and shortly thereafter Louisiana and Texas far surpass the older states. Texas has led all states in natural gas production since 1929 and now produces close to half of the total output of the Nation.

NATURAL GAS PRODUCTION, 1935-47
EXCLUDING AMOUNTS RETURNED TO FORMATION



SOURCES: UNITED STATES BUREAU OF MINES
AMERICAN GAS ASSOCIATION

Through the years, the growth in natural gas production has been linked closely with the expansion of the petroleum industry. The underground reservoirs of crude petroleum contain varying amounts of natural gas, which are recovered simultaneously with the production of crude petroleum. In fact, the amount of gas in a reservoir may influence considerably the cost of producing crude petroleum and, also, may determine the amount of crude oil ultimately to be recovered from a specific reservoir. Moreover, since the geological formations of reservoirs of crude petroleum and of natural gas are similar, drilling for oil often leads to the discovery of a gas field.

While the technological improvements in methods of drilling wells and in pipe-line transportation have been developed chiefly by the petroleum industry, they have been made available almost simultaneously to the gas industry. The development of petroleum reservoir engineering, which has increased the attention being given to the importance of natural gas in the ultimate recovery of oil, has emphasized the need for the conservation of gas and for the maintenance of gas pressures in underground oil reservoirs. At the same time, research has yielded increasingly efficient processes for extracting the natural gas liquids from the wet gas produced chiefly as a by-product of crude oil production. Such research not only has made possible the rapid increase in production of these natural gas liquids to meet the expanding demands for petroleum products but also has led to extension of the practice of returning the dry gas to the underground reservoirs as a means of maintaining pressure. Thus, the growth of the gas industry has been and will continue to be dependent in a large measure upon the petroleum industry. At the same time, it should be recognized that with the increasing uses of and the expanding markets for natural gas and its derivatives, the natural gas industry in the future gradually should acquire a more independent status.

Despite the almost continuous rise of production in the United States, estimated proved reserves of natural gas have increased to many times earlier levels. The newly discovered reserves almost every year have exceeded considerably the total utilization for the year, so it is apparent that presently known reserves only partially indicate future gas supplies. Not only have proved reserves been increasing, but an ever larger proportion of the reserves is being found in the Southwest. The once dominant Northeast now has only 2 percent of the Nation's total gas reserves, as compared to 80 percent in the Southwest. No less than 55 percent of the Nation's reserves are in Texas, with Louisiana having 14 percent, Oklahoma 7 percent, and New Mexico 4 percent.

TABLE I

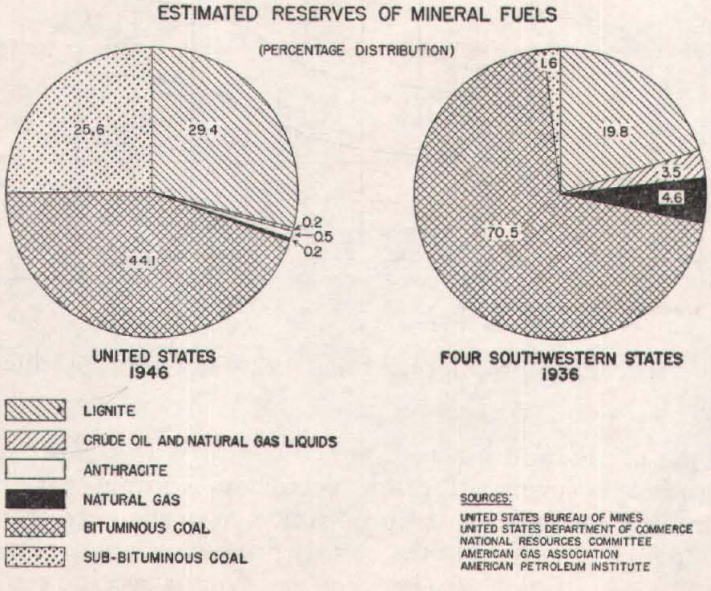
ESTIMATES OF PROVED RECOVERABLE RESERVES OF NATURAL GAS IN THE UNITED STATES, 1925-48

(In trillions of cubic feet)

End of year	Estimate of reserves
1925	23.0
1930	46.0
1934	62.0
1937	66.0
1938	70.0
1940	85.0
1941	113.8
1942	110.0
1943	110.0
1944	133.5
1945	147.8
1946	160.6
1947	165.9
1948	175.2

SOURCES: Petroleum Administration for War. American Gas Association. *Oil and Gas Journal.*

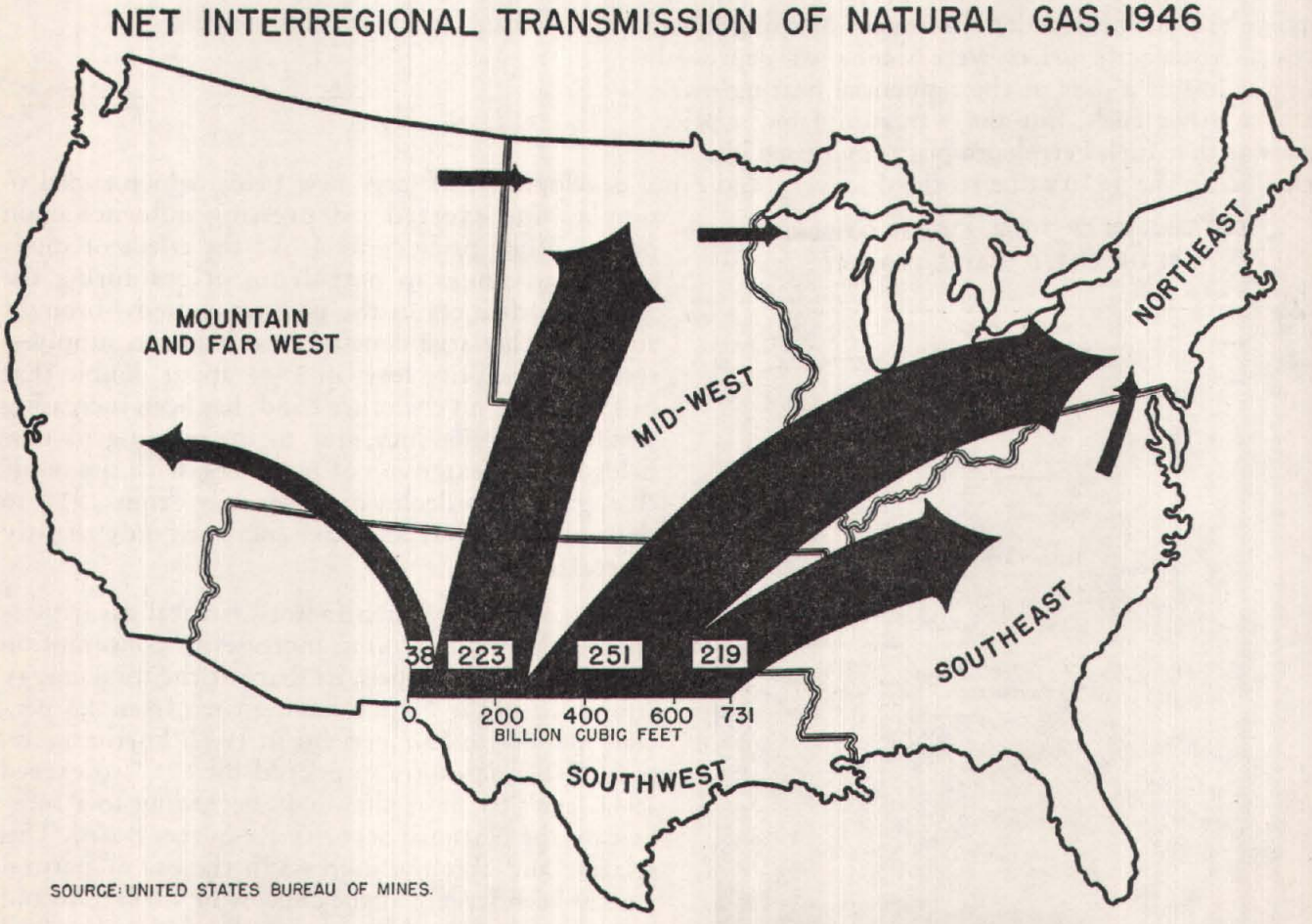
Although tremendous amounts of natural gas reserves have been discovered, it should be observed that they are very small in relation to reserves of other mineral fuels, measured in terms of heat equivalents. In the United States the estimated proved reserves of natural gas amount to only 0.2 percent of the reserves of all mineral fuels; and in the Southwest, where natural gas is particularly important, only 4.6 percent. In the latter area other mineral fuels account for the following percentages of total reserves: coal 72.1 percent, lignite 19.8 percent, crude oil 3 percent, and natural gas liquids 0.5 percent. While natural gas reserves in the Southwest appear sufficiently large to meet requirements for a long period in the future, the rapid expansion of production and consumption emphasizes the desirability of maintaining a high rate of current discovery and of using every available means of conserving existing supplies.



While the greatest increases in natural gas reserves and in production have occurred in the Southwest, an actual or potential market for natural gas is to be found in virtually all sections of the country. This situation is important to the industry because the capacity to produce natural gas in the Southwest far exceeds the consumption capacity of the area under existing conditions. In more recent years the large populations of major cities, particularly in the mid-western and eastern portions of the country, have provided outlets for increasing amounts of gas, and this demand is expected to increase further in the next few years.

The marketing of natural gas both within and outside the Southwest has depended upon the ability of the industry to construct pipe lines so that the gas can be transported satisfactorily at a reasonable cost. The low cost of natural gas and the increasing assurance of reserves sufficient for at least several decades have been important economic factors in the spread of the pipe-line networks. The rapid growth of the natural gas industry during the 1920's also was facilitated by the introduction of ditch-digging machinery and electrically welded, seamless pipe. Such developments permitted the industry to change from a regional to a national basis. Since 1931, nearly 60,000 miles of long-distance natural gas pipe lines have been laid. In 1947, the change-over of the wartime Big Inch and Little Inch petroleum pipe lines to natural gas transmission initiated a postwar period of rapid expansion. Longer and larger pipe lines have been constructed or authorized, some of them 31 inches in diameter. Practically all such large pipe lines originate in the Southwest and terminate in large consuming centers from coast to coast.

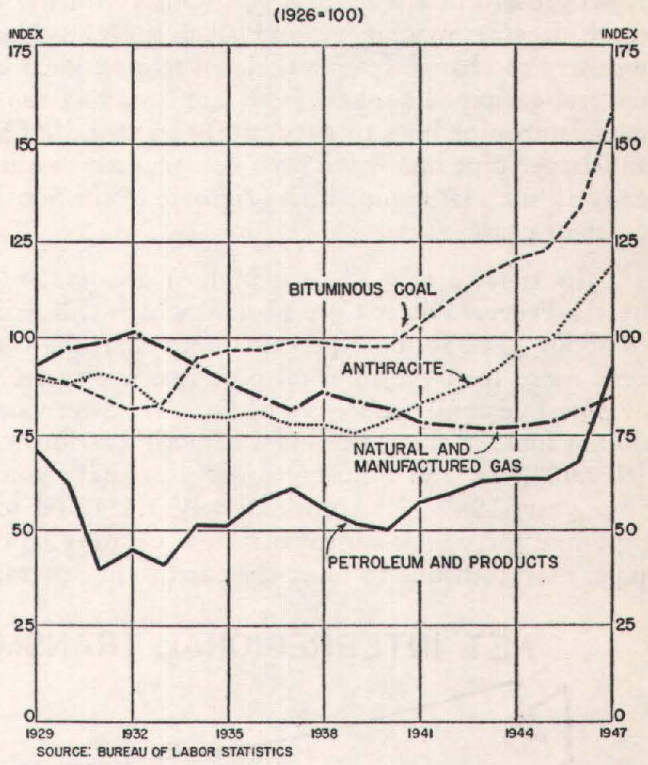
In 1948, a new all-time high of about 8,500 miles of new natural gas pipe lines was authorized by the Federal Power Commission, which will bring the total mileage of such lines in the United States to about 251,330, or 7 percent more than the total railroad mileage of the Nation and about 67 percent more than the total oil pipe-line mileage. Currently, applications for an additional 14,600 miles of pipe-line construction await Federal Power Commission approval. These natural gas pipe-line figures do not include the many miles of local distribution systems. Expenditures on pipe lines in 1948 totaled $650,000,000, and industry sources predict about $1,950,000,000 additional expenditures during the four years 1949-52. Approximately 3,675,000 tons of steel will be required for the 14,600 miles of pipe line for which approval is now pending, and supplies of steel, particularly in 24-inch to 30-inch pipe, may continue to limit the expansion programs of natural gas companies.



Over a long period the total consumption of energy from all sources has tended to rise. However, in the two decades following World War I, despite the increase in power requirements resulting from greater mechanization and industrialization, progress in more efficient utilization of fuels brought about some reduction in total fuel consumption. But, after 1940, industrial expansion far outweighed

technological advances in fuel utilization, so that total energy consumption rose rapidly. During the period 1919-40, while consumption of coal was slowly declining, the consumption of natural gas and petroleum products followed a generally upward trend, a trend which was accelerated during the war and postwar periods. The consumption of anthracite coal, which is utilized largely for residential heating, has fallen off gradually but steadily as the use of fuel oil and gas has increased. The decline in bituminous coal consumption reflects the growing efficiency of its industrial utilization, as well as the inroads of water power as a source of electrical energy and of oil and natural gas as fuels.

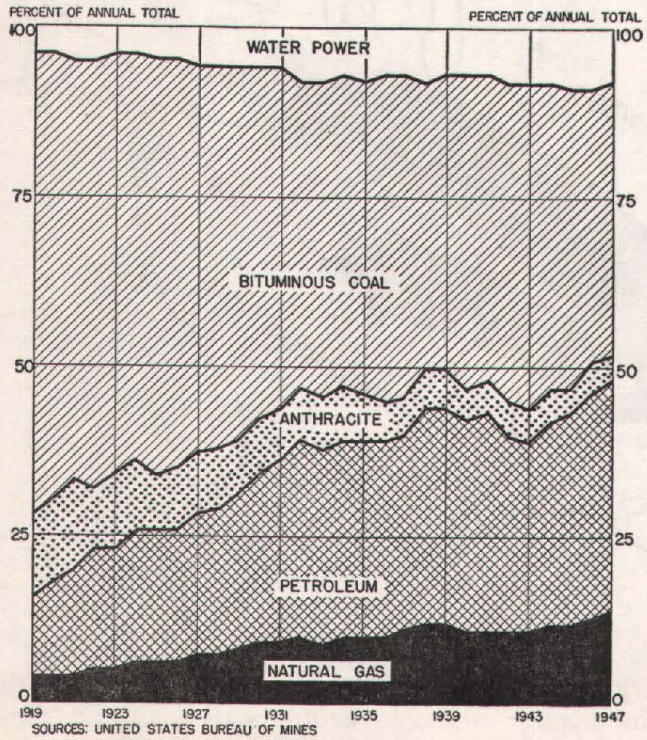
WHOLESALE PRICES OF MINERAL FUELS, 1929-47



SOURCE: BUREAU OF LABOR STATISTICS

The favorable postwar price position of natural gas as compared to coal and oil has stimulated the consumption of the former, particularly by industrial users. The electric utility industry may be referred to for an example of the impact upon costs of changes in the relative prices of different fuels. For a group of such utilities using coal, fuel costs per thousand kilowatt-hours rose 71 percent from 1939 to 1947, while unit fuel costs decreased 9 percent for a group of utilities using natural gas. Since 1932, bituminous coal prices have moved irregularly upward under the impact of rising labor costs. Anthracite prices were somewhat depressed by the loss of a part of the residential heating market to other fuels, but the war stimulated a price rise for that fuel. Petroleum prices increased but little during the 1930's due to the discovery and rapid development of large new fields, which added to supplies and exerted a depressing influence upon prices. While price control had the effect of moderating advances in petroleum prices during the war, the advances in the postwar period—brought about by the large demand in relation to supply—resulted in a price level in 1948 about double that in 1929. Gas, on the other hand, has been increasing steadily in availability, due to the opening of new fields and the extension of pipe lines, with the result that gas prices declined moderately from 1932 to the end of the war and have increased only slightly thereafter.

DISTRIBUTION OF TOTAL ENERGY CONSUMPTION IN THE UNITED STATES, 1919-1947



SOURCES: UNITED STATES BUREAU OF MINES
UNITED STATES DEPARTMENT OF COMMERCE

As a result of such factors, natural gas has exhibited the most striking increases in consumption among the various fuels, its share of the total energy consumed in the Nation having risen from 4.3 percent in 1919 to 13.7 percent in 1947. Furthermore, natural gas sales are expected by 1952 to exceed 1947 levels by more than half, according to a forecast by the National Security Resources Board. This relative and absolute increase in the use of natural gas has been largely at the expense of anthracite and bituminous coal, although much of the increased natural gas consumption has been due to its expansion into new areas and its introduction to new uses. Petroleum products and water power have risen in importance as energy sources at rates only a little less rapid than that noted for natural gas. In addi-

tion to natural gas, manufactured gas (made from coal, coke, oil, or tar) and mixed natural and manufactured gas have been used in increasing quantities, particularly in the Northeast; but the lower heat content and frequently higher costs of such gases have limited their use generally to areas where sufficient supplies of natural gas are not available, and the rate of increase in consumption of such gases has been less than that for natural gas.

The rapid growth in natural gas consumption since before the war has been the result both of greater demand and larger available supplies. The increase in demand has reflected generally higher incomes and the expansion of industrial facilities using gas as a fuel or raw material. The greater availability and cheapness of gas have been the results principally of the extension of pipe lines and the enlargement of transmission facilities. In addition, much recent industrial expansion has occurred in the Southwest, where natural gas is readily available. Of the total United States consumption of natural gas in 1947, about 58 percent was for industrial purposes, 30 percent for residential purposes, 9 percent for commercial purposes, and 3 percent for governmental and other uses. In the Southwest, despite the unusually high per capita consumption of gas by nonindustrial consumers, industrial users accounted for 74 percent of the total southwestern consumption in 1947, a higher proportion than for the Nation. In Louisiana, industrial use accounted for 84 percent of all consumption, in Arizona 77 percent, Texas 74 percent, New Mexico 65 percent, and Oklahoma 60 percent.

Geographically, 32 percent of the Nation's natural gas consumption in 1947 took place in the five southwestern states, while no other region of comparable size consumed more than 22 percent of the national total. The inclusion of manufactured and mixed gas puts the populous and highly industrialized Northeast only moderately ahead of the Southwest.

TABLE II

GAS SALES OF UTILITIES BY CLASS OF SERVICE, 1947

(In millions of cubic feet)

	Residential	Commercial	Industrial	Other	Total
Natural gas					
Arizona	3,197	2,229	18,805	314	24,545
Louisiana	17,749	6,472	166,918	6,355	197,494
New Mexico	4,700	3,587	16,195	274	24,756
Oklahoma	33,164	16,040	79,247	2,357	130,808
Texas	66,785	30,134	311,433	13,079	421,431
Total, 5 states	125,595	58,462	592,598	22,379	799,034
United States	740,572	224,295	1,467,504	82,880	2,515,251
Manufactured gas*					
Arizona	16	9	0	0	25
United States	291,274	68,566	69,723	4,538	434,101
Mixed natural and manufactured gas*					
United States	113,969	24,778	31,891	1,431	172,069
Liquefied petroleum gas*					
Arizona	76	47	†	†	123
New Mexico	10	5	0	0	15
Texas	49	33	†	†	82
Total, 3 states	135	85	†	†	220
United States	4,559	2,235	377	109	7,280
Total gas					
United States	1,150,374	319,874	1,569,495	88,958	3,128,701

*In the above five southwestern states, mixed gas was not reported, manufactured gas was reported in one state, and liquefied petroleum gas in three states.
†Less than 0.5 million.
SOURCE: American Gas Association.

TABLE III

NATURAL GAS USED BY LARGE INDUSTRIAL CONSUMERS IN THE UNITED STATE BY TYPE OF USE AND INDUSTRY, 1945

(In billions of cubic feet)

Industry	Gas engine fuel	Boiler fuel	Space heating	Heat treatment or processing	Chemical raw material	Other	Total
Nongovernment manufacturing							
Food	1.6	53.3	0.6	7.8	†	0.3	63.6
Textile	0	2.7	0.1	0.2	0	†	3.0
Paper	1.4	46.6	0.1	5.5	0	0.1	53.7
Chemical, including bone black, carbon and lamp black	12.0	97.3	0.8	43.2	204.4	1.9	359.6
Petroleum and coal	17.3	118.2	0.2	95.3	1.2	20.8	253.0
Rubber	†	3.5	†	0.5	†	†	4.0
Cement, clay, glass and stone	0.9	8.2	1.0	109.8	5.2	0.1	125.2
Iron and steel	0.2	11.0	2.8	90.8	0.1	1.3	106.2
Non-ferrous metal	0.2	7.7	0.5	37.3	0	0.2	45.9
Electrical machinery	†	0.2	0.1	3.4	0.1	†	3.8
Machinery	0.2	1.4	0.5	8.7	0	0.1	10.9
Automobile	†	1.1	0.2	5.3	0	†	6.6
Other transportation equipment	0.4	1.8	1.9	3.3	†	0.1	7.5
Miscellaneous	0.3	2.0	0.1	1.2	0	†	3.6
Total	34.5	355.0	8.9	412.3	211.0	24.9	1,046.6
Government manufacturing	2.8	7.8	0.5	7.5	0	0.3	18.9
Total manufacturing	37.3	362.8	9.4	419.8	211.0	25.2	1,065.5
Mining	1.6	24.0	0.5	5.1	†	†	31.2
Total, all industries	38.9	386.8	9.9	424.9	211.0	25.2	1,096.7

†Less than 0.05 million.
SOURCE: Federal Power Commission.

Almost 10,000,000 residential customers were being served by natural gas utilities at the end of 1947, or more than 1,000,000 above the level of the previous year and 2,700,000 above 1939. The amount of gas consumed by residential customers nearly doubled during the same period, the rapid increase being due mainly to the installation of more gas-using equipment and appliances, such as furnaces, space heaters, water heaters, and gas refrigerators. The Gas Appliance Manufacturers' Association estimates that domestic gas appliances in use for central heating numbered 2,300,000 at the end of 1947, or almost double the figure for the end of 1940. Although there has been more general use of gas, consumption of manufactured gas has not kept pace with that of natural gas. The number of users of manufactured gas declined by more than 500,000 during 1947 but remained about 1,000,000 above the 1939 level. At present, the number of residential users of each of these two types of gas is about the same, whereas at the end of 1939 approximately 2,000,000 more customers were using manufactured gas than were using the natural product. However, the average residential consumer of natural gas uses nearly twice as much gas as the consumer of other types of gas, mainly because of the lower price of the natural product. With the expansion of transmission facilities for natural gas and with rising costs for coal, required in the making of manufactured gas, some gas utilities have shifted from manufactured to natural gas or a mixture of the two.

Industrial uses of natural gas are many and varied. In 1945, among large manufacturing consumers of natural gas, space heating and boiler fuel accounted for 34.9 percent of the total consumption of natural gas by these concerns, gas engine fuel 3.5 percent, heat treatment or processing 39.4 percent, raw material uses 19.8 percent, and other uses 2.4 percent. The chemical and carbon black industries account for most of the use of natural gas as a raw material, while the majority of its use as gas engine fuel is by the chemical and petroleum refining industries. Use of natural gas in heat treating or processing is important in many different industries, for example, the manufacturing of cement, in which powdered limestone or oyster shells and clay or shale are burnt; brick, tile, and pottery making, in which kiln drying is an essential step; the glass industry, in which sand, soda ash, lime, and other ingredients are melted and fused; the iron and steel and other metal and metal-working industries, in which gas may supply the heat for melting or softening metals during various stages of production; petroleum refining, in which cheap and abundant gas is often used to supply the heat for distillation and cracking processes; and the chemical, bone black, and lamp and carbon black industries, in which gas may serve as a source of heat as well as a raw material.

TABLE IV

INDUSTRIAL CONSUMPTION OF NATURAL GAS IN THE UNITED STATES BY TYPE OF INDUSTRY, 1935-46

(In billions of cubic feet)

Year	Field use	Carbon black plants	Petroleum refineries	Portland cement plants	Electric public utility power plants	Other	Total
1935	580	242	80	27	125	442	1,496
1936	618	283	93	37	156	517	1,706
1937	651	341	113	40	171	597	1,914
1938	659	325	110	37	170	511	1,812
1939	681	347	98	40	191	607	1,964
1940	712	369	128	42	183	643	2,076
1941	686	365	148	54	205	759	2,218
1942	721	336	202	65	239	801	2,363
1943	781	316	244	52	306	972	2,669
1944	855	356	315	36	360	992	2,914
1945	917	432	338	38	326	1,011	3,063
1946	898	478	332	58	307	1,038	3,110

Note: Includes some mixed gas and gas from both utility and non-utility sources.

SOURCES: United States Bureau of Mines.
Federal Power Commission.

Among manufacturing industries, carbon black plants are the largest users of natural gas, and consumption by this industry has nearly doubled since 1935. About two-thirds of the United States carbon black production in west Texas, while nine-tenths is in the Southwest. This industry requires large volumes of very cheap gas, ordinarily gas not tapped by a transmission pipe line that might make accessible a more lucrative market. The meeting of this requirement tends to coincide with another, namely, distance from large populations, which would find objectionable the smoke produced during the flaring of the gas to make the soot or carbon black. The sour gas of northwest Texas, due to its undesirable sulphur content, has only a limited use other than as a raw material for carbon black production. Carbon black is used chiefly by the rubber industry to increase the resiliency, wear-resistance, and surface-gripping qualities of automobile, truck, and airplane tires. The upward trend in rubber consumption and the wartime introduction of synthetic rubbers requiring a greater proportion of carbon black have contributed to the expansion of carbon black production. Carbon black has a few other but much less important uses, chiefly as a black pigment used in the making of ink and paint.

The second largest industrial consumer of natural gas is the petroleum refining industry. Consumption of natural gas by this industry is now more than four times the 1935 figure, partly due to the greater availability of the gas in the refinery areas and the rising market price of petroleum as compared to gas, but also due to the rapid increase in the extraction of natural gasoline from natural gas. The removal of certain volatile liquids, mainly natural gasoline, does not appreciably affect the suitability of the gas for fuel purposes but does provide a liquid which, when blended with refinery gasoline, increases the volatility and octane rating of the final gasoline product. Hence, large volumes of gas are first made to yield natural gasoline before being used as fuel or being pumped or recycled back into the gas or oil field formations to maintain or rebuild reservoir pressures. In oil fields this recycling process assures greater ultimate recovery of the oil. Natural gasoline plants are located near the source of the gas from which their products are extracted. Such proximity is virtually a necessity, since the wet gas used is less easily piped than dry gas due to the tendency of the gaseous liquids to condense under pressure or at low temperatures. When the gas is recycled back to the underground reservoirs, location of plants near the source of the gas is doubly desirable. As a result of these locational factors, 70 percent of the Nation's natural gasoline output was in the Southwest in 1946, with Texas accounting for 47 percent, Louisiana 12 percent, Oklahoma 9 percent, and New Mexico 2 percent. For 15 years the Southwest's output of natural gasoline has been increasing steadily and at a faster rate than the total output of the Nation.

The chemical industry in the Southwest was stimulated greatly by the war, particularly in the case of those sectors of the industry using the abundant raw materials of the area. A considerable variety of chemical products is now produced in southwestern plants from natural gas and natural gas liquids in combination with water, sea water, salt, or coal. The dry gas remaining after the extraction of chemical raw materials is used as fuel. Thus, chemical production does not necessarily decrease the total availability of natural gas for fuel purposes. On the basis of employment figures for the chemical industry, the Southwest still has considerably less than its per capita share. At the end of 1948, Texas had only 2.9 percent of the Nation's chemical plant workers, as compared with about 4.9 percent of the Nation's population. However, the phase of the chemical industry which is dependent upon natural gas is more highly concentrated in the Southwest than is true of other types of chemical production.

TABLE V

REPRESENTATIVE CHEMICALS MADE FROM NATURAL GAS IN TEXAS

Chemicals	Raw materials	Used in
Ethylene glycol	Natural gas, water	Permanent type antifreeze
Propylene glycol	Natural gas, water	Lipstick, lotions, extracts, foods, tobacco moistener
Dipropylene glycol	Natural gas, water	Hydraulic brake fluid
Triethylene glycol	Natural gas, water	Air germicide
Ethylene dibromide	Natural gas, sea water	Ethyl gasoline
Methyl chloride	Natural gas, salt	Household refrigerators
Methylene chloride	Natural gas, salt	Paint remover
Chloroform	Natural gas, salt	Anesthetic
Carbon tetrachloride	Natural gas, salt	Dry-cleaning fluid
Perchloroethylene	Natural gas, salt	Metal cleaning
Hydrochloric acid	Natural gas, salt	Treating oil wells
Vinyl chloride	Natural gas, salt	Plastics, seat covers
Ethylene dichloride	Natural gas, salt	Insecticide
Toluene	Natural gas, coal	T.N.T. explosive
Styrene	Natural gas, coal	Synthetic rubber, plastics

SOURCE: The Dow Chemical Company.

Helium is obtained almost exclusively from the natural gas wells of Texas. This second lightest of all gases does not burn and so is used in lighter-than-air craft as well as in various industrial applications. The Government controls its output and use. Hydrogen, the lightest of all gases though an inflammable one, is also obtained from natural gas and is used in lighter-than-air craft as well as in welding and other industrial uses.

Cement production has expanded at a somewhat faster rate in the Southwest than in the Nation, due to the relatively higher rate of construction. The comparatively low value per pound of cement causes shipping charges to be an appreciable proportion of delivered costs, so that the cement industry has tended to locate near its markets and to be drawn toward fuel sources, particularly when those sources are within economical proximity to markets for cement. Cement plants in Texas are located at Dallas, El Paso, Fort Worth, Houston, San Antonio, and Waco, with a new plant under construction at Corpus Christi. This geographical distribution of production assures supplies for the large centers of construction activity in the area. The abundance of natural gas for fuel and of limestone, oyster shells, shale, and clays for raw materials, as well as the expanding markets of the Southwest, make the area a suitable location for cement plants. While natural gas and petroleum are the obvious fuels for southwestern cement plants, in 1946 over half of all cement plants in the Nation depended

on coal and one-fifth of the plants used coal along with natural gas or oil. Only 7 percent used natural gas alone, while 12 percent used natural gas along with oil or coal.

The glass industry has been concentrated in Pennsylvania, Ohio, and West Virginia, with these three states accounting for about half of the national output. Much of the remainder of the national glass production capacity is also in the Northeast, and nearness to markets and the availability of natural gas have been factors tending to hold the industry in that general area. However, in recent years, glass plants have been attracted to Oklahoma and Texas to take advantage of the increasing importance of southwestern markets as well as the greater cheapness and abundance of natural gas in the Southwest. Glass sand, also available in the Southwest, is less important as a locational factor than are markets and natural gas.

The conservation of natural gas received virtually no attention during the early years of the industry. An apparent excess of reserves, plus production far in excess of consumption, resulted in a low market value for gas and, hence, little effort to preserve it for future use. Because much of the gas was produced as a by-product of oil field activity, with casinghead gas flowing out along with the crude oil, the production and frequently the excessive waste of natural gas tended to be somewhat unplanned results of oil production. Thus, it was considered less feasible to cut gas output to the level of consumption than simply to release the surplus gas into the atmosphere or to flare the gas. The great distances from some gas-producing fields to large potential markets made it more difficult to put the gas to practical use. The practice of wasting gas was encouraged further by the misconception that the presence of gas necessarily interfered with the recovery of oil. Waste of gas as well as oil also occurred when producers attempted to get as much of the oil or gas as they could before an adjoining producer might drain the common underlying pool. Another cause of the loss of gas was the blowing of wells to remove water, sand, and debris and to test their open-flow capacities. Additional sources of waste are leaks in pipe lines, inefficient burning of gas, and the use of high-quality sweet gas in the making of carbon black when sour gas could be used.

Recent developments have been more encouraging of conservation. The building of an ever-wider network of pipe lines has provided a profitable market and higher price at the well for gas that once would have been wasted as a valueless substance. This proved an economic incentive to the conservation of gas still within the ground. A very large investment in pipe lines and facilities for the transmission and distribution of natural gas, as well as in appliances, equipment, and plants, has been premised upon the continued availability of natural gas; and this heavy investment has greatly strengthened the economic incentive to conservation. Furthermore, the increasing interest in obtaining a maximum recovery of the petroleum has led to greater knowledge of the significance of natural gas in the maintenance of oil field pressures, with the result that the gas is less often released or flared and is more often retained in or returned to the underground formations. In recent years the process of extracting natural gasoline and other valuable liquids from wet natural gas has added to the value of the original gas and thus created more incentive for its conservation. An additional force making for conservation has been the unitization movement, by which the output of an oil or gas field may be regulated with a view to maximum ultimate recovery. Such unitization prevents producers from wasting oil and gas underlying the wells of other producers in the same field.

As the Southwest develops industrially, providing a larger market within the region for its natural gas, conservation measures will become economically more necessary and attractive. Consumption of natural gas within the region is already at high levels and is increasing steadily. Research and experimentation may be expected to develop new uses for this resource, particularly as a raw material. The chemistry of the hydrocarbons suggests considerable possibilities for the development of a variety of products made from natural gas.

The per capita consumption of natural gas in the Southwest in 1947 was 62,000 cubic feet, or about three times the national rate for all types of gas combined. Of that figure, industrial consumption of natural gas in the Southwest accounted for 46,000 cubic feet per capita, or more than four times the national average for all types of gas. The southwestern market is by far the most important to the natural gas industry of the region, for only one-fifth of the southwestern production was piped outside the area. On the basis of projected pipe-line construction, the transmission of gas to other

areas appears likely to increase substantially. Nevertheless, the utilization of this resource within the Southwest also should continue to increase, due to the rapid growth of population, income, and industry.

The significance of natural gas to the further industrial development of the Southwest lies chiefly in its role as an added inducement to industrial enterprises which might be drawn to the region by such other factors as the abundance of raw materials and labor and the rapid growth of the southwestern market. At present, there are relatively few industries to which an abundance of cheap natural gas is a really decisive factor. The Southwest already has a major share of these few industries—chiefly carbon black and certain types of chemical production—and the future expansion of such industries seems most likely to occur in this area. In most other industries the southwestern market, labor supply, and raw materials may bulk larger in the production and distribution cost picture. However, the presence of an ideal fuel in large amounts at a low price is an important consideration and one that may frequently prove decisive when other factors are inconclusive. Though natural gas alone rarely determines the location of an industrial plant, the availability of gas along with other advantages may result in a very economical combination.

Some advantages of the Southwest as a location for industry may be summarized briefly. This region produces two-thirds of the Nation's petroleum, virtually all of its sulphur, and large amounts of coal, limestone, and salt, as well as iron, gypsum, sand, clay, gravel, and timber. Numerous agricultural commodities are produced, such as cotton, cottonseed, wool, mohair, and various food products. The land, sea, and air transportation system of the area is well-developed, and the population is growing rapidly. The income and market of the Southwest are expanding, and the industrial growth of the region is at a faster rate than for the Nation. In combination with these advantages, the presence of abundant and cheap natural gas in the Southwest is particularly significant to the industrial development of the area.

Numerous and varied industries, in addition to those already mentioned, are utilizing this combination of advantages. Other industries may be expected to have a similar experience. For example, with suitable clays widely available, the brick, tile, pottery, and other ceramic industries may find the plentiful supply of cheap natural gas for use in their kilns an inducement to expansion in the Southwest. Heating is necessary in paper making, textile dyeing, the porcelain enameling of numerous products, and the fabricating of plastics, rubber, metals, and other materials. Natural gas has made a contribution in each of these cases and might well be a factor in the further growth of such activities in the Southwest. Numerous agricultural products of the region may be dried or dehydrated using natural gas as a fuel, for example, dried alfalfa, sweet potatoes and citrus pulp dehydrated for feed, powdered eggs and milk, and condensed milk. Such activities contribute to the agricultural as well as the industrial and business sectors of the economy. Research and experimentation may be expected to create ever-widening possibilities for the use of natural gas, as well as to expand its utilization in present fields.

In making a summary appraisal of the future role of natural gas in the Southwest, it may be stated that as the population and income of the area continue to increase, the super-abundance of cheap natural gas will facilitate the introduction or expansion of many different industries whose growth in the region is economically feasible. In addition, natural gas can reduce the delay in the introduction of new industrial enterprises. This role for natural gas is by no means minor, for it means a somewhat faster rate of general industrial growth. The wide diversity of industries which find natural gas an added inducement to development within the Southwest is of great importance to the sound, well-rounded growth of the region's industrial economy. As the production and utilization of natural gas increase in the Southwest and as research into new uses broadens the market for this resource, the value of natural gas and its contribution to the economy of the region will increase. This, in turn, will add to incomes and enlarge the market of the Southwest and thus stimulate the growth of other industries in the area.

Review of Business, Industrial, Agricultural, and Financial Conditions

DISTRICT SUMMARY

The heavy rains and snows during January broke the extended drought in most sections of the Eleventh Federal Reserve District, greatly improving the outlook for livestock ranges and for 1949 crop production. The snow cover during the period of severe weather protected most small grains and winter legumes, but the unusually low temperatures in south Texas caused extensive losses of commercial vegetables and citrus fruits. Livestock showed a substantial shrinkage in weight despite heavy feeding of roughage and concentrates but are expected to improve rapidly in the near future as better ranges become available. Farm prices of livestock, poultry, most livestock and poultry products, and grains have declined substantially since the first of the year, while prices of fruits, vegetables, and wool have made substantial gains.

Department store sales in the Eleventh District declined by more than the usual seasonal amount from December to January and were 7 percent smaller than in January 1948, reflecting in part one less trading day this January than last. Sales of reporting furniture stores, which had shown a large seasonal increase in December, declined sharply in January and were about one-fifth smaller than in the corresponding month of 1948. Inventories of department stores at the end of January were not significantly different from those at the end of December and January 1948. Reports indicate a generally favorable consumer response to the substantial mark-downs in prices of numerous items of merchandise.

The daily average production of crude petroleum in the United States declined during January, reflecting largely the cut-back in this District. The daily output in the District was about 6 percent smaller in January than in December, and further declines are foreshadowed for February and March due to the substantial reductions in production allowables in Texas. Refinery operations are being reduced both in the District and in the Nation. The value of construction contracts awarded in the Eleventh District during January was only about one-half the large December volume and was considerably under the total for January 1948. The decline was common among all classes of construction.

The deposits of weekly reporting member banks in leading cities of the District declined substantially during the four weeks between January 12 and February 9, but were still moderately above those on the corresponding date of 1948. During the four weeks there were noticeable declines in both loans and investments. To meet the decline in deposits, these banks also withdrew some of their excess balances with the Federal Reserve Bank and made substantial withdrawals from their balances with other commercial banks.

BUSINESS

The dollar volume of sales at department stores in the Eleventh Federal Reserve District declined more than seasonally in January, being 55 percent smaller than in the previous month and 7 percent below that of January 1948. Reflecting this decline, the adjusted index of sales, which makes allowance for seasonal factors and the varying number of trading days, moved downward to 377 percent of the 1935-39 average from 397 percent in the previous month and 390 percent in January of last year. The decline in January sales from those a year ago was more pronounced in the District than in the Nation. The more favorable comparison for the Nation reflects in part the generally favorable weather conditions in the eastern part of the country in contrast with the very severe weather prevailing a year earlier. The Eleventh District experienced unfavorable January shopping conditions both in 1948 and 1949, due to adverse weather during the latter half of each month.

A factor sustaining business in this District was the widespread promotion and clearance sales that met with generally favorable response from consumers during January and early February. This response, together with the recent rise in the rate of savings, suggests the existence of a sizable reservoir of purchasing power and a backlog of demand that becomes evident when prices are considered reasonable and the quality of merchandise is satisfactory. However, the more adequate supplies and the extensive volume of consumer purchasing since the end of the war have resulted in a less pressing demand for many goods and a tendency to await the opportunity to purchase better merchandise at lower prices. This is reflected in increased "shopping" by and selectivity of the consumer in making purchases, as well as the price reductions being offered by retailers who are competing intensively to maintain their share of the trade volume.

WHOLESALE AND RETAIL TRADE STATISTICS

		Percentage change in			
	Number	Net sales		Stocks‡	
	of	January 1949 from		January 1949 from	
Retail trade:	reporting	January	December	January	December
Department stores:	firms	1948	1948	1948	1948
Total 11th District	48	— 7	—55	— †	1
Corpus Christi	4	—13	—59	— 4	— †
Dallas	7	—10	—54	10	5
Fort Worth	4	— 7	—58	5	†
Houston	7	2	—55	—10	— 2
San Antonio	5	—14	—48	—10	— 5
Shreveport, La.	3	6	—59	..	..
Other cities	18	— 7	—58	— 2	— †
Furniture stores:					
Total 11th District	43	—17	—44	5	— 2
Dallas	4	—18	—30	— 9	— 4
Houston	5	— 9	—44	..	..
Port Arthur	4	— 9	—27	8	1
San Antonio	4	—26	—54	..	..
Wholesale trade:*					
Automotive supplies	3	— 7	4	..	..
Drugs and sundries	3	— 1	7	..	..
Dry goods	3	†	56	24	16
Full-line wholesalers not sponsoring groups	23	—14	†	— 3	13
Hardware	7	—21	4	9	14
Tobacco products	10	— 3	—13	2	7
Wiring supplies, construction materials distributors	3	—15	— 5	..	..

*Preliminary data. Compiled by United States Bureau of Census. ‡Stocks at end of month
†Indicates change of less than one-half of one percent.

INDEXES OF DEPARTMENT STORE SALES AND STOCKS

Daily average sales—(1935-39=100)

	Unadjusted*			Adjusted			
	Jan. 1949	Dec. 1948	Nov. 1948	Jan. 1948	Jan. 1949	Dec. 1948	Nov. 1948	Jan. 1948
11th District.	306	648	475	316	377	397	390	390
Dallas.....	277	581	432	295	338	368	357	359
Houston.....	363	769	561	342r	466	483	464	439r

Stocks—(1935-39=100)

	Unadjusted*			Adjusted			
	Jan. 1949	Dec. 1948	Nov. 1948	Jan. 1948	Jan. 1949	Dec. 1948	Nov. 1948	Jan. 1948
11th District.	345	352	431	342r	384	419	402	379r

*Unadjusted for seasonal variation. r-Revised.

An analysis of the departmental sales of stores accounting for the major portion of the department store business in the District shows that sales increased substantially as compared with a year ago in the household textiles, men's and boys' wear, and in the basement departments, where price reductions appeared the most pronounced. On the other hand, sales in the housefurnishings departments, particularly of major household appli-

ances, which had slowed down considerably in the fourth quarter of 1948, were substantially below those in January 1948. Moderate declines from a year ago also occurred in sales of piece goods and women's ready-to-wear and ready-to-wear accessories.

The dollar value of inventories at reporting department stores in this District has shown a year-to-year increase each month for more than three years. This marked upward trend has reflected the substantial increases in prices and the efforts of retailers to obtain a larger volume and a wider selection of merchandise to meet the expanding consumer demand. During each month of the final quarter of 1948, however, the value of stocks showed progressively smaller year-to-year gains, reflecting the cautious buying policies of retailers, lower prices on numerous items of merchandise, and the aggressive efforts of retailers to move merchandise through clearance sales. At the end of January, the value of department store inventories was only about 1 percent larger than a month earlier or a year ago. The value of outstanding orders, which had declined sharply in the fourth quarter of 1948, showed a moderate seasonal expansion in January but at the end of the month was 39 percent smaller than on the corresponding date in 1948. This tendency to restrict the volume of forward buying reflects the caution of retailers in the face of uncertain trends in prices and consumer demand, as well as the ready availability of most goods for immediate or near-by delivery.

January sales at reporting furniture stores in the Eleventh Federal Reserve District declined seasonally from those in December and continued the year-to-year decrease that began in October of last year. Both cash sales and credit sales showed the usual downward movements from December to January and were substantially lower than in January 1948. The much larger decrease in cash sales than in credit sales, however, resulted in an increase in the ratio of credit sales to total sales to 85 percent in January this year, as compared with 81 percent in January 1948. Despite the increase in the ratio of credit sales to total sales, the volume has shown little net change since September of last year, and since that time the margin of increase over the corresponding month of the preceding year has become narrower each month. At the end of January, accounts receivable were about 5 percent lower than a month earlier but 26 percent larger than a year ago.

The increased availability of better-quality furniture in the medium-price range has encouraged retailers to move less desirable merchandise at reduced prices and to restock with the newer styles in popular demand. This trend has enabled many furniture stores to improve their competitive position in the trade and to adjust total inventories to a level more nearly in line with sales. Inventories of reporting stores at the end of January were 2 percent below those at the close of December and 5 percent above those a year ago.

AGRICULTURE

Snow, sleet, and moderate to heavy rains over the Eleventh District during January and early February effectively ended the prolonged drought, although there is need for additional subsoil moisture in some sections where the drought was most severe. The unfavorable weather during this period retarded field work and caused extensive damage to growing crops. Freeze damage to winter oats appears to have been most serious in the Blackland counties of north Texas, where the cold weather was very severe prior to the snow. Loss of stands is reported to have been quite heavy, and some reseeding has been under way. The winter wheat and legume crops apparently escaped serious damage because of the snow cover and are already showing improvement as a result of the additional moisture. The blanket of snow also protected the Texas flax crop, although some damage to early plantings occurred in a limited area.

Crop losses resulting from the cold weather of late January were most serious in the commercial vegetable areas. While the full extent of damage to broccoli, lettuce, and some other crops could not be determined as late as mid-February, such crops as beets, cabbage, carrots, onions, potatoes, and spinach at that time showed promise of fairly good recovery. Replanting of beans, sweet corn, cucumbers, tomatoes, squash, and other spring crops destroyed by the freeze has been active except where delayed by wet fields. While the south Texas onion crop escaped serious damage and is making good progress toward almost complete recovery, it has been necessary to replant some of the north Texas onions which were frozen to the ground. Vegetable harvest was greatly curtailed by cold weather and wet fields during early February, but some cabbage, carrots, and spinach moved to market.

The Texas citrus crop was damaged severely by the cold weather of January 30-31, and fruit began falling rapidly as warmer weather developed. Estimates supplied by the United States Department of Agriculture indicate that the quantity of grapefruit utilized from the current crop will total only 14,500,000 boxes, which would be 76 percent of the estimated crop. On the basis of this latest estimate and the quantity utilized prior to February 1, about 7,300,000 boxes of marketable grapefruit were available for shipment and processing after the freeze, compared with about 13,800,000 boxes utilized after January 31, 1948. The Texas orange crop estimate was lowered to 4,000,000 boxes—a reduction of 15 percent from the earlier estimate. The loss from freeze damage is largely in the Valencia crop, as harvest of this variety was just getting under way and other varieties were mostly harvested. The lemon crop that remained for harvest was a total loss. Most citrus trees have been shedding their leaves, and many are expected to be defoliated completely. Bud wood was damaged badly, and some of the younger trees show both bark and wood damage. Shipments of citrus from the beginning of the season in October to mid-February were 28 percent below those to the same date in 1948.

STOCKS OF WHEAT IN ALL POSITIONS, JANUARY 1, 1949

(In thousands of bushels)

	On farms		Off farms		Total stocks	
	1949	1948	1949	1948	1949	1948
Arizona	129	41	268	182	397	223
Louisiana	.....	.....	1,220	1,619	1,220	1,619
New Mexico	697	2,449	225	650	922	3,099
Oklahoma	10,886	16,757	38,045	26,852	48,931	43,609
Texas	8,444	23,611	38,580	33,878	47,024	57,489
Total	20,156	42,858	78,338	63,181	98,494	106,039
United States	381,667	428,666	475,379	372,946	857,046	801,612

SOURCE: United States Department of Agriculture.

Total stocks of wheat in the states lying wholly or partly within the Eleventh Federal Reserve District were 7 percent smaller on January 1 than those of the same date in 1948, as shown in the accompanying table. Declines occurred in each of the five states except Arizona and Oklahoma, where substantial increases were reported. Stocks of wheat on farms were down 53 percent and represented only 20 percent of all stocks, as compared with 40 percent last year. The five-state total of wheat stocks in off-farm positions—mills, elevators, warehouses, etc.—was up 24 percent as compared with a year earlier. Total stocks of wheat in the United States on January 1 were up 7 percent—the net result of an increase of 27 percent in off-farm stocks and an 11 percent decline in stocks stored on farms.

STOCKS OF SELECTED FEED GRAINS IN OFF-FARM POSITIONS, JANUARY 1, 1949

(In thousands of bushels)

	Corn		Oats		Grain sorghums	
	1949	1948	1949	1948	1949	1948
Arizona	15	16	28	31	661	527
Louisiana	1,449	29	4	17	0	0
New Mexico	60	38	75	25	330	420
Oklahoma	451	488	359	490	1,116	644
Texas	1,690	1,282	787	1,272	19,756	8,948
Total	3,665	1,853	1,253	1,835	21,863	10,539
United States	92,743	49,221	46,011	46,688	32,461	16,786

SOURCE: United States Department of Agriculture.

Combined stocks of feed grains held in off-farm positions in the five states on January 1 were considerably larger than a year earlier, as shown in the accompanying table. Stocks of corn were up about 98 percent, due principally to large increases in Louisiana and Texas. Stocks of grain sorghums were more than double those of last year, with the largest increases reported in Oklahoma and Texas. The five-state totals of stocks of oats and barley, on the other hand, were down 32 percent and 73 percent, respectively. Stocks of feed grains in off-farm positions in the United States on January 1 were 34 percent larger than a year earlier, while stocks of feed grains stored on farms had increased 53 percent.

Spring range feed prospects improved sharply as drought-breaking rains, sleet, or snow blanketed the entire District during much of January and early February. Increased grazing of wheat and oats is expected with the advent of warmer weather. Winter weeds, clovers, and rescue grass, which are already showing improvement, will make more rapid growth as temperatures moderate. Meanwhile, supplemental feeding of livestock continues on large scale. All range feed in Texas on February 1 was reported to be in about the same condition as a month earlier but still 11 percent below the average for this season of the yaer.

Livestock in the District have suffered from the most severe winter weather in many years. Despite heavy feeding of roughage and concentrates, cattle have shown heavy shrinkage in weight and generally are thin. Losses of new-born range calves due to storms were very heavy, although losses of older animals were light. On February 1, cattle in Texas were reported to be in slightly less satisfactory condition than a month earlier and substantially below the average for this season. The condition of sheep and lambs in the District showed a slight decline during January. Ewes and yearlings have shown heavy shrinkage in weight, but losses generally were lighter than expected in view of the extremely low temperatures and heavy snows. On February 1, the condition of sheep and lambs in Texas was estimated at 8 percent below average for this season of the year.

CATTLE AND SHEEP ON FEED, JANUARY 1, 1949

(Thousand head)

	Cattle on feed		Sheep on feed	
	1949	1948	1949	1948
Arizona	62	65	15	55
Louisiana	0	0	0	0
New Mexico	33	22	30	44
Oklahoma	70	50	30	25
Texas	144	115	120	100
Total	309	252	195	224
United States	4,548	3,821	4,145	4,851

SOURCE: United States Department of Agriculture.

The total number of cattle on feed in the five states of the District on January 1 was 23 percent above that of the same date last year, as shown in the above table. In the United States the total number of cattle on feed was the largest on record, with the principal increases occurring in the Corn Belt states and in California, Colorado, Texas, and Oklahoma.

The total number of sheep and lambs on feed in the five states on January 1 reflected a decline of 13 percent from last year, although increases are reported for Oklahoma and Texas. The decrease in this area was only slightly under the 15 percent decline reported for the United States.

LIVESTOCK RECEIPTS—(Number)

	Fort Worth market			San Antonio market		
Class	Jan. 1949	Jan. 1948	Dec. 1948	Jan. 1949	Jan. 1948	Dec. 1948
Cattle	39,018	34,437	48,368	24,699	29,342	24,517
Calves	20,737	27,303	29,242	14,111	17,949	15,659
Hogs	52,693	70,932	76,819	7,535	12,648	6,675
Sheep	35,064	45,439	59,711	16,853	21,065	36,196

TOP LIVESTOCK PRICES

(Dollars per hundredweight)

	Fort Worth market			San Antonio market		
Class	Jan. 1949	Jan. 1948	Dec. 1948	Jan. 1949	Jan. 1948	Dec. 1948
Slaughter steers	$26.00	$32.25	$35.00	$23.50	$29.00	$26.50
Stocker steers	25.50	27.50	25.00	.....	.....	.....
Slaughter cows	20.50	22.50	21.00	20.50	22.50	20.50
Slaughter heifers and yearlings	27.00	33.25	33.00	24.00	29.00	26.00
Slaughter calves	25.75	30.00	26.00	25.25	28.00	26.00
Stocker calves	24.50	26.50	26.00	25.00	25.25	25.00
Slaughter lambs	24.00	26.00	25.00	24.25	24.25	23.50
Hogs	22.00	28.25	24.00	21.00	27.50	23.50

The movement of livestock into the Fort Worth and San Antonio markets in January was 29 percent below that of December and 19 percent below January 1948, as the usual seasonal trends were accentuated by unfavorable weather conditions. Declines occurred chiefly in receipts of calves, hogs, and sheep. January receipts of cattle, while 13 percent under those in December 1948, were about the same as a year earlier.

Prices received by Texas farmers for all agricultural commodities at mid-January averaged the lowest since March 1948, according to the January 15 price report of the United States Department of Agriculture. The decline from the level of mid-December was due principally to lower prices for poultry and eggs, hogs, and dairy products, which more than offset substantial gains registered for sweet potatoes, citrus fruits, truck crops, and wool. Most other commodities showed only limited price changes.

Cash prices of most grains in the principal commodity market centers, which had shown a moderate downward trend during the last half of January, declined sharply in the early part of February but had recovered part of the decline by mid-February. Prices of hogs, after remaining generally stable during the latter half of January, declined sharply in the first half of February, while prices of cattle and lambs declined steadily from January 15 to mid-February. During the period between January 15 and February 15, cotton prices reflected an irregular trend, fluctuating within a range of less than two cents per pound, but showed little net change for the period.

FINANCE

Between January 12 and February 9, total loans, investments, and deposits of selected member banks in leading cities in the Eleventh Federal Reserve District followed a more or less seasonal pattern. Loans of these banks declined by $11,473,000, total investments were $36,872,000 less than at the beginning of the period, while total deposits declined by about $180,257,000.

All major categories of loans declined except "all other" loans, which showed an increase of about $5,096,000. A minor increase was also reported in loans to brokers and dealers in

securities, but these increases were insufficient to offset decreases of more than $13,000,000 in commercial, industrial, and agricultural loans and approximately $3,370,000 in other loans for security trading. Commercial, industrial, and agricultural loans —the type of borrowing which reflects the demand of business, industry, and agriculture for borrowed working capital purposes—declined during each week of the period as repayments of past loans exceeded new demands for credit. In addition to normal seasonal influences at work at this time of year, the loan demand may have been influenced in some degree by business uncertainty and a moderate slowing down in business activity.

During the four-week period ended February 9, these selected member banks in the District reduced their holdings of United States Government securities by $37,414,000 as holdings of Treasury bills declined by $30,868,000 and certificates of indebtedness by almost $13,000,000. The decline in holdings of these short-term securities was offset to a slight degree by an increase in purchases of United States Government bonds amounting to $6,250,000 during the period.

Reflecting the heavy tax demands upon individuals and corporations, demand deposits adjusted declined by $89,512,000. The principal decline in demand deposits occurred during the last week in January, but fairly substantial declines also were reported for the third week in January and the second week in February. In response to the demand for funds by individuals, partnerships, and corporations, which resulted in some pressure against the reserves of the member banks, interbank deposits were drawn down during the period by $109,314,000.

CONDITION STATISTICS OF WEEKLY REPORTING MEMBER BANKS IN LEADING CITIES—Eleventh Federal Reserve District

(In thousands of dollars)

Item	Feb. 9, 1949	Feb. 11, 1948	Jan. 12, 1949
Total loans and investments	$2,294,876	$2,238,805*	$2,343,221
Total loans—Net‡	1,111,477		1,122,901
Total loans—Gross	1,120,088	1,029,957*	1,131,561
Commercial, industrial, and agricultural loans	783,182	724,421	796,316
Loans to brokers and dealers in securities	5,552	5,764	5,098
Other loans for purchasing or carrying securities	56,570	60,247	59,940
Real-estate loans	88,738	78,686	89,217
Loans to banks	35	413	75
All other loans	186,011	160,426	180,915
Total investments	1,174,788	1,208,848	1,211,660
U. S. Treasury bills	26,183	4,779	57,051
U. S. Treasury certificates of indebtedness	274,224	166,265	287,220
U. S. Treasury notes	41,543	96,751	41,343
U. S. Government bonds (incl. gtd. obligations)	712,351	827,167	706,101
Other securities	120,487	113,886	119,945
Reserves with Federal Reserve Bank	546,237	475,479	563,744
Balances with domestic banks	233,633	252,240	340,475
Demand deposits—adjusted*	1,932,769	1,843,482	2,022,281
Time deposits except Government	417,865	385,470r	412,853
United States Government deposits	46,963	33,956r	33,406
Interbank demand deposits	534,839	568,739	644,153
Borrowings from Federal Reserve Bank	4,000	8,200	0

*Includes all demand deposits other than interbank and United States Government, less cash items reported as on hand or in process of collection.

‡After deductions for reserves and unallocated charge-offs. r-Revised.

*Prior to June 30, 1948, the individual classes of loans were reported net; however, the amount of reserves deducted subsequent to June 30, 1948, was so small as to have no significant effect upon the comparability of the data.

Gross demand deposits of all member banks in the District, however, increased during January by about $3,296,000, while time deposits of the District's member banks increased by $11,828,000. All of the increase in demand deposits occurred at the District's country banks, while the increase in time deposits was greatest at the Reserve city banks. Gross demand deposits of country banks increased by almost $4,500,000, while Reserve city banks reported a reduction in gross demand deposits of over $1,000,000. The increase in time deposits at the Reserve city banks of the District amounted to more than $8,500,000, in contrast with an increase of slightly more than $3,000,000 at the District's country banks. It will be recalled that gross demand deposits of the member banks of the District have shown a steadily rising trend for the past nine months, while time deposits have increased monthly during the past year except during May and September when slight declines were reported.

GROSS DEMAND AND TIME DEPOSITS OF MEMBER BANKS

Eleventh Federal Reserve District

(Averages of daily figures. In thousands of dollars)

Date	Combined total: Gross demand	Combined total: Time	Reserve city banks: Gross demand	Reserve city banks: Time	Country banks: Gross demand	Country banks: Time
January 1947	$4,786,948	$510,956	$2,293,445	$325,735	$2,493,503	$185,221
January 1948	5,319,138	557,571	2,527,706	349,429	2,791,432	208,142
September 1948	5,203,768	589,519	2,508,252	378,943	2,695,516	210,576
October 1948	5,247,519	592,462	2,506,619	379,873	2,740,900	212,589
November 1948	5,407,874	594,125	2,584,489	379,905	2,823,385	214,220
December 1948	5,427,633	595,339	2,613,198	382,118	2,814,435	213,221
January 1949	5,430,929	607,167	2,612,025	390,682	2,818,904	216,485

Reports of bank debits from 24 cities in the District showed a decrease during January of 9 percent as compared with December 1948 but an increase of about 6 percent over the comparable month last year. All reporting cities in the District except Austin and Laredo reported a lower volume of bank debits during January than in the preceding month. Declines ranged from relatively insignificant in Tyler to as high as 20 percent in Fort Worth, while increases reported by banks in Austin and Laredo were 31 percent and 3 percent, respectively. The annual rate of turnover of deposits during January also was somewhat lower than during the preceding month and fractionally lower than in January 1948. These figures reflect seasonal trends, for it is customary for bank debits to decline somewhat during the first month of the new year and for the turnover of bank deposits to slow somewhat. The most rapid rates of turnover of bank deposits were reported from Dallas, Austin, and Houston, which reported figures on an annual rate basis ranging from 18.0 in Dallas to 15.6 in Houston.

BANK DEBITS, END-OF-MONTH DEPOSITS, AND ANNUAL RATE OF TURNOVER OF DEPOSITS

(Amounts in thousands of dollars)

City	Debits*: Jan. 1949	Debits*: Pctg. change over Jan. 1948	Debits*: Pctg. change over Dec. 1948	End-of-month deposits*: Jan. 31, 1949	Annual rate of turnover: Jan. 1949	Annual rate of turnover: Jan. 1948	Annual rate of turnover: Dec. 1948
Arizona: Tucson	$ 61,230	— 7	— 6	$ 88,472	8.3	9.2	8.9
Louisiana:							
Monroe	38,073	4	— 7	43,024	10.2	10.2	11.0
Shreveport	148,499	9	— 6	162,668	10.8	10.4	11.3
New Mexico: Roswell	15,365	— 3	—14	18,856	9.5	9.8	10.6
Texas:							
Abilene	32,172	— 9	—14	42,456	9.1	10.1	10.6
Amarillo	88,455	— 5	—10	83,686	12.5	13.1	13.7
Austin	153,611	15	31	108,475	17.4	15.5	13.7
Beaumont	100,856	— 1	— 5	102,497	11.9	12.4	12.5
Corpus Christi	78,440	— 6	— 5	78,680	11.8	13.4	12.2
Corsicana	11,889	— 6	— 9	20,606	6.8	7.4	7.4
Dallas	1,140,000	8	—12	742,122	18.0	18.0	20.4
El Paso	133,211	— 1	—10	118,955	13.3	13.4	15.1
Fort Worth	317,418	— 3	—20	291,285	12.8	14.3	15.8
Galveston	78,223	25	—10	95,327	9.7	8.2	10.7
Houston	1,210,557	16	— 7	927,761	15.6	15.0	16.7
Laredo	18,988	8	3	22,811	10.2	10.3	10.0
Lubbock	66,817	—20	—13	67,954	11.5	13.9	13.2
Port Arthur	35,945	3	— 8	40,223	10.8	10.2	11.8
San Angelo	28,831	—12	—11	39,092	8.6	10.2	9.5
San Antonio	255,127	— 5	— 7	318,080	9.5	10.1	10.1
Texarkana‡	15,819	2	— 6	23,200	8.0	8.0	8.6
Tyler	44,797	5	— *	50,380	10.2	9.8	10.0
Waco	46,908	—14	—15	67,908	8.4	10.0	10.0
Wichita Falls	57,377	8	—13	81,843	8.3	8.2	9.5
Total—24 cities	$4,178,608	6	— 9	$3,636,361	13.6	13.7	14.9

*Indicates change of less than one-half of one percent.

*Debits to deposit accounts except interbank accounts.

*Demand and time deposits at the end of the month include certified and officers' checks outstanding but exclude deposits to the credit of banks.

‡This figure includes only one bank in Texarkana, Texas. Total debits for all banks in Texarkana, Texas-Arkansas, including two banks located in the Eighth District, amounted to $26,330.

Changes in the condition of the Federal Reserve Bank of Dallas during the month ended February 15 showed a decline in Federal Reserve notes in actual circulation from $613,207,000 to $599,612,000 and a decline in member bank reserve

deposits from $985,505,000 to $944,521,000. The return flow of currency this year was similar to that of a year ago with respect to timing, although the volume was slightly larger. This bank's holdings of United States Government securities increased only very slightly during the month, with the consequence that the increase in total earning assets amounted to only $1,738,000.

CONDITION OF THE FEDERAL RESERVE BANK OF DALLAS

(In thousands of dollars)

Item	Feb. 15, 1949	Feb. 15, 1948	Jan. 15, 1949
Total gold certificate reserves	$702,540	$549,737	$706,893
Discounts for member banks	1,000	5,800	0
Foreign loans on gold	6,064	4,481	6,169
U. S. Government securities	986,282	938,062	965,439
Total earning assets	973,346	948,343	971,608
Member bank reserve deposits	944,521	824,143	985,505
Federal Reserve notes in actual circulation	599,612	601,575	613,207

SAVINGS DEPOSITS

Eleventh Federal Reserve District

City	Number of reporting banks	January 31, 1949: Number of savings depositors	January 31, 1949: Amount of savings deposits	Percentage change in savings deposits from Jan. 31, 1948	Percentage change in savings deposits from Dec. 31, 1948
Louisiana: Shreveport	3	32,701	$ 25,085,141	—2.4	0.5
Texas:					
Beaumont	3	12,025	6,156,816	— 4.6	— 0.1
Dallas	8	140,888	78,269,840	— 0.8	— 0.4
El Paso	2	31,849	22,479,808	— 3.7	— 0.01
Fort Worth	4	43,344	34,989,501	— 0.8	0.2
Galveston	4	23,148	21,264,470	— 1.6	— 0.7
Houston	8	101,736	73,673,852	3.2	— 0.2
Lubbock	2	1,623	3,609,094	80.7	— 1.5
Port Arthur	2	5,745	4,683,882	— 5.7	— 0.4
San Antonio	5	39,479	45,324,753	— 5.4	— 0.8
Waco	3	10,302	10,047,718	3.4	— 1.9
Wichita Falls	3	7,325	4,464,330	— 3.0	— 1.7
All other	55	63,181	54,375,281	— 1.1	— 0.2
Total	102	513,346	$384,424,486	— 0.6	— 0.3

During January, sales and redemptions of savings bonds in this District and in the United States were considerably larger than those of December. Of course, that is typical for this time of year, for during January limit purchases for the year of Series E bonds are made by large investors, while redemptions usually are larger due to the need for funds to meet tax payments. Sales of savings bonds in the District during January amounted to $24,985,000, while redemptions totaled $22,038,000. The excess of sales over redemptions in this District in January amounting to $2,947,000 compares with $5,717,000 in January a year ago. During 1948 Texas was one of 13 states to sell more E bonds than during the preceding year.

INDUSTRY

Production of crude petroleum during January fell to 5,435,000 barrels per day in the United States and 2,591,000 barrels per day in the Eleventh Federal Reserve District. The decline from December of 193,000 barrels per day for the Nation was concentrated largely in the Eleventh District, where the drop was 170,000 barrels per day. Production in the Nation was 115,000 barrels daily higher than during the corresponding month a year earlier, but in the District, was 23,000 barrels daily less than a year ago. While decreases in production have occurred in several states in recognition of the fact that crude oil production was exceeding demand, the major cutbacks have been in Texas. In that State the railroad commission reduced sharply the production allowables for January and made further large reductions in the February and March allowables. The Texas allowable production in March, amounting to 2,216,000 barrels daily, represents a decrease of about 515,000 barrels daily from the all-time peak reached in December 1948.

CRUDE OIL PRODUCTION—(Barrels)

Area	January 1949: Total production	January 1949: Daily average production	Increase or decrease in daily average production from Jan. 1948	Increase or decrease in daily average production from Dec. 1948
Texas:				
District 1	836,400	26,981	1,425	— 921
2	5,029,400	162,239	— 5,859	— 16,372
3	14,063,600	453,663	— 42,592	— 48,108
4	7,005,300	225,977	— 29,663	— 23,810
5	1,433,400	46,239	2,195	— 5,347
6	8,999,300	290,300	— 4,171	829
Other 6	3,575,500	115,339	— 5,488	— 9,256
7b	1,945,050	62,744	19,842	639
7c	1,502,950	48,482	5,709	— 1,786
8	21,015,350	677,915	19,246	— 63,696
9	4,304,350	138,850	— 3,516	— 5,469
10	2,766,150	89,231	— 2,805	147
Total Texas	72,476,750	2,337,960	— 45,677	—173,150
New Mexico	4,165,550	134,372	11,446	350
North Louisiana	3,669,750	118,379	11,210	2,679
Total Eleventh District	80,312,050	2,590,711	— 23,021	—170,121
Outside Eleventh District	88,180,650	2,844,537	138,080	— 22,616
United States	168,492,700	5,435,248	115,059	—192,737

SOURCE: Estimated from American Petroleum Institute weekly reports.

Stocks of crude oil in the Nation at the end of January reached a new postwar high 10 percent above a year earlier, and in the Eleventh District, attained the highest level in more than 10 years. Gasoline stocks by the end of January both in the Nation and the District approximated levels attained last year only at the early spring seasonal peak, being 12 percent higher than a year earlier in the Nation and 9 percent in the District. The mild winter throughout much of the eastern part of the Nation, which has held down the demand for fuel oil during the heavy consuming season, together with the high level of production, has resulted in the accumulation of large stocks of petroleum products. Stocks of gas-oil and distillate fuel oil were up 66 per cent in the Nation and 112 percent in the District, while residual fuel oil stocks were up 66 percent in the Nation and 59 percent in the District. As a result of excessive stocks of petroluem products, which now tax storage capacity, refiners are curtailing operations and seeking to reduce yields of fuel oils, as well as to develop new uses for these products. Daily average crude oil runs to refinery stills in the United States declined only 1 percent from December to January, while the decrease in this District amounted to 4 percent. Operations during January, however, were still above those a year ago, the daily rate being 5 percent higher in the Nation and 3 percent in the District.

Reflecting the heavy stocks and the lower-than-anticipated demand, prices of refined products, particularly fuel oil, have been soft for several weeks and some companies recently announced further reductions on heavy fuel oils. While prices of crude oil generally appear to be firm, the premiums above posted prices which were common last year have virtually disappeared.

Drilling activity in 1948 as measured by well completions set a new record of 36,491 wells in the Nation, while the total of 14,036 wells for the District was second only to the 1937 record. The 1,370 wells completed in the District during December exceeded by 367 the number of wells completed in the corresponding month of the previous year.

Forecasts for the year 1949 made by the *Oil and Gas Journal* indicate that, compared to 1948, crude oil production in the Nation may increase by 2 to 3 percent, and crude oil runs to refinery stills, by about 5 percent. Well completions are expected to total about 6 percent fewer in the Nation and 5 percent fewer in the District, although total footage drilled should increase fractionally due to deeper wells. Estimates of the Nation's proved reserves of crude oil and condensate and other natural gas liquids at the beginning of 1949 were 27,325,000,000 barrels, representing an increase of 1,341,000,000 barrels or 5 percent as compared to a year earlier. Reserves in the District were estimated at 16,771,000,000 barrels, an increase of 914,000,000 barrels or 6 percent over those a year earlier, giving the District 61.3 percent of the Nation's reserves.

VALUE OF CONSTRUCTION CONTRACTS AWARDED

(In thousands of dollars)

	January 1949	January 1948	December 1948
Eleventh District—total	$ 44,772	$ 55,691	$ 81,465
Residential	14,597	25,083	27,113
All other	30,175	30,608	54,352
United States*—total	482,984	615,206	694,023
Residential	159,128	238,098	256,746
All other	323,856	377,108	437,277

*37 states east of the Rocky Mountains.

SOURCE: F. W. Dodge Corporation.

The value of construction contracts awarded in the District in January 1949 fell to $45,000,000, or a little more than half of the near-record December rate and 20 percent below the rate in January 1948. All major types of construction participated in the decline. January awards were the lowest in four months and reflect chiefly a normal seasonal decline, intensified to some extent by uncertainty in the construction and general business outlook. However, contract awards during the three months November 1948-January 1949 totaled $180,000,000, which is 6 percent higher than for the like period in 1947-48 and is the largest three-month total since July-September 1948.

Construction contract awards in the 37 eastern states also fell during January and reached the lowest value in 23 months, with residential awards declining to the lowest level in nearly three years.

Nonfarm employment in Texas at mid-February was estimated by the Texas Employment Commission at about 2,310,000 persons, or about 30,000 persons less than the seasonal peak at mid-December. Only part of this reduction was reflected in increased unemployment, since many of the workers laid off had accepted temporary employment only during the Christmas shopping period. However, severe weather led to more than the usual seasonal curtailment of employment in construction. These declines were partially alleviated by a rise of employment in manufacturing, largely due to a continuance of expansion in aircraft production.

BUILDING PERMITS

City	January 1949 Number	January 1949 Valuation	Percentage change in valuation from Jan. 1948	Percentage change in valuation from Dec. 1948
Louisiana: Shreveport	249	$ 787,377	—10	51
Texas:				
Abilene	37	499,816	49	27
Amarillo	67	326,825	—59	—38
Austin	226	1,775,292	—15	33
Beaumont	245	737,461	28	35
Corpus Christi	257	894,658	—45	103
Dallas	661	5,809,694	—28	133
El Paso	176	750,580	—26	59
Fort Worth	348	1,632,046	26	—39
Galveston	91	653,972	111	323
Houston	470	3,876,250	—74	—51
Lubbock	47	256,118	—64	—84
Port Arthur	101	226,955	161	12
San Antonio	940	2,512,840	—29	— 2
Waco	105	403,190	—85	—24
Wichita Falls	40	114,285	—70	—84
Total	4,060	$21,257,359	—46	— 8

DOMESTIC CONSUMPTION AND STOCKS OF COTTON—(Bales)

	January 1949	January 1948	December 1948	August 1 to This season	January 31 Last season
Consumption at:					
Texas mills	12,681	13,484	12,790	76,779	75,444
United States mills	674,463	860,704	680,670	4,204,057	4,645,463
U. S. Stocks—end of month:					
In consuming estabm'ts	1,627,055	2,229,229	1,649,284	.....	.....
Public stg. & compresses	8,213,189	5,105,438	8,811,478	.....	.....