B955

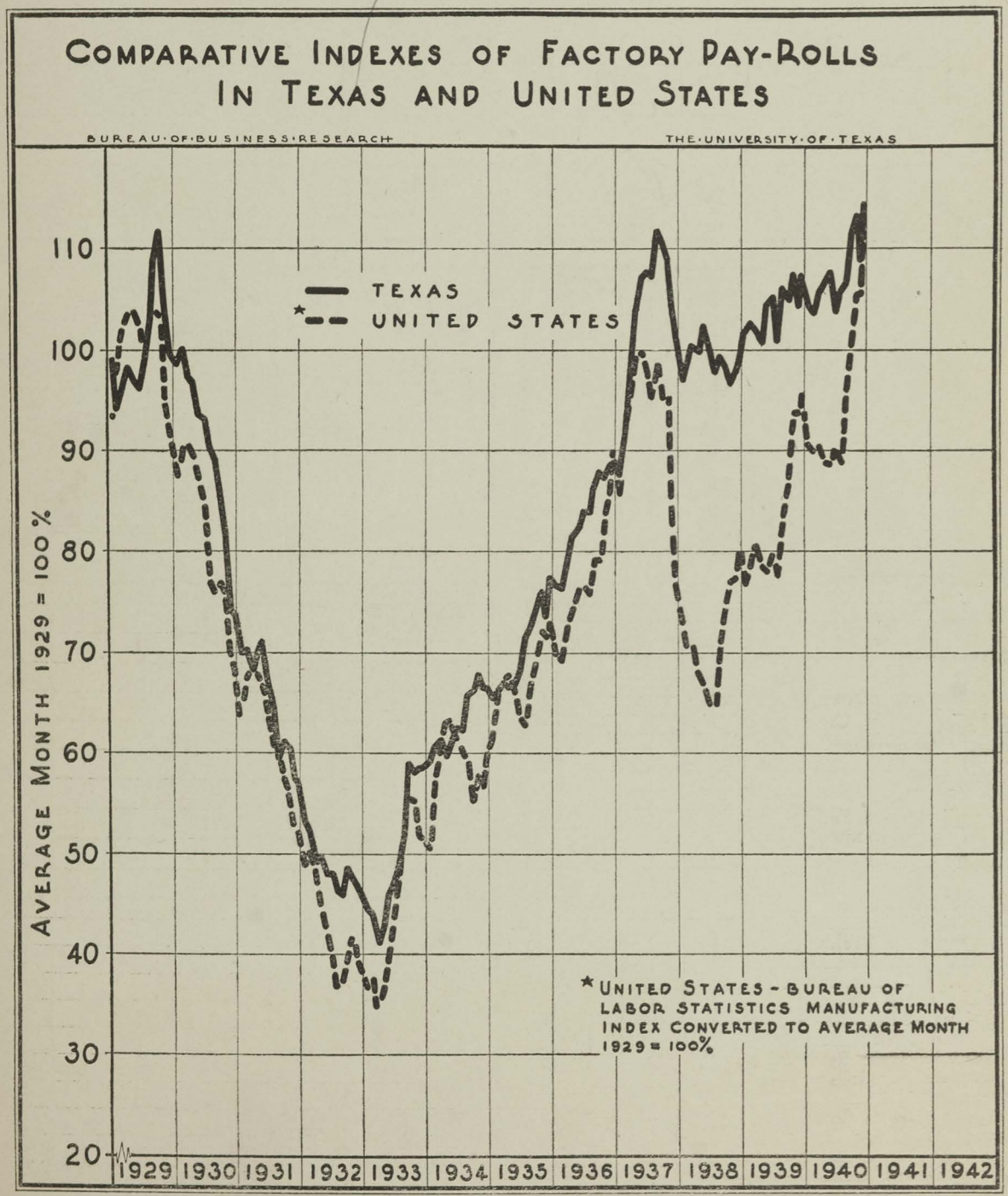
TEXAS BUSINESS REVIEW

Bureau of Business Research
The University of Texas

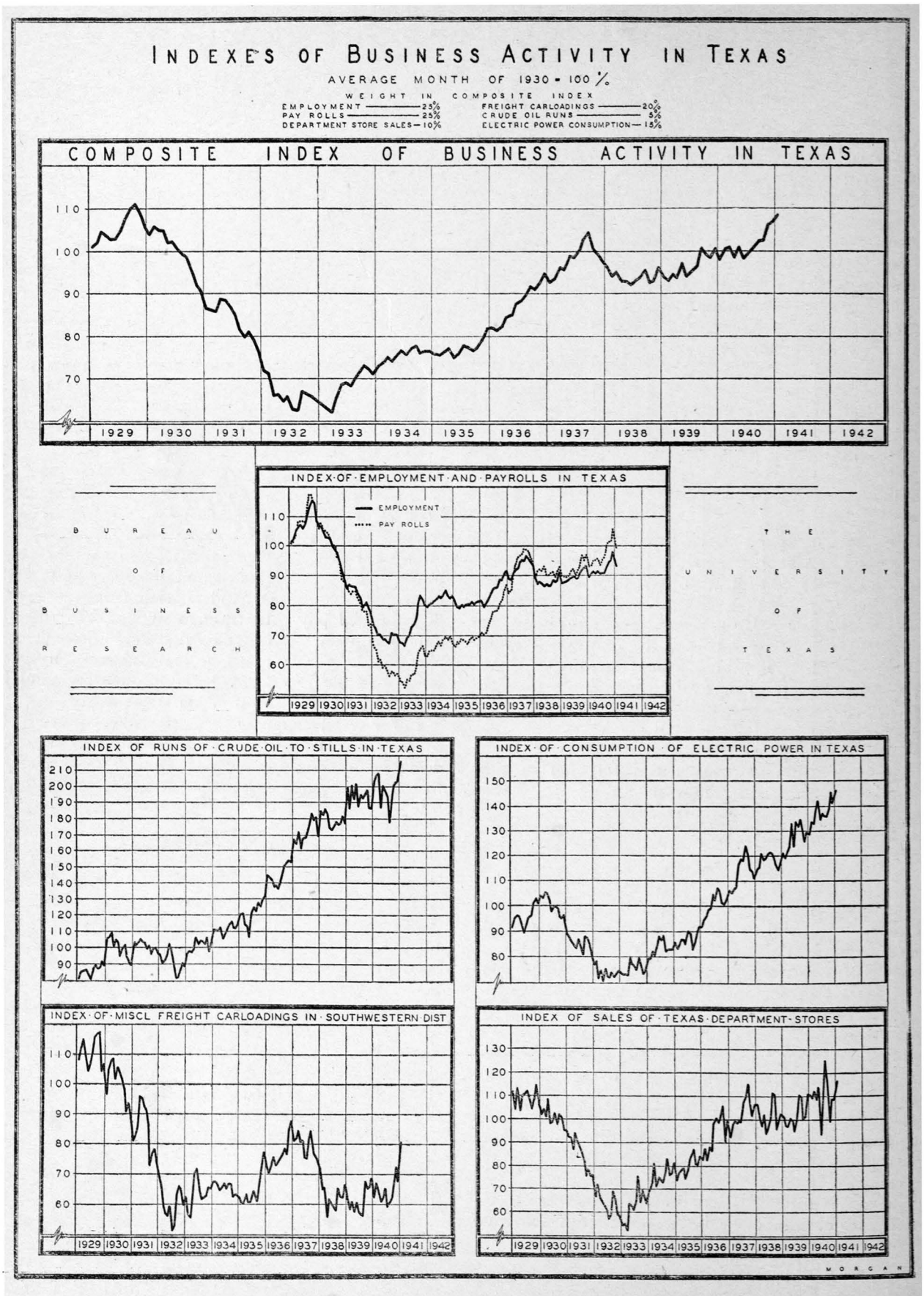
THE UNIVERSITY OF TEXAS
MAR 3 1941
THE LIBRARY

Vol. XV, No. 1 February, 1941

A Monthly Summary of Business and Economic Conditions in Texas and the Southwest
Bureau of Business Research, The University of Texas, Austin, Texas
Entered as second class matter on May 7, 1928, at the post office at Austin, Texas, under Act of August 24, 1912



TEN CENTS PER COPY ONE DOLLAR PER YEAR


INDEXES OF BUSINESS ACTIVITY IN TEXAS
AVERAGE MONTH OF 1930 = 100 %
WEIGHT IN COMPOSITE INDEX
EMPLOYMENT — 25%
PAY ROLLS — 25%
DEPARTMENT STORE SALES — 10%
FREIGHT CARLOADINGS — 20%
CRUDE OIL RUNS — 5%
ELECTRIC POWER CONSUMPTION — 15%
COMPOSITE INDEX OF BUSINESS ACTIVITY IN TEXAS
110
100
90
80
70
1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941 1942
BUREAU OF BUSINESS RESEARCH
INDEX OF EMPLOYMENT AND PAYROLLS IN TEXAS
EMPLOYMENT
PAY ROLLS
110
100
90
80
70
60
1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941 1942
THE UNIVERSITY OF TEXAS
INDEX OF RUNS OF CRUDE OIL TO STILLS IN TEXAS
210
200
190
180
170
160
150
140
130
120
110
100
90
INDEX OF CONSUMPTION OF ELECTRIC POWER IN TEXAS
150
140
130
120
110
100
90
80
INDEX OF MISCL FREIGHT CARLOADINGS IN SOUTHWESTERN DIST
110
100
90
80
70
60
1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941 1942
INDEX OF SALES OF TEXAS DEPARTMENT STORES
130
120
110
100
90
80
70
60
1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941 1942
MORGAN

Business Review and Prospect

General Business

Industry and trade in the country at large continue their gradual but consistent upward tendency. Barron's index, adjusted for population growth and long time trend, stood at 98 on February 15, the highest point reached in more than a decade. Last year on the corresponding date the index was 82.1. Thus the gain over last year at this time is nearly 20 per cent. Inasmuch as a year ago the trend of Barron's business index was downward whereas now it is upward, the margin of gain promises to widen even more during coming weeks. Not until early summer, when year to year comparisons will be made with the early stages of the national defense stimulated industrial activity of 1940, is there likely to be a tendency for the margin of gain over a year to diminish. How narrow this margin will become toward the end of the year depends upon the progress which will be made in plant expansion to meet both authorized defense expenditures and normal economic demands.

At present, in spite of the high rate of industrial activity, the backlog of orders is increasing. Sales at retail are gaining momentum as pay rolls rise and farm income increases, and for the year 1941 retail sales are expected to reach an all time peak even well above that of 1929. These dollar sales, in the main, will reflect an increase in physical volume rather than higher prices, for no appreciable rise in retail prices is expected for some months at the earliest. Thus the plane of living of workers promises to rise, and this situation could continue indefinitely provided costs are kept under control and speculative factors are held in check. To achieve this result will require statesmanship of the highest order on the part of the government, labor, and industrial leadership.

Texas Business

Reflecting the sharp rise in national nonagricultural pay rolls resulting from the tremendous impact of the Federal Defense Program on the heavy industries in the Great Lakes Area, the Northeast, and the Pacific Coast States, Texas industry and trade are beginning to show definite upward tendencies. The margin of gain of the Texas composite business index over a year ago is, accordingly, growing wider, and all indications point to a continuation of this development until early fall at least. By next autumn year to year comparisons will be made with a rapidly increasing base figure, and the composite business index will then do well to maintain the margin of gain over 1940 which it will have attained by that time. However, if the year to year margin of gain were but to remain constant during next fall, it would indicate a rate of business activity well above any ever before reached in this State.

JANUARY BUSINESS INDEXES IN TEXAS

	Jan. 1941	Jan. 1940	Dec. 1940*
Employment	93.3	89.9	98.0
Pay Rolls	99.6	92.8	106.2
Miscellaneous Freight Carloadings	80.7	62.8	68.2
Crude Runs to Stills	216.0	203.2	203.9
Department Store Sales	116.6	110.1	108.9
Electric Power Consumption	146.5	128.9	141.2
COMPOSITE INDEX	108.8	98.7	107.0

*Revised.

On the cover page of this issue of the Review is a graphic comparison of changes in industrial pay rolls in Texas and in the United States as a whole. The striking feature of the chart is the relative stability of pay rolls in Texas in contrast with the wide swing in national pay rolls during the period from 1937 to date. Since the peak of monthly expenditures for National Defense is still some distance ahead and because of the fact that the great bulk of these expenditures will continue to be made in the industrial areas of the country, relative stability in pay rolls in Texas as compared with those of the country at large will continue for an indefinite period. In the meantime, the increasing domestic demand for consumer goods arising from the expansion of industrial pay rolls throughout the Nation will have a most salutary effect on the price and volume of marketings of many Texas products—agricultural, mineral, and forest—all of which the State produces in abundance. The rising trend of income from these sources will, moreover, be greatly augmented by the upward trend of pay rolls from industries within the State itself causing local demands for the products of Texas farms, mines, and forests in conjunction with the demands originating outside of the State.

Farm Cash Income

Income from agriculture in Texas during 1941 promises to be the largest in several years. Seldom in the history of the State has the moisture supply been more favorable at this time of year, and this situation is currently being reflected in range and livestock condition. According to the Agricultural Marketing Service of the United States Department of Agriculture, condition of Texas cattle ranges on February 1 was thirteen points above that of the corresponding month last year, and condition of sheep and goat ranges was ten points higher. Comparison of current condition of the livestock with that of a year ago also was highly favorable. Inventories of cattle in Texas increased from 6,677,000 on January 1, 1940, to 6,944,000 on January 1, 1941; sheep from 10,069,000 to 10,620,000; goats from 3,300,000 to 3,498,000; while hogs declined from 2,293,000 to 1,926,000. The favorable range and breeding stock conditions, should result in low mortality and sturdy

For Other Texas Data, See Statistical Tables at the End of This Publication

offspring (calves, lambs, and kids) during the coming season, while later in the year this situation should be reflected in larger marketings of livestock, wool, and mohair.

Contributing still further to the favorable outlook for growing income from livestock and livestock products in Texas is a definitely rising trend of prices of beef, lamb, pork, wool and mohair. Production and prices of Texas dairy and poultry products also show a definite upward tendency.

Although farm cash income for the State as a whole is normally at the lowest of the year during the winter months, January farm cash income this year, as computed by this Bureau, exclusive of government subsidies, was more than twenty-one million dollars as against less than seventeen million dollars during January 1940, an increase of more than 26 per cent. It is perhaps not necessary to point out that a high percentage increase has far less economic significance at this season of year than would be the case were such a percentage increase to occur in a month of normally high marketings as, for example, in the fall of the year. It is indicative, however, of growing strength in Texas agricultural income arising from factors mentioned at the beginning of this article.

F. A. BUECHEL.

INDEX OF AGRICULTURAL CASH INCOME IN TEXAS

Districts	Jan. 1941	Dec. 1940	Jan. 1940	Actual Cash Income Jan. 1941	Actual Cash Income Jan. 1940
				(000 Omitted)	
1–N	59.2	54.8	55.4	$ 1,812	$ 1,696
1–S	125.2	104.3	85.1	2,571	1,748
2	100.2	88.1	64.5	2,533	1,664
3	113.5	92.8	94.9	1,154	961
4	87.3	93.9	66.6	2,724	2,061
5	72.4	113.1	40.1	760	421
6	121.7	132.1	127.6	1,452	1,522
7	155.7	69.5	144.5	1,552	1,441
8	120.2	83.5	95.2	1,378	1,091
9	180.8	149.0	108.0	2,110	1,243
10	125.4	72.0	130.7	494	506
10–A	154.4	110.6	139.9	2,874	2,605
STATE	109.3	94.1	86.6	$21,414	$16,959

NOTE: Farm cash income as computed by this Bureau understates actual farm cash income by from 6 to 10 per cent. This situation results from the fact that means of securing complete local marketings, especially by truck, have not yet been fully developed. In addition means have not yet been developed for computing cash income from all agricultural specialties of local importance in scattered areas throughout the State. This situation, however, does not impair the accuracy of the *indexes* to any appreciable extent.

Texas Industry in Perspective

AWAKENING AN ECONOMIC EMPIRE

The outstanding national position of Texas as a leading agricultural and range livestock and lumber producing State has long been recognized; it was the rise of the State's gigantic oil industry seconded by natural gas that initiated industrial developments on a wide scale in Texas during the 1920's. Concomitant with the rise of oil, the key development of which stems from the famed Spindletop discovery of 1901, has come a tremendous transformation of the structure of the economic life of the State.

In 1900 Texas had a population of 3 million; today it has more than twice as many people, 6,414,824. In 1900 some 83 per cent of the population was rural and no city in the State had a population of as much as 60,000! Today the urban population is 45.4 per cent of the State's total. Even though railways were the chief means of intra-state transportation in 1900, the railway mileage since then has increased by nearly 70 per cent—to more than 17,000 miles. In 1900 Texas produced less than a million barrels of oil—a total of 836,000 barrels. In 1940 Texas produced 492,565,000 barrels—nearly 590 times as much as in 1900.

For a decade now Texas has produced nearly 38 per cent of the nation's total oil output and in 1940 Texas alone produced more oil than any two other states! Moreover, Texas has now 53.1 per cent of the nation's known oil reserves; it has produced less than 40 per cent of its grand total of known oil, and it is the only State whose known reserves are greater than total production to date. In fact, Texas' known reserves are nearly 70 per cent greater than the volume of oil thus far produced in Texas. The economic importance of oil and gas to Texas could hardly be overemphasized in the light of what these industries meant to the State during the decade of the 1930's.

In order to get at the comparative position of Texas oil output, the following data are presented:

1) Texas' total oil production of 6,580,162,000 barrels as of January 1, 1941 was more than 38 per cent of total United States output down to that time, not counting Texas.
2) During the past decade alone Texas has produced 64 per cent of the State's total oil output to date; that is, total oil production in Texas down to the end of 1930 was only 36 per cent of what the total was at the end of 1940.
3) Since the middle of 1933 Texas has produced as much oil as it had produced up to the middle of 1933; that is, Texas has produced 50 per cent of its total oil output of 6,580,162,000 barrels of oil during the past seven and a half years.

More recently, particularly during the past decade, not only have the oil and gas industries grown at a rapid pace but there has come in the short space of a few years, and during the Great Depression a veritable chemical revolution which now is centering national interest upon the potentialities of the chemical industry in Texas. But even with these developments Texas remains a frontier for a highly diversified and exceedingly important industrial growth. Even very recently there is crystallizing on a broad base a new conception as to what varied and important potentialities Texas has as bases for further industrialization. These new developments are part and parcel of a greatly accelerated move-

ment which through decentralization and geographic dispersion of plants is transforming the American industrial scene.

Against this background is to be viewed what is virtually a new industrial revolution in the State—represented in continued expansion in oil and gas, particularly the chemical aspects of oil, the growth of smelting and refining operations, the progressive expansion of chemical industries, the coming of an important pulp and paper industry, and more recently the growth of shipbuilding and airplane plants, and most recently, that of a steel industry—the first of its kind in the whole Southwest.

Whatever the industry concerned, it is the vast reserves of the varied natural resources and the large supplies of natural gas that stand foremost in attracting plants to Texas. Modern industry requires vast supplies of raw materials in combination with adequate low cost electric or heat energy.

The scope of Texas is so extensive and includes so vast a variety of conditions and such a diversity of resources significant to modern industrialization that mere geographic extent has to be recognized as one of the outstanding economic features of the State.

Other than size, three things make Texas stand out in any sort of economic survey of the nation: these are:

(1) its striking diversity in rich natural resources, mostly occurring on a grand scale—its large areas of productive agricultural soils, its capacity to grow timber, both rapidly and in large amount, its widespread grazing lands; its magnificent petroleum and natural gas resources and reserves; its varied and extensive non-metallic resources now furnishing the raw materials for a youthful but rapidly expanding chemical industry in Texas;
(2) its range of climatic features which give variety to the Texas landscape and provide its generally open winters and sunshiny winter weather which are so sharply in contrast with winter conditions farther north;
(3) its extensive coast line on the Gulf of Mexico which brings to a very large proportion of Texas the highly important advantages of low-cost deep water transportation.

In addition to these features the State has an adequate labor supply and it possesses a well developed system of transportation, of railways, highways, and air lines.

The capacity of Texas to produce agricultural and livestock products is generally well known; the diversity of the raw materials thus provided as bases for substantial industries merit considerable re-emphasis. The capacity of the State's forest lands to yield both pines and hardwoods as raw materials for the rapid growth in the production of pulp and paper and plastics requires mention even in a brief summary, for Texas is also one of the important timber producing states of the South. The leading position Texas has attained in the petroleum industry and in natural gas production ranks as one of the outstanding major features in American industrial development during the past 15 years. The position petroleum refining and the natural gas industry now occupy in the chemical industry, the manner in which chemical developments are transforming these industries, and the large volume of raw materials the petroleum and natural gas industries are now able to supply chemical industries with, are of immense significance in gaining a perspective of how large a part the petroleum industry and natural gas will play in American economy in the near future.

The chemical phase of the petroleum industry undoubtedly is being stimulated considerably by national defense preparations. Petroleum hitherto has been considered mainly as a raw material for motor fuel; and as coal tar and nitrogen emerged from World War I as basic chemical materials in a greatly stimulated American chemical industry, it is reasonable under the circumstances to feel that petroleum will henceforth be considered an essential chemical raw material in the modern American chemical industry.

Another reflection of the strides being made in using petroleum as a basic chemical raw material is to be seen in the recent announcement of the long awaited story of successful synthesis of glycerine from petroleum.

Every modern oil refinery today is a highly complex and up-to-date chemical plant; the revolution in oil refining operations during the past few years is too complicated to be more than mentioned here. Besides engineering equipment of the newest developments in alloy steel, besides using the most modern and revolutionary chemical processes in its operations, the refinery industry (like the pulp and paper industry) is a large consumer of a great variety of chemical materials—of such substances as sulphuric acid, ammonia, caustic soda, soda ash, calcium chloride, litharge, copper sulphate, fullers' earth, a whole series of catalysts, water-softening compounds, tetra-ethyl lead, and such things as inhibitors and lubricating-oil additions.

The developments in and the capacity for further expansion in the heavy chemicals and the pulp and paper industry are manifestations of trends that unquestionably will be of tremendous importance in Texas industry in the next few years. For years Texas has been the leading State in petroleum production, petroleum refining, and in natural gas production; it is now becoming a leading producer of chemicals. The chemical industry is crystallizing the immense significance of those non-metallics in which Texas is well supplied; at the same time it is creating a new conception of the economic importance to Texas of natural gas as a fuel and of the value of natural gas and petroleum refinery gases as bases for the further development of chemical products. The expanding pulp and paper industry of the South is creating new demands for the chemicals it uses in large volume.

The physical set-up of natural resources and earth conditions are of an order not duplicated elsewhere.

Texas has enormous supplies of such resources as petroleum, natural gas, salt and brines, sulphur, lime, gypsum, potash, clays, lignite, and it is well equipped relatively as to forest resources, water supplies, and possibly glass sands.

Owing to its geographic position, both with respect to the North American continent and the Gulf of Mexico,

and to its ample supply of fuels, Texas has great advantages in smelting and refining of ores.

Thus, an abundance of natural resources which makes a supply of diverse raw materials conveniently available gives to Texas an attraction for varied industries, the consequences of which are already manifested in the industrial growth of the State particularly during the past decade. Some of the more important items in recent developments may be summarized.

It may be reëmphasized that the developments taking place in Texas during the past 20 years are reflections of movements operating on a wide national scale. Forces of decentralization and industry dispersion have brought the march of industrialization southward and southwestward.

The economic bases for industry development in the Southeast are in general quite in contrast with those of the Southwest; while the new developments are going on apace in Texas, an industrial revolution of a different type has been taking place in the Southeast—within the Deep South and along the Gulf and Atlantic coasts. An analysis of industry developments in the Southeast will be presented in a separate article. This article emphasizes fundamental movements and trends rather than merely the quantitative aspects in economic development.

Chemical Industry in Texas

It was Southern Alkali's $7,500,000 ammonia-soda plant at Corpus Christi, opened in October, 1934, that led the way in the chemical revolution in Texas. This plant has from the first produced heavy alkalies, soda ash and caustic soda; later, in 1938, a chlorine producing unit costing some $2,000,000 was added.

The added installation of the chlorine plant was due to the rapidly expanding demand for chlorine created by the bleached sulphate pulp industry in the South, for water purification, and as a material used in the manufacture of organic solvents and other chemical products.

Location on tidewater, the availability of near-by natural gas in large quantities, the occurrence of salt and lime all were factors in the decision to construct this plant at Corpus Christi.

Dow Chemical's new plant at Freeport, to cost some $15,000,000, will produce magnesium from magnesium chloride in sea-water. Dow's reason for coming to Texas and to Freeport was given by officials as due to the "availability of an unlimited supply of raw materials." Production has already begun and is to be more than 10,000,000 pounds of metal annually. Since 1915 Dow has been producing magnesium from subsurface brines at Midland, Michigan. Its plant facilities at Midland have grown so that now Dow can produce annually some 12,000,000 pounds of magnesium there. The large actual and even greater potential demand for magnesium in properly made alloys resulted in Dow's coming to Texas.

It is estimated that a cubic mile of sea-water contains 175,000,000 tons of a variety of materials including gold, silver, copper, iron, aluminum, magnesium, potassium, calcium, radium, strontium, sulphur, chlorine, bromide, iodine, and sulphur. Also the potential value of all of these substances contained in a cubic mile of sea-water has been placed by Paul Reed at the enormous sum of some 5 billions of dollars! Reed, writing in *The Oil and Gas Journal* of November 28, 1940, says: "Operating the Freeport plant at a daily capacity of 360,000,000 gallons of sea-water daily [at Wilmington 200,000 gallons of seawater can be treated per minute, or 288,000,000 gallons daily] it would take more than 800 years to extract the amount of magnesium (5,700,000 tons) contained in 1 cubic mile of sea-water."

Dow has purchased a tract of 800 acres, with 3 miles of frontage on the Gulf. Bromine, an essential ingredient in the manufacture of anti-knock gasoline, will be recovered as a by-product of the process, the bromine plant of Ethyl-Dow on Kure Beach, near Wilmington, North Carolina, being duplicated at Freeport, so it is reported. Chlorine will be produced, to be used in the process of obtaining bromine from the sea-water. It has been stated that Dow at Freeport will also produce synthetic organic chemicals.

Carbide and Carbons Chemicals Corporation, a subsidiary of Union Carbide and Carbon Corporation, has acquired a tract of 200 acres and on June 1, 1940, it is reported, started construction of a new chemical plant at Texas City at an expenditure of between $5,000,000 and $10,000,000 or perhaps even more, to be ready for operation early in the summer of 1941. The plant is to produce a great variety of synthetic organic chemicals for industrial purposes from oil-refinery gases, the latter to be obtained from the near-by Pan-American Refining Corporation's refinery. This arrangement for obtaining its raw materials is similar to that of the Carbide and Carbon Chemicals Corporation's plant at Whiting, Indiana, where gases are obtained from the nearby refinery of Standard Oil Company of Indiana. It may be noted here that the Pan-American refinery at Texas City is new from the ground up, that it is said to utilize the most modern technology and equipment and that it is now constructing a hydroforming plant to make high octane aviation gasoline.

Union Carbide and Carbon Corporation is a major producer of synthetic organic chemicals from natural gas and oil refinery gases, through hydro-carbon processes worked out in the company's plant in the Kanawha Valley of West Virginia.

It would indeed be difficult to overemphasize the potentialities of the chemical industry based on raw materials from petroleum and natural gas. It has authoritatively been stated that the production of hundreds of things made through the chemical manipulation of coal tar is now being repeated in other phases of the synthetic organic chemical industry. The oil industry, using chemical technique, is becoming a synthetic organic chemical industry, producing for one thing super-gasoline by reforming petroleum molecules, not unlike the manner in which the coal tar industry makes its line of complex products from coal.

Sidney B. Self in *Barron's*, January 13, 1941, writes:

"Another major division of chemistry that is not new, but which is just beginning to get into full stride, is the production of synthetic organic chemicals from petroleum and from hydrocarbon gases. Petroleum is an even more plentiful raw material for the chemist than coal and is perhaps even more adaptable to chemical operations. The development of new techniques of building molecules to order, and of new processes for oil refining, using the chemist's magic wand, the catalyst, have been a tremendous stimulus to the use of petroleum as a chemical raw material.

"There are now two major developments on the Gulf Coast of Texas by chemical producers to make chemicals from oil and natural gas, one of the new plant of Union Carbide & Carbon Corp., the other the new plant of Dow Chemical at Freeport, which will be a major organic chemical producer, in addition to its production of magnesium from sea water.

"The two plants probably mark the beginning of a major development in this area by these two companies to produce a wide range of organic chemicals. It has been said that Dow's project may eventually be as large as its Midland plant, now the largest single chemical plant in the country.

"Union Carbide, which pioneered in making solvents, industrial alcohol, methanol (wood alcohol) and ethylene glycol (Prestone) from hydro-carbon gases, is now making substantial commercial quantities of butadiene, one of the main ingredients of synthetic rubber, from gases. It is also planning to make other essential raw materials for synthetic rubber from the same sources. Besides this, Carbide has lately assumed a leading position in the plastic field with the growth of its vinyl compounds, and its acquisition of the Bakelite Corp. As part of this program, it is planning to make other important plastic raw materials, including styrene and possibly phenol. Styrene, at present one of the fastest growing plastic materials because of its remarkable insulating qualities, is now made from coal tar. Phenol, or carbolic acid, is one of the materials for making phenolic plastics, first popularized under the name Bakelite."

As to the results of Union Carbide and Carbon's developmental work after many years of research on materials from hydro-carbon gas of the type of acetylene *The Wall Street Journal* of June 6, 1940, stated:

"Shoes and stockings, raincoats and umbrellas, belts and suspenders, not to speak of a thousand gadgets like combs, handbags, toothbrushes and phonograph records, all are going to be made by the ton out of natural gas, via a new group of chemicals called vinyls made by Union Carbide and Carbon Corp.

"Originally only a plastic, used as a molding powder, the forms of vinylite have been varied and improved until it now appears to be a basic new raw material for industry adaptable to a hundred large scale uses."

These vinyls, whether in the form of the plastic Vinylite or as a hosiery yarn called Vinyon, are copolymers of two resins, or plastic materials, vinyl chloride and vinyl acetate. Like du Pont's Nylon, these products are synthetic resins. Dow's newest plastic, vinylidene chloride, the trade name of which is Saran, made from oil and brine belongs to another branch of the remarkable vinyls family.

Diamond Alkali Company through a subsidiary, the Diamond Alkali Company of Texas, has recently taken over the Gulf Coast Chemical Company and will continue to operate it as Diamond's Gulf Coast Chemical Division, with its main office in Houston, it is reported.

The Diamond Alkali Company of Texas has purchased a Dallas site for the construction of a new plant at a cost of some $300,000 which will manufacture silicate of soda and silicate products.

Rust Engineering Company of Pittsburgh will build the plant which will be ready to operate in August this year. This new plant reflects the increasing significance of Texas as a chemical market. Sodium silicate, commonly called water glass, is manufactured from silica sand and soda ash, is used in the making of soap, of corrugated boxes, and in the dairy, paper, textile, and laundry industries.

Diamond Alkali, whose home office is Pittsburgh and its main manufacturing plant at Painesville, Ohio, is in itself or through subsidiaries, a large manufacturer of soda ash, caustic soda, bicarbonate of soda, chlorine, carbon tetrachloride, sodium silicate, bichromate of soda, and of calcium products.

Three plants making sodium sulphate or salt cake from brines of lakes or shallow subsurface strata are in operation in the Texas High Plains. One of these plants some 10 miles south of Monahans, Ward County, is operated by the Ozark Chemical Company of Tulsa. The other two, one near O'Donnell, Lynn County, the other near Brownfield, Terry County, are operated by the Arizona Chemical Company, a subsidiary of the American Cyanamid Company of New York City. These two plants began operations in 1938.

It should be noted that the demand for salt cake has expanded with the growth of the Kraft paper industry in the South, and that this demand has now to be met mainly from domestic sources, as large amounts formerly were obtained from Germany. Matthieson Alkali Works whose ammonia-soda plant at Lake Charles, Louisiana, was established in 1934 simultaneously with Southern Alkali's plant at Corpus Christi announced in 1940 a program of plant expansion involving an expenditure of $1,600,000 which will include facilities for greater output of synthetic salt cake, which is being made at Lake Charles by a new process developed by the Matthieson organization. This synthetic salt cake, according to the Bureau of Mines is a "sintered product of soda ash and sulfur in molecular proportions. . . ."

In August, the Shell Oil Corporation announced plans for the construction of a $500,000 (since placed at $1,000,000) plant on the Houston ship channel to make toluol, the active ingredient of TNT. The decision to erect the plant at Houston was due, according to company officials, to the huge oil resources of the Southwest. The processes used, it may be noted, were worked out in the research laboratories of Shell Development Company at Emeryville, California. The capacity was reported at 2,000,000 gallons of toluol annually, to be made by processes developed in the Shell laboratories. This plant is already in operation. Shell's present method of producing toluol is an extractive process; the company has recently announced the perfection of a new process which is synthetic in principle. By using the second process to supplement the first their output of toluol can be boosted to 10,000,000 gallons—enough to make an annual output of 100,000,000 pounds of TNT. On February 20, Shell Oil Corporation announced the award of a contract for the construction of a plant at its Deer Park refinery for the manufacture of butadiene, a hydrocarbon product used as a basic raw material in the manufacture of and comprising some 75 per cent of one type of synthetic rubber. The cost of this plant has been unofficially estimated at between $2,000,000

and $4,000,000. Shell's plant will have a daily capacity of about 14 tons, whereas the butadiene plant at Baton Rouge, Louisiana, has a daily output of about 5 tons.

In late October, 1940, the federal government awarded an $11,857,000 contract for the erection of a toluol plant at Baytown. This plant, Baytown Ordnance Works, is to be operated by the Humble Oil and Refining Company; it will produce toluol, the active ingredient of high explosives, for the government. The Humble Company will construct a new plant to cost $10,760,000; it will use $1,097,000 to expand its present Baytown refinery. There has been a recent additional allotment of $7,600,000 for operating costs. It is reported that Brown & Root have signed a $300,000 contract to connect the new toluol plant with Humble's Baytown refinery. The new plant is to be built on a 50-acre tract sold by Humble to the government. Additional facilities for expansion at the Humble refinery will be repaid by the government over a 5-year period. It was estimated in October that some 12 months would be required to get the new plant into operation.

The remarkable, almost spectacular, developments in the American chemical industry are not confined to Texas or to the Gulf Coast, for this expansion is being wrought on a national scale; yet a fair share of these developments are coming to Texas through the sheer force of the outstanding advantages this State inherently possesses.

Writing in *Barron's* of September 16, 1940, Sidney B. Self has summarized major programs of plant expansion based, as he states, "entirely on peace-time needs for products in growing new divisions of chemistry" as follows:

"One of the most important trends is the interest of the chemical industry in the use of petroleum and its gases as a raw material for synthetic organic chemicals, supplementing coal tar. Most of the larger oil companies have for some time been active in the chemical field, as evidenced by facilities already available for making butadiene for synthetic rubber.

"As a result, the Gulf Coast, where supplies of petroleum gases are large, is rapidly becoming one of the most important organic chemical centers in the country, in addition to its already being a center of alkali production. While Dow Chemical's primary object in its new plant is to produce magnesium, lightest metal in the world, from sea water to the tune of 12,000,000 pounds plus annually, a secondary and equally important objective is said to be the production of organic chemicals starting with ethylene gas from petroleum as a base.

"Ethylene is already important as a starting point for a whole range of solvents, including ethyl alcohol, ethylene glycol, used as an anti-freeze, in tetra ethyl lead, and even in plastics, notably ethyl cellulose.

"Since the whole trend of the chemical industry is toward the planned rebuilding and rearrangement of the hydro-carbon molecules found in petroleum as well as in coal tar, it is logical for two of the leaders in this field, Dow and Union Carbide, to plan their future expansion in this area.

"Big molecules, called polymers, are the building blocks used in making all of the new plastics, the new synthetic rubbers, and the two synthetic textile fibers. All of our natural raw materials from wood to silk are composed of large molecules. Now that the chemist has found that he can duplicate molecules of this type, getting products similar and better than natural materials, it might almost be said that the whole chemical industry is engaged in a race to see who can build the biggest molecules.

"While both Dow and Union Carbide are proceeding slowly with their new developments, both are almost certain to be among the largest chemical operations in the country before long in view of the available facilities and the opportunities in this field.

"It has even been said in the chemical industry that, 'In the future when you think of Dow, you will think of Freeport rather than of Midland.' Since Dow's plant at Midland, Mich., is the largest single chemical plant in the country, this is a large order, but it indicates the trend of thought in the industry."

Trend in Oil Refining

So rapid have been the changing demands for premium motor fuels and aviation gasolines and better lubricants and the corresponding technological advances designed to meet these needs, as well as to produce more of the desired products from a given volume of the raw material, crude oil, that a continuous process of new construction, replacement, revamping, and modernization has been the order of the day in the oil refining industry. Along with the great strides made in the technology of oil refining during the past 20 years there has come a corresponding revolutionary change in the concentration of oil refining operations in districts advantageous for meeting the new requirements.

In 1940 along the Gulf Coast of Texas and Louisiana there were 45 oil refineries that refined 30 per cent of the crude oil processed in the United States. In 1920 some 224,000 barrels of crude oil were daily processed in Gulf Coast Refineries; in 1940, this figure had risen to more than a million barrels, an increase of more than 4-fold. The refining capacity is even more, amounting to 1,204,650 barrels per day. The Texas Gulf Coast districts have 30 of these refineries and they alone account for 25 per cent of the total refining capacity of the United States. These Gulf Coast refineries are grouped into the New Orleans-Baton Rouge district, the Beaumont-Port Arthur-Lake Charles area, the Houston Ship Channel-Texas City region, and Corpus Christi. Some 90 per cent of these refineries products move to market by water. Most of this water transport is by ocean tanker but a substantial volume moves up the Mississippi River into the great Middle West market. Huge pipe-line systems move oil far from the interior to these great refinery centers.

The most rapid expansion of refining development in the Gulf Coast country has come during the past 5 or 6 years. Even now Continental Oil Company is completing a new $4,000,000 refinery at Lake Charles. This modern plant is equipped to include crude topping, casinghead—gasoline stabilization, cracking, reforming, alkylation, and thermal polymerization operations. New plants have come in, old ones have been substantially revamped and modernized, a process requiring huge expenditures. It has been estimated that the annual expenditures for such modernization of refinery operations in the Texas Gulf Coast alone have in recent years been averaging between $15,000,000 and $20,000,000 annually.

Continental Oil Company's Wichita Falls refinery has in operation its new $750,000 thermal polymerization unit which produces high octane polymer gasoline. Independent Refining Company is building a catalytic polymerization unit at its Arp refinery. Magnolia Petroleum Company is adding at its Fort Worth refinery a new combination unit and polymerization plant. Danciger Oil and Refining, Inc., is building a catalytic polymerization unit at its Pampa plant. An enlargement program involving an expenditure of several mil-

lions of dollars has been going on at the Borger refinery of Phillips Petroleum Company.

Pure Oil Company announced early in the summer of 1940 plans for the construction of a new polymerization plant at its Smith's Bluff refinery.

Shell Oil Company some time back added a $1,000,000 alkylation plant, at its Deer Park refinery on the Houston Ship Channel, for making aviation gasoline. A $1,500,000 dewaxing plant is being added to the Sinclair refinery at Pasadena, on the Houston Ship Channel.

The Texas Company refinery has recently installed cold sulphuric acid alkylation and small catalytic cracking units for manufacturing high octane aviation gasoline, and also it has recently added facilities for furfural extraction, and solvent dewaxing facilities.

Two Houdry cracking units have been installed in the Magnolia Petroleum Corporation's refinery at Beaumont; also this refinery is operating a cold sulphuric acid alkylation unit.

At its Port Arthur refinery the Gulf Oil Corporation is using the new polyform process, which uniquely combines polymerization and cracking processes, illustrative of the synthetic chemical features in modern petroleum refining. It differs from thermal cracking, using oil admixed with normally gaseous hydrocarbons, mainly propane and butane, at even higher pressures and temperatures. Gulf's newest $1,000,000 isooctane plant at Port Arthur has been in operation for some time; the product of this plant, isooctane, is blended with high quality gasoline to produce aviation gasoline.

A New Steel Industry in the Southwest

The establishment of the first important steel plant in the Southwest was announced from Washington on February 8, 1941, by William S. Knudsen, director general of the Office of Production Management. A new $17,000,000 steel mill will be built by a subsidiary of American Rolling Mill Company on a 592-acre site on the Ship Channel just across from Irish Bend Island, where the Todd Shipyards are to be built. This tract has a one mile frontage on the Ship Channel.

The steel plant is to be built with an RFC loan of $12,000,000, and Armco will use from $3,000,000 to $5,000,000 of its own money. It will use scrap largely as raw material. The plant will be operated by the Sheffield Steel Corporation of Texas. Sheffield Steel, a subsidiary of Armco, is an experienced consumer of scrap in steel manufacture.

The situation as to iron and steel scrap: The importance of scrap in the steel industry may not be generally appreciated. The domestic consumption in the United States of iron and steel scrap, long an important item in the building up of the Japanese steel industry, reached in 1940 the record high of 41,000,000 gross tons. In 1937, the previous record year, United States consumption of scrap amounted to 38,000,000 tons and in that year more than 4,000,000 tons were exported. For comparison it may be noted that peak consumption of scrap in 1917 in World War I amounted to 26,800,000 tons.

Principal foreign markets for scrap are now negligible. On October 15, 1940, exports of scrap to Japan were completely cut off. Italy automatically ceased to be a market factor on entering the War in June. Germany had not been an important buyer of scrap for several years prior to the outbreak of war. England and Canada are not likely to take more than 1,200,000 tons in 1941 provided shipping is available.

Steel mills in the United States use about 45 per cent of scrap and 55 per cent of pig iron in open-hearth furnaces to make new steel for general purposes. Foundries use on the average 70 per cent scrap and 30 per cent pig iron to make castings. Blast furnaces usually add some scrap to accelerate the process of reducing iron ore to pig iron.

By uses, in the United States, 7 per cent of scrap used goes into the making of pig iron, 20 per cent into castings, and 73 per cent into steel.

With the export market being seriously curtailed in 1940 Gulf Coast scrap was moved by barge from Texas ports to the Pittsburgh district and by coastal shipping to eastern Pennsylvania steel mills on the Atlantic Seaboard.

Some 300,000 tons annually of scrap iron are now shipped through the ports of Houston and Texas City; this can be increased to 500,000 tons annually. The annual output of the new Armco plant will be 200,000 ingot tons. It will make billets for shell forgings, structural steel, wire rods, wire products, and light plates used in shipbuilding and various other products of a similar nature required in national defense. In making the initial announcement Mr. Knudsen emphasized that this is to be a permanent industry. The plant will employ between 1,500 and 1,800 people and is expected to be in operation at the end of this year.

Hughes Tool Company of Houston under a contract awarded under the National Defense Act will build an army bomber landing gear plant, costing between $6,000,000 and $12,000,000.

Pulp and Paper Industry

In June, 1940, The Champion Paper and Fibre Company began operating a new $3,500,000 paper manufacturing unit at their Pasadena, near Houston, Texas, plant. This plant is now one of the principal units of the Champion organization and it is also one of the important plants erected in the march of the pulp and paper industry in the South. Champion has long been noted for its progressive attitude, its wide field of researches in paper production from various woods and it has had a leading part in the development of bleached pulps from southern woods. The Houston plant is equipped to make its own bleaching products, manufactured from near-by salt supplies. Their $3,000,000 pulp mill at this place producing 200 tons daily of bleached sulphate from southern woods, has been in operation since 1937. This new paper mill, producing 100 tons daily, is designed to manufacture in addition to machine coated book paper, bond and envelope paper, all made of pulp from near-by southern woods. This mill is furnishing coated book paper on contract to Time, Inc., for use by Life magazine. The total investment of the Champion organization in Texas has been placed at $10,000,000.

In January, 1940, Southland Paper Mills, Inc., began operating near Lufkin, the first newsprint plant in the United States to make use of southern pine as the source of its groundwood. This plant is distinctly an innovation in the world's newsprint industry and as such it has merited the international attention it has received. Its chemical, partially bleached sulphate pulp, used instead of sulphite pulp, is obtained from Champion Paper and Fibre Company at Pasadena. This $6,000,000 plant produces 150 tons of paper daily. Recently the company has let a contract for an addition to the plant, construction and equipment of which will cost approximately $5,000,000.

At Orange, an historic site in the history of the paper industry of the South, and a commercially strategic location in the pulp and paper industry, the Orange Pulp and Paper Mills, Inc., makes wrapping paper and Kraft bags. At the Orange, Texas, plant Mr. Edward H. Mayo in 1911 achieved the distinction so far as is known of being the first to make sulphate pulp out of yellow pine; the success of this innovation in turning out a sound commercial product may be gauged by the subsequent development of the Kraft paper industry in southern United States.

The Timber Wealth of Texas and Comparative Data for the Deep South

The data here summarized were accumulated by the Southern Forest Experiment Station in a survey began in 1932 of Southern forests. I am indebted for these data to Captain I. F. Eldredge, Regional Director, Forest Survey, United States Forest Service. The data cover only that part of the South surveyed by the Southern Forest Experiment Station; the post-oak regions, the alluvial areas of South Texas and of the Edwards Plateau, and the summit areas of the Trans-Pecos mountains are not included in the Texas data.

These data are presented in order to give an overall picture of the forest resources of Texas in comparison with other southern states included in the survey.

Table 1 gives by states the types of forest growth. Table 2 presents by states a break-down of the productive forest area by forest conditions.

Table 1.—Productive Forest Area by Type Groups and States

States	Total Productive Forest Areas	Pine Types[1]	Mixed Pine and Hardwood Types	Hardwood Types	Per Cent Forested
	Thousand Acres				
Texas[2]	10,553	4,725	2,532	3,296	57.0
Oklahoma[2]	2,961	697	686	1,578	73.5
Arkansas[2]	14,820	3,748	2,632	8,440	56.3
Louisiana	16,194	5,371	2,261	8,562	55.7
Mississippi	15,869	6,798	2,632	6,439	53.5
Alabama	18,860	10,047	3,503	5,310	57.6
Georgia[3]	21,036	13,954	2,709	4,373	56.8[5]
Florida[4]	21,653	16,631	294	4,728	62.2[5]
TOTAL	121,946	61,971	17,249	42,726	57.5

[1]Includes longleaf-slash-hardwoods type, 2,900 thousand acres.
[2]Includes only that part of the State in the deep South forest region. South Missouri Delta included with Arkansas.
[3]Excludes Okefenokee Swamp and Coastal Islands, which have an estimated productive forest acreage of 299,000 acres.
[4]Excludes Ocala National Forest and the Everglades, which have an estimated productive forest acreage of 224,000 acres.
[5]These figures include both surveyed and unsurveyed areas.

Table 2.—Distribution of Productive Forest Area by Forest Conditions

States	Total Productive Forest Area	Old Growth	Second Growth Sawlog Size	Second Growth Under Sawlog Size	Reproduction	Clear-cut
	Thousand Acres					
Texas[1]	10,553	1,461	5,601	2,926	343	222
Oklahoma[1]	2,961	447	966	1,462	84	2
Arkansas[1]	14,820	2,441	7,343	4,583	348	105
Louisiana	16,194	3,342	6,712	3,974	608	1,558
Mississippi	15,869	1,884	6,441	5,746	929	869
Alabama	18,860	2,497	7,676	7,337	864	486
Georgia[2]	21,036	2,555	8,812	7,733	1,112	824
Florida[3]	21,653	3,317	3,793	7,621	1,538	5,384
TOTAL	121,946	17,944	47,344	41,382	5,826	9,450

[1]Includes only that part of the State in the deep South forest region. South Missouri Delta included with Arkansas.
[2]Excludes Okefenokee Swamp and Coastal Islands.
[3]Excludes Ocala National Forest and the Everglades.

Table 3 gives the total volume of growing stock, including all sound trees 5.0 inches and larger; the data are expressed in volume of cubic feet (this is quite different from volume in board feet). Table 4 presents the net annual increment (the volume added by growth of the individual trees plus the merchantable volume added by young trees growing into merchantable size during the year, minus the losses occasioned by natural mortality and the effect of turpentining operations, if any). The volume of increment expressed in cubic feet, inside the bark, is given for the year 1936.

Table 3.—Volume of Growing Stock by States*

States	Total	Species-Group: Pine	Species-Group: Hardwood and Cypress (Inside Bark)
	Million Cubic Feet		
Texas[1]	8,572	5,143	3,429
Oklahoma[1]	1,191	625	566
Arkansas[1]	11,566	4,995	6,571
Louisiana	11,790	4,033	7,757
Mississippi	10,380	4,308	6,072
Alabama	11,917	6,938	4,979
Georgia[2]	14,472	9,261	5,211
Florida[3]	7,720	4,435	3,285
TOTAL	77,608	39,738	37,870

[1]Includes only that part of the State in the deep South forest region. South Missouri Delta included with Arkansas.
[2]Excludes Oklefenokee Swamp and Coastal Islands.
[3]Excludes Ocala National Forest and the Everglades.
*Data as of year of survey.

Table 4.—Net Increment in Cubic Feet (Inside Bark), 1936

States	Total	Species-Group: Pine	Species-Group: Hardwood and Cypress (Inside Bark)
	Thousand Cubic Feet		
Texas[1]	461,490	341,160	120,330
Oklahoma[1]	24,900	23,800	1,100
Arkansas[1]	483,890	239,750	244,140
Louisiana	500,690	233,100	267,590
Mississippi	563,050	280,800	282,250
Alabama	560,090	353,130	206,960
Georgia[2]	615,100	421,030	194,070
Florida[3]	160,850	93,580	67,270
TOTAL	3,370,060	1,986,350	1,383,710

[1]Includes only that part of the State in the deep South forest region. South Missouri Delta included with Arkansas.
[2]Excludes Okefenokee Swamp and Coastal Islands.
[3]Excludes Ocala National Forest and the Everglades.

Then, in order to ascertain the drain against the forest-growing stock in these states, the Forest Service canvassed the wood-using industries of the regions covered and approximated closely the volume of timber removed for lumber, cross ties, poles, piles, veneer, cooperage, pulp wood, fuel wood and other uses.

The resulting data for 1936 are presented in Table 5.

TABLE 5.—PRIMARY FOREST INDUSTRIAL PLANTS[1] AND DRAIN ON GROWING STOCK, 1936

State	Number of Plants Including Turpentine Stills	Total	Drain Pine	Hardwood and Cypress (Inside Bark)
		Thousand Cubic Feet		
Texas[2]	639	315,310	238,870	76,440
Oklahoma[2]	85	44,260	31,790	12,470
Arkansas[2]	1,011	418,740	188,990	229,750
Louisiana	646	446,570	250,680	195,890
Mississippi	1,813	555,620	340,040	215,580
Alabama	2,473	515,950	396,740	119,210
Georgia[3]	2,338	396,250	295,540	100,710
Florida[4]	1,080	269,810	183,870	85,940
TOTAL	10,085	2,962,510	1,926,520	1,035,990

[1]Naval stores stills are those active during season 1934–35.
[2]Includes only that part of the State in the deep South forest region. South Missouri Delta included with Arkansas.
[3]Excludes Okefenokee Swamp and Coastal Islands.
[4]Excludes Ocala National Forest and the Everglades.

Captain Eldredge believes that the present forest acreage of the lower South could be made to produce at least twice as much raw material for industrial and domestic purposes than it now does. Further, Eldredge states: "With adequate fire protection and good forest management, the growing stock could, in two or three decades, be doubled nearly everywhere, and in some localities quadrupled," and further he concludes, "It will be no small task to get all of the forest owners of the lower South on a timber-farming basis; but with the laws of Nature and economics both working powerfully to this end, it can be done. . . . The forest resource is not only renewable but its volume and value can be increased greatly. To the extent that this increase is realized the huge timber wealth of the lower South will play its full part in aiding the South to meet its national responsibilities and at the same time enjoy a fuller measure of better living."

NATURAL GAS AN INDUSTRIAL FUEL

At Laredo, Texas boasts of the only antimony smelter on the continent. This plant of the Texas Mining and Smelter Company uses Mexican ores. The process of smelting uses coal for burning out the sulphur and later for reducing the ore. It is then refined in specially designed reverberatory furnaces using natural gas exclusively as the fuel. Used mostly in storage batteries, it is an essential in making type metal; its use in munitions makes it a strategic mineral commodity.

At Marshall, a Darco plant uses East Texas lignite to make an activated carbon product. This plant was established in 1922, the initial expenditure being about a million dollars. In the Panhandle are two zinc smelters and at El Paso is the large custom smelter of American Smelting and Refining Company and the Nichol's copper refinery, all using natural gas as fuel. The El Paso Smelting Works was built about 1883 to treat lead ores from the Santa Eulalia mining district of Chihuahua, Mexico, and from other areas of Chihuahua and Sonora. The smelter was later enlarged and in 1889 was acquired by American Smelting and Refining Company. This plant smelts gold, silver, lead and copper ores.

The Nichol's refinery, which began operations in January, 1930, produces refined electrolytic copper from blister copper provided by Arizona smelters. American Smelting and Refining Company is expanding facilities at its Amarillo plant involving an expenditure of approximately $500,000 and the American Zinc Company of Illinois is expanding capacity at its Dumas plant at a cost of some $350,000. The government owned and operated helium plant at Amarillo is the only one of its kind in existence anywhere. The American Smelting and Refining Company has announced plans for constructing a large electrolytic zinc refining plant in Texas; according to present plans, it will be located somewhere on the Gulf Coast.

A new tin smelter whose probable cost is put between $2,500,000 and $4,000,000, which will treat Bolivian tin ores, is to be located somewhere in the South. The smelter probably will be financed by the Defense Plant Corporation, a sudsidiary of the RFC; ore will be provided through Metals Reserve Company, another RFC subsidiary. The new smelter, it is reported, will be operated on a cost-plus basis by the Dutch firm of N. V. Billiton Mattschapij, owners of tin mines on the island of Billiton in the Dutch East Indies and formerly operators of a tin smelter at Arnheim, Holland. The initial capacity will be 18,000 tons of tin annually (requiring between 40,000 and 50,000 tons of Bolivian ore); this is about 20 per cent of normal United States market requirements.

As this goes to press, an Associated Press dispatch of February 26 announced that the new smelter will go to Texas City and that construction will start at once. Texas City was chosen, the report stated, on account of port advantages, warehouse facilities, the availability of low-cost natural gas fuel and of hydrochloric acid.

The smelter will cost $3,500,000 and will be in operation, it is thought, before the first of next year.

The carbon black industry is an important consumer of natural gas, using in 1939 some 14 per cent of total consumption of natural gas in the United States.

Carbon black production has been trending upward since 1932, although a set-back occurred in 1938. In 1939, Texas had 38 of the 49 carbon black plants of the United States; and Texas in that year had 84 per cent of total capacity of carbon black plants. Most of Texas production is concentrated in the Panhandle but Ward and Winkler counties now have one plant each, and near Corpus Christi a plant of Columbian Carbon Company has been operating since 1939. Another plant is now being built in the Corpus Christi district.

Carbon black owing to its use in the rubber industry is of significance in national defense policy.

Natural gasoline production has become of increasing importance, Texas having produced 704,907,000 gallons

in 1939, an all-time high. Texas took the lead over California in natural gasoline output in 1938.

The leading natural gasoline producing district of the United States is the Texas Panhandle; in 1939 East Texas passed Kettleman Hills, California, thereby attaining second place. The largest gains in Texas, however, were made in the Gulf Coast district, owing to the rapidly expanding recycling operations in that region.

Still another aspect of natural gas is that of recycling in oil production. Though the operations of recycling have been rapidly progressing for the past few years, it is only recently that the extent of these operations is being generally appreciated. According to published reports a $2,000,000 gas-distillate recycling plant is being completed near Falfurrias and Humble Oil and Rezning Company has recently announced a $2,500,000 recycling plant for the Katy field near Houston.

The summary statements of the Bureau of Mines in the 1940 *Minerals Yearbook* are important enough to be quoted here.

"The gross production of natural gas in Texas during 1939 continued the upward trend that has persisted without interruption since 1932. According to records of the Texas Railroad Commission, 1,298 billion cubic feet of gas were produced, an 18-per cent increase over 1938. Of this total, 872 billion were from gas wells and 426 billion from oil wells. The gas output of both types of wells has increased consistently in recent years, as suggested by the fact that casinghead gas equaled 32 per cent of the total gas produced in 1936 and 33 per cent in 1939. Increases in production over 1938 were: Casinghead gas, 7 per cent; sour (high-sulfur), gas, 8 per cent; and sweet gas, 32 per cent.

"Utilization of gas increased in all major classification, but by far the greatest growth was that incident to repressuring and gas-lift operations, which rose from 44.3 billion in 1938 to 155.3 in 1939, or 251 per cent. This was due chiefly to the phenomenal growth in throughput at recycling plants, which process natural gas and vapors at very high pressures and return stripped gas to the natural reservoirs. Data concerning them first were made available for January 1939, when 10 plants extracted liquid condensate from a daily average of 116,444,000 cubic feet of gas. In December, 22 plants reported an average gas volume of 470,442,000 cubic feet processed daily. About 90 per cent of the volume withdrawn from the ground usually is forced back into the producing sand to maintain pressure. Several additional plants are under construction, and others are planned. A large number of high-pressure condensate reservoirs have been discovered and await exploitation in the South Texas, Gulf Coast, and East Texas districts, and new discoveries are being made, hence the rapid expansion of recycling promises to continue for a considerable time.

"A total of 462 billion cubic feet of gas was delivered to gas pipe lines in Texas during 1939—13 per cent more than in 1938. Carbonblack plants burned 317 billion cubic feet (9 per cent over 1938), and plant fuel and lease operations required 171 billion (a 1-per cent increase). Extraction loss of 51 billion cubic feet at gasoline plants also represented a 1-per cent increase, and waste of gas through blowing to the air rose to 142 billion cubic feet—a 4-per cent increase. The reported waste, which includes only tail gas from gasoline plants, is greatest in the South Texas, West Texas, and Gulf Coast districts. The volume of gas processed at gasoline plants was 870 billion cubic feet in 1939 and 821 billion in 1938. The Panhandle district furnished 64 per cent of the 1939 total—525 billion.

"Gas wells completed in Texas numbered 314 in 1939 and 341 in 1938. The most active districts again were Southwest Texas (87) and the Panhandle (81), despite reduced operations. Completion of 62 gas wells on the Gulf Coast in 1939 was a sharp gain over the 36 completed in 1938. Activity in other areas was changed little from 1938, except in West Texas, where only 4 new wells were reported in contrast to 16 in 1938.

"From the standpoint of discoveries of new gas reserves, South Texas overshadowed other districts, with 8 new fields in as many counties and 13 new productive horizons in old fields. Graham No. 1, in Survey 572, Duval County, opened the Chiltipin field in June 1939, producing 10 million cubic feet of gas from the Pettus formation at 4,795 feet. Pettus production was discovered in Karnes County in December by No. 1 Newberry, which made 3 million cubic feet from a depth of 2,949 feet. Gas discoveries were completed in the Catahoula formation in Calhoun, Goliad, and Victoria Counties, the largest (that in Goliad County) having an initial capacity of 15.5 million cubic feet. Other new fields in Bee, Live Oak, and San Patricio Counties produced from the Vicksburg, Hockleyensis, and Frio sands, respectively.

"The West Texas district reported a small discovery of gas by the Hopper No. 1 well in Taylor County. In Limestone County, East Texas district, Barron No. 1 was drilled to the Pettit zone, and at 5,611 feet the well flowed 13.7 million cubic feet of gas daily. A new area was opened in Shackelford County and one new 'pay' horizon in Stephens County, West Central Texas. A new source of gas was developed in Young County, North Texas, from the Strawn formation, and in the Panhandle a new gas area producing from the Permian lime was opened by Freeman No. 1 in Sherman County. The Gulf Coast district reported a discovery in Matagorda County which produced gas from the Miocene at 4,143 feet and a large well completed at 6,520 feet from a new sand—the Yegua—in the Fairbanks field, Harris County, which showed an initial daily flow of 55 million cubic feet."

Airplane Expansion

North American Aviation, Inc., a Pacific Coast airplane producer which specializes in military planes is building a $7,000,000 plant at Henley Field, near Dallas, which will be ready for operation in March, 1941. This plant will employ between 10,000 and 12,000 men.

On January 3, 1941, the War Department announced Fort Worth as the site of a $10,000,000 bomber assembly plant for four-motor bombers from parts largely fabricated by the automobile industry. The huge plant will be operated by the Consolidated Aircraft Corporation of San Diego, California.

A vast expansion is getting under way in the airplane industry. The Fort Worth plant is a phase of the expansion of bomber output. E. S. Duffield in *The Wall Street Journal* of February 19, 1941, writes:

"While this program will be necessary to keep the industry fully employed, launching of the bomber program will mean a net increase in the industry. Subassemblies are to be manufactured by the automobile industry and assembled in four new Government-financed, privately-operated assembly plants at the rate of 2,400 two-engine bombers and 1,200 four-engine bombers a year.

"This annual production, exclusive of plant construction, would cost about $600,000,000. The companies which will operate the plants and their location are as follows: Consolidated Aircraft Corp., Fort Worth, Texas; Douglas Aircraft Co., Tulsa, Okla.; Glenn L. Martin Co., Omaha; and North American Aviation Co., Kansas City.

"Further expansion of the aircraft industry's capacity beyond the point is, thus far, the least definite of all phases of the program. However, both Government and industry spokesmen are unanimous in saying that the industry's expansion beyond any present plans is almost certain. Defense officials concerned with raw material supplies have been warned in very indefinite terms of the prospect for a still greater aircraft industry.

"There is a general acceptance in official circles of still further expansion. Its size is the only indefinite fact."

Shipyards and Shipbuilding

The $2,000,000 plant of Pennsylvania Shipyards, Inc. at Beaumont has been awarded contracts for the construction of two Cl-A diesel-powered cargo vessels for the Maritime Commission, the unit cost of each to be

$1,974,000. A navy yard costing $10,000,000 is being built at Orange, for Consolidated Steel Corporation, holder of a large contract for construction of naval destroyers. A $92,000,000 contract for 12 U.S. Navy destroyers to be built at Orange is reported. And Corpus Christi is the site of a $23,000,000 naval air base now under construction.

It is expected that work will start soon on a $5,000,000 shipyard at Irish Bend island, a few miles below Houston on the Houston ship channel; plans to this effect are reported to have been completed by the United States Maritime Commission and the Houston Shipbuilding corporation. Merchant vessels will be built at this shipyard. Todd Galveston Dry Docks, Inc., has been awarded $2,254,343 for acquisition, construction and installation of additional plant, including floating drydock.

Potentialities in the Processing of Agricultural Raw Materials

Applications (other than those now in operation or to be set up presently) of new developments in processing agricultural raw materials are to be expected.

It is highly desirable that economic analysis of the flour milling industry, meat packing, and dairy products manufacturing in Texas be made in order to show the potentialities of these industries in the State. Texas also has an important sugar refining industry, carried on at Sugar Land, which refines raw sugar.

Expansion in the manufacture of products, including soap from cottonseed oil, is one line in which considerable remains to be done. Procter and Gamble Company's cooking compounds plant at Dallas has been operating since 1921. Several plants in the State are manufacturing margarine. The vegetable oil industry, based on a variety of raw materials, is a major industry and it is of world-wide proportions and importance; Texas can well give far more consideration to further developments to an industry which will continue to be of outstanding importance. The wool scouring plant at San Marcos is being expanded to manufacture yarn and certain textiles. Plans are going ahead for a wool topping plant at New Braunfels, and a new metallic pectinate plant (utilizing grapefruit peel) near McAllen is reported nearing completion.

The canning industry has made considerable progress in Texas during the last few years. The Texas market for cans occasioned the building of two branch plants, by Continental Can and American Can respectively, at Houston, for the manufacture of cans.

Elmer H. Johnson.

Cotton Situation

The outlook for cotton in the United States was never before beset with so many conflicting forces. The most optimistic side of the situation is made up almost entirely of domestic consumption which is running at an all-time high. The total consumption for the first six months of this cotton year ending with January 31 was 4,427,000 bales, and it is being freely predicted that consumption in the United States for this cotton year will reach 9,000,000, which would exceed the previous all-time record of cotton consumption in the United States by more than 1,000,000 bales.

The darkest side of the United States cotton picture is the very low volume of exports and sales to export. Exports to date and indicated sales to export suggest that exports may not even reach a million bales, and in that case the United States will come up to August 1, 1941 with an all-time high carryover.

The unprecedented low export of United States cotton is a result of many factors, such as the above-market price loan offered farmers in the United States, which has priced United States cotton out of line with foreign growths. The price of No. 1 Oomra in Bombay is now only 58 per cent of M. 7/8 inch cotton at United States ports; whereas, normally it is about 79 per cent. In other words, foreign growths are relatively from 1.5 to 2.0 cents per pound cheaper than United States cotton.

In addition to the great price disparity, there are many other forces tending to cut off exports, such as lack of shipping space, lack of dollar exchange to buy cotton, and the effort of Great Britain to prevent cotton from going to Germany, Italy, and Japan by buying both South American crops and Empire crops. Moreover, India, which was one of the big consumers, now has determined to buy only British Empire produced cotton, and mills in India wishing to buy United States cotton must get special government permits to do so. It seems that for the duration of the war United States exports of cotton will be reduced almost to the vanishing point.

Another extremely vital fact to keep in mind in sizing up the cotton situation is the rapid increase in the production of synthetic fiber. During the past six years, world synthetic fiber production has increased about 1,500,000,000 pounds, which is equal to about 3,500,000 bales of cotton. Not all of this is used as a substitute for cotton, but much of it is, especially in countries like Germany, Japan, and Italy.

For the present, then, it seems that cotton growers in the United States must depend almost entirely on the domestic market to take their cotton, and that can scarcely exceed 9,000,000 bales.

Whether the United States can regain foreign markets after the war is over will depend on how much the market will have been reduced by synthetic substitutes and poverty on the one hand, and our ability and willingness to subsidize United States cotton growers to drive foreign producers out of the market on the other.

A. B. Cox.

EMPLOYMENT AND PAY ROLLS IN TEXAS

January, 1941

	Estimated Number of Workers Employed		Percentage Change from		Estimated Amount of Weekly Pay Roll		Percentage Change from	
	December 1940[1]	January 1941[2]	December 1940	January 1941	December 1940[1]	January 1941[2]	December 1940	January 1941
MANUFACTURING								
All Manufacturing Industries	140,535	137,262	− 2.3	+ 5.1	$2,830,046	$2,674,603	− 5.5	+ 3.8
Food Products								
Baking	6,241	6,098	− 2.3	+ 3.1	132,916	130,436	− 1.9	+ 2.9
Carbonated Beverages	2,652	2,684	+ 1.2	+12.2	60,844	62,780	+ 3.2	+17.0
Confectionery	944	813	−13.8	+ 5.7	9,331	8,056	−13.6	−16.2
Flour Milling	1,864	1,818	− 2.5	+15.7	32,438	32,689	+ 0.8	+10.4
Ice Cream	768	766	− 0.3	+ 0.8	15,533	14,978	− 3.6	+ 0.5
Meat Packing	4,855	4,870	+ 0.3	+18.8	105,120	104,802	− 0.3	+19.2
Textiles								
Cotton Textile Mills	6,764	6,932	+ 2.5	+ 5.2	83,946	84,705	+ 0.9	+ 4.7
Men's Work Clothing	3,668	3,224	−12.1	+ 0.3	38,221	32,038	−16.2	+ 6.3
Forest Products								
Furniture	2,050	1,687	−17.7	− 2.3	35,896	24,942	−30.5	+ 2.9
Planing Mills	2,350	2,341	− 0.4	+23.8	49,255	50,119	+ 1.8	+49.8
Saw Mills	16,780	16,289	− 2.9	+ 7.0	204,178	192,671	− 5.6	+ 7.6
Paper Boxes	607	578	− 4.8	+13.5	10,060	9,939	− 1.2	+27.5
Printing and Publishing								
Commercial Printing	2,356	2,309	− 2.0	+ 0.4	53,971	50,568	− 6.3	+ 6.2
Newspaper Publishing	5,089	4,660	− 8.4	− 0.6	134,729	116,688	−13.4	+ 2.3
Chemical Products								
Cotton Oil Mills	4,014	3,817	− 4.9	+15.0	37,957	34,549	− 9.0	+ 3.4
Petroleum Refining	19,959	19,920	− 0.2	− 1.1	646,480	602,402	− 6.8	− 0.3
Stone and Clay Products								
Brick and Tile	2,069	2,130	+ 2.9	+21.8	25,514	25,722	+ 0.8	+41.6
Cement	873	822	− 5.8	− 9.5	26,119	23,802	− 8.9	+ 8.0
Iron and Steel Products								
Foundries and Machine Shops	11,083	10,831	− 2.3	+ 2.1	307,646	296,204	− 3.7	− 7.9
Structural and Ornamental Iron	2,200	2,330	+ 5.9	+26.0	42,675	42,145	− 1.2	+33.9
NONMANUFACTURING								
Crude Petroleum Production	29,598	29,858	+ 0.9	− 2.2	963,636	995,784	+ 3.3	+ 3.4
Quarrying	(3)	(3)	+ 1.0	+ 3.7	(3)	(3)	− 3.8	+14.3
Public Utilities	(3)	(3)	+ 0.4	+ 5.3	(3)	(3)	+ 0.3	+ 9.9
Retail Trade	225,987	173,076	−23.4	+ 8.7	4,028,402	3,131,034	−22.3	+ 6.2
Wholesale Trade	60,789	58,102	− 4.4	+ 0.9	1,930,595	1,766,432	− 8.5	+ 9.9
Dyeing and Cleaning	2,326	2,242	− 3.6	− 4.3	31,536	30,041	− 4.7	− 3.2
Hotels	14,868	15,086	+ 1.5	+ 2.0	175,776	177,356	+ 0.9	+10.4
Power Laundries	10,251	10,565	+ 3.1	+14.2	128,037	135,076	+ 5.5	+18.9

CHANGES IN EMPLOYMENT AND PAY ROLLS IN SELECTED CITIES[5]

	Employment Percentage Change		Pay Rolls Percentage Change	
	Dec., 1940 to Jan., 1941	Jan., 1940 to Jan., 1941	Dec., 1940 to Jan., 1941	Jan., 1940 to Jan., 1941
Abilene	− 8.3	− 5.3	− 6.7	+ 6.9
Amarillo	+ 0.4	+10.3	− 4.7	+19.6
Austin	− 4.3	+ 8.3	− 7.9	+ 4.0
Beaumont	− 1.1	+ 9.7	− 7.9	+13.7
Dallas	− 9.0	+14.4	−11.1	+18.0
El Paso	(4)	+10.9	− 3.7	+18.9
Fort Worth	− 6.9	+11.1	− 9.5	+12.3
Galveston	−15.3	−26.7	−15.1	−14.1
Houston	− 7.7	− 2.6	− 7.3	+ 0.4
Port Arthur	− 0.6	− 4.0	− 7.6	− 0.2
San Antonio	− 9.0	+ 6.5	− 8.0	+ 7.2
Sherman	− 1.8	+ 8.8	+ 1.3	+30.6
Waco	− 2.6	− 3.3	− 2.3	+13.5
Wichita Falls	−11.1	− 7.5	− 3.4	+ 0.8
STATE	− 4.8	+ 3.8	− 6.2	+ 7.5

ESTIMATED NUMBER OF EMPLOYEES IN NONAGRICULTURAL BUSINESS AND GOVERNMENT ESTABLISHMENTS[6]

	1940		1940
January	941,000	July	960,000
February	944,000	August	965,000
March	962,000	September	983,000
April	954,000	October	997,000
May	967,000	November	1,011,000
June	963,000	December (Prelim)	1,033,000

*Does not include proprietors, firm members, officers of corporations, or other principal executives. Factory employment excludes also office, sales, technical, and professional personnel.

(1) Revised.
(2) Subject to revision.
(3) Not available.
(4) No change.
(5) Based on unweighted figures.
(6) Not including self-employed persons, casual workers, or domestic servants, and exclusive of military and maritime personnel. These figures are furnished by the Bureau of Labor Statistics, U.S. Department of Labor.

Prepared from reports from representative Texas establishments to the Bureau of Business Research coöperating with the United States Bureau of Labor Statistics.

COTTON BALANCE SHEET FOR THE UNITED STATES AS OF FEBRUARY 1

(In Thousands of Running Bales Except as Noted)

	Carryover Aug. 1	Imports to Feb. 1*	Government Estimate as of Dec. 1*	Total	Consumption to Feb. 1	Exports to Feb. 1	Total	Balance Feb. 1
1931–1932	6,369	47	16,918	23,334	2,626	4,957	7,583	15,751
1932–1933	9,682	59	12,727	22,468	2,812	5,040	7,852	14,664
1933–1934	8,176	68	13,177	21,421	2,923	4,919	7,842	13,579
1934–1935	7,746	56	9,731	17,533	2,685	2,865	5,550	11,983
1935–1936	7,138	56	10,734	17,928	3,014	4,004	7,018	10,910
1936–1937	5,397	72	12,407	17,876	3,435	3,848	7,283	10,593
1937–1938	4,498	46	18,746	23,290	3,078	3,832	6,910	16,366
1938–1939	11,533	77	12,008	23,618	3,397	2,192	5,589	18,029
1939–1940	13,033	66	11,792	24,891	4,042	4,170	8,212	16,679
1940–1941	10,596	58	12,686	23,340	4,427	654	5,081	18,259

*In 500-pound bales.

The cotton year begins August 1.

POSTAL RECEIPTS

	January 1941	January 1940	December 1940
Amarillo	34,512	32,401	47,412
Austin	72,898	66,252	88,470
Beaumont	29,429	27,637	40,010
Big Spring	6,739	6,386	9,336
Brownsville	6,947	6,536	9,703
Childress	3,070	3,004	5,680
Coleman	2,138	2,395	3,716
Corpus Christi	36,643	28,081	45,742
Corsicana	5,982	5,916	9,431
Dallas	408,351	378,901	498,521
Del Rio	5,762	5,624	5,484
Denison	6,551	6,223	10,291
Denton	8,971	6,264	10,265
El Paso	61,212	46,100	82,244
Fort Worth	154,818	142,478	214,432
Galveston	32,354	30,350	46,140
Harlingen	7,055	6,483	9,862
Houston	271,666	253,482	359,717
Jacksonville	3,687	3,477	3,920
Kenedy	1,747	1,495	1,563
Kilgore	7,028	6,817	8,888
Longview	10,364	10,059	13,774
Lubbock	21,677	20,091	27,624
Lufkin	5,244	5,146	6,577
McAllen	6,438	5,884	8,279
Marshall	6,589	6,452	10,362
Odessa	7,675	7,133	8,535
Palestine	6,651	6,663	7,508
Pampa	6,786	7,580	10,698
Paris	6,706*	†	8,366*
Plainview	4,241	4,931	6,352
Port Arthur	14,603	13,671	25,354
San Angelo	13,312	12,384	18,324
San Antonio	145,688	128,084	203,790
Sherman	8,086	7,802	11,793
Sweetwater	5,558	5,357	6,697
Tyler	17,284	16,047	22,032
Waco	37,981	32,233	44,103
Wichita Falls	26,371	23,561	34,627
TOTAL	1,512,108	1,379,380	1,977,256

*Not included in total.

†Not available.

NOTE: Compiled from reports from Texas chambers of commerce to the Bureau of Business Research.

BUILDING PERMITS

	January 1941	January 1940	December 1940
Amarillo	173,960	132,747	244,114
Austin	392,158	483,268	646,754
Beaumont	307,310	78,700	83,361
Big Spring	12,630	36,320	16,575
Brownsville	14,080*	12,030*	154,612*
Coleman	20,740*†	‡	8,400†
Corpus Christi	1,202,464	1,311,810	247,070
Corsicana	31,550*	10,825	3,331
Dallas	1,048,691	872,378	2,959,276
Del Rio	1,590*	4,075	1,660
Denton	18,375	13,010	5,425
El Paso§	223,032	135,717	134,050
Fort Worth	500,882	283,113	186,681
Galveston	111,030	335,590	40,958
Gladewater	0	5,500	1,060
Harlingen	13,800	20,190	45,760
Houston	2,004,075	3,665,705	3,155,628
Jacksonville	11,400	23,550	1,100
Kenedy	300	0	450
Kilgore	30,700	25,500	25,500
Longview	3,950	8,480	20,150
Lubbock	211,971	595,630	398,776
McAllen	8,004	41,780	8,285
Marshall	63,660	12,483*	25,917
Midland	17,825†	‡	50,325†
New Braunfels	4,155	8,285	130
Palestine	9,026	18,996	40,762
Pampa	31,750	23,975	63,550
Paris	7,475†	‡	6,865†
Plainview	3,800	5,350	3,000
Port Arthur	84,416	65,258	49,852
San Angelo	66,000	44,254	71,134
San Antonio	1,083,086	437,082	199,404
Sherman	8,273	15,434	16,781
Sweetwater	10,985	9,805	1,580
Tyler	46,065	38,459	174,612
Waco	165,085	152,943	80,867
Wichita Falls	58,125	88,630	887,829*
TOTAL	7,956,378	9,016,872	9,995,994

*Does not include public works.

†Not included in total.

‡Not available.

§Building permits for year 1940 were $3,057,179.

NOJE: Compiled from reports from Texas chambers of commerce to the Bureau of Business Research.

JANUARY RETAIL SALES IN INDEPENDENT STORES IN TEXAS

	Number of Firms Reporting	Percentage Change in Dollar Sales Jan., 1941 from Jan., 1940	Jan., 1941 from Dec., 1940
TOTAL TEXAS	1,059	+19.9	−32.2
TEXAS STORES GROUPED BY PRODUCING AREAS:			
District 1–N	60	+ 7.9	−29.2
Amarillo	10	+13.2	−44.2
Canyon	7	+15.7	−21.9
Pampa	8	− 7.6	− 6.3
Plainview	12	+11.4	−26.1
All Others	23	+13.6	− 9.4
District 1–S	23	+ 1.6	−24.9
Lubbock	6	− 2.5	−22.7
All Others	17	+ 9.9	−28.6
District 2	90	+11.3	−29.1
Abilene	13	+36.8	−36.6
Vernon	6	− 1.1	−31.8
Wichita Falls	16	+ 4.7	−36.4
All Others	55	+ 3.2	−15.3
District 3	35	+48.8	−18.5
Breckenridge	5	− 8.7	−41.5
All Others	30	+54.3	−16.6
District 4	248	+22.2	−35.1
Cleburne	8	+18.1	−48.4
Corsicana	7	+23.5	−40.1
Dallas	44	+15.8	−38.8
Denison	7	+54.1	−16.2
Fort Worth	44	+28.0	−35.9
Sherman	6	+25.2	−30.6
Taylor	5	+42.7	−27.0
Temple	8	+ 5.1	−31.8
Waco	29	+20.4	−33.6
All Others	90	+35.8	− 9.4
District 5	112	+21.5	−26.3
Bryan	7	+ 9.4	−35.3
Clarksville	5	−10.0	−15.4
Henderson	6	+34.4	−17.7
Longview	6	+25.0	−20.9
Marshall	7	−10.0	−38.7
Palestine	6	− 0.4	−22.2
Tyler	12	+51.5	−24.4
All Others	63	+17.9	−27.4
District 6	32	+32.6	−32.5
El Paso	19	+35.2	−33.5
All Others	13	+ 2.2	−11.6
District 7	60	+19.2	−26.2
Brady	7	+ 3.0	−43.0
Fredericksburg	11	+28.8	−19.1
San Angelo	13	+23.9	−30.4
All Others	29	+11.5	−17.0
District 8	187	+23.0	−30.8
Austin	21	+49.6	−35.2
Beeville	5	−11.9	− 7.5
Corpus Christi	11	+11.7	−17.3
Lockhart	6	−17.4	−29.2
San Antonio	50	+21.3	−34.3
San Marcos	9	+31.4	− 4.0
All Others	85	+12.1	−15.3
District 9	152	+14.4	−34.4
Bay City	6	+105.6	−22.9
Beaumont	20	+13.4	−49.2
Galveston	16	+18.4	−18.5
Houston	52	+11.9	−36.6
Port Arthur	15	+19.4	−33.7
Victoria	6	+16.4	−23.1
All Others	37	+ 7.6	− 3.9
District 10	60	+ 3.5	−22.9
Brownsville	9	+ 2.3	−36.5
Harlingen	6	−10.3	−11.7
Laredo	5	+25.7	−30.0
All Others	40	− 2.3	−13.5

NOTE: Prepared from reports of independent retail stores to the Bureau of Business Research coöperating with the U.S. Bureau of the Census.

PURCHASES OF SAVINGS BONDS

	Jan., 1941	Jan., 1940
Amarillo	56,325	80,700
Austin	134,400	113,119
Beaumont	60,068	134,663
Big Spring	18,694	28,425
Corpus Christi	34,313*	†
Dallas	541,519	562,594
Denison	9,394	35,569
Denton	12,881	11,794
El Paso	94,256	214,369
Fort Worth	198,938	56,865
Galveston	102,113	84,675
Gladewater	33,431	51,413
Harlingen	4,819	12,900
Kenedy	1,200	7,500
Kilgore	21,675	7,256
Longview	68,306	53,025
McAllen	7,219	11,531
Marshall	36,918	44,831
Odessa	788	18,881
Palestine	4,838	27,319
Pampa	3,469	7,913
Paris	17,325*	†
Plainview	5,868	19,031
Port Arthur	21,038	59,531
San Angelo	37,481	46,050
San Antonio	295,350	469,275
Sherman	11,775	24,000
Tyler	111,038	129,225
Waco	93,150	121,500
Wichita Falls	105,600	121,838
TOTAL	2,092,551	2,555,792

*Not included in total.
†Not available.
NOTE: Prepared from reports from Texas chambers of commerce to the Bureau of Business Research.

LUMBER

(In Broad Feet)

	Jan., 1941	Jan., 1940	Dec., 1940
Southern Pine Mills:			
Average Weekly Production per unit	325,918	243,272	304,935
Average Weekly Shipments per unit	340,522	221,914	319,236
Average Unfilled Orders per unit, end of month	1,041,316	693,178	965,299

NOTE: From Southern Pine Association.

PERCENTAGE CHANGES IN CONSUMPTION OF ELECTRIC POWER

	Jan., 1941 from Jan., 1940	Jan., 1941 from Dec., 1941
Commercial	+15.8	+ 6.1
Industrial	+12.9	+ 1.7
Residential	+ 5.5	+ 5.1
All Other	+ 3.1	+ 1.6
TOTAL	+10.9	+ 3.3

Prepared from reports from 15 electric power companies to the Bureau of Business Research.

JANUARY RETAIL SALES OF INDEPENDENT STORES IN TEXAS

	Number of Firms Reporting	Percentage Change in Dollar Sales Jan., 1941 from Jan., 1940	Jan., 1941 from Dec., 1940
TEXAS	1,059	+19.9	−32.2
STORES GROUPED BY LINE OF GOODS CARRIED:			
APPAREL	121	+ 9.8	−41.5
Family Clothing Stores	27	+ 4.9	−54.5
Men's and Boys' Clothing Stores	43	+ 9.1	−43.3
Shoe Stores	20	+21.0	−45.5
Women's Specialty Shops	31	+10.2	−36.4
AUTOMOTIVE*	71	+32.2	− 1.0
Motor Vehicle Dealers	68	+32.3	+ 1.3
COUNTRY GENERAL	112	+16.1	−17.5
DEPARTMENT STORES	55	+13.6	−51.9
DRUG STORES	123	+12.6	−20.1
DRY GOODS AND GENERAL MERCHANDISE	20	−12.2	−59.9
FILLING STATIONS	43	+ 5.3	− 5.2
FLORISTS	23	+ 3.5	−40.5
FOOD*	167	− 0.5	− 6.0
Grocery Stores	47	− 3.3	−11.1
Grocery and Meat Stores	115	+ 0.1	− 4.5
FURNITURE AND HOUSEHOLD*	56	+15.2	−42.3
Furniture Stores	45	+15.5	−42.0
Household Appliance Dealers	6	+ 5.8	−42.9
JEWELRY	30	+30.2	−69.9
LUMBER, BUILDING, AND HARDWARE*	197	+55.9	+16.4
Farm Implement Dealers	10	+33.4	+20.2
Hardware Stores	61	+25.8	+ 0.7
Lumber and Building Material Dealers	123	+72.2	+24.1
RESTAURANTS	25	+ 0.5	− 0.9
ALL OTHER STORES	16	+15.0	− 4.3
TEXAS STORES GROUPED ACCORDING TO POPULATION OF CITY:			
All Stores in Cities of—			
Over 100,000 population	190	+18.4	−36.7
50,000–100,000 population	126	+28.1	−34.9
2,500–50,000 population	468	+19.1	−26.2
Less than 2,500 population	275	+12.1	− 6.0

*Group total includes kinds of business other than the classifications listed.
NOTE: Prepared from reports of independent retail stores to the Bureau of Business Research coöperating with the United States Bureau of the Census.

COMMODITY PRICES

	Jan. 1941	Jan. 1940	Dec. 1940
Wholesale Prices:			
U.S. Bureau of Labor Statistics (1926=100)		79.4	80.0
Farm Prices:			
U.S. Department of Agriculture (1910–1914=100)	104.0*	99.0	101.0
U.S. Bureau of Labor Statistics (1926=100)		69.1	69.7
Retail Prices			
Food (U.S. Bureau of Labor Statistics 1935–39=100)	97.8*	94.8	97.3†
Department Stores (Fairchilds Publications, Jan. 1931=100)	94.2	92.3	93.9

*Preliminary.
†Revised.

INVENTORIES OF INDEPENDENT RETAIL STORES IN TEXAS

	Number of Firms Reporting	Percentage Change Inventories Sales Dec. 31, 1940 from Dec. 31, 1939	Year 1940 from Year 1939
TEXAS	766	+ 4.4	+ 5.7
STORES GROUPED BY LINE OF GOODS CARRIED:			
APPAREL	75	+ 3.7	+ 4.7
Family Clothing Stores	15	− 0.7	+ 4.8
Men's and Boys' Clothing Stores	22	− 0.6	+ 3.1
Shoe Stores	18	− 0.8	+ 4.9
Women's Specialty Shops	20	+10.1	+ 5.5
AUTOMOTIVE*	69	+10.0	+12.9
Motor Vehicle Dealers	66	+ 9.6	+12.6
COUNTRY GENERAL	91	+ 0.3	+ 4.2
DEPARTMENT STORES	33	+ 0.7	+ 6.9
DRUG STORES	70	+ 2.3	+ 2.6
DRY GOODS AND GENERAL MERCHANDISE	11	− 5.1	+ 1.4
FILLING STATIONS	28	+ 3.7	− 0.3
FLORISTS	11	+ 5.4	+ 1.8
FOOD*	142	+ 1.4	− 0.5
Grocery Stores	44	+ 3.7	+ 0.9
Grocery and Meat Stores	95	+ 0.5	− 1.0
FURNITURE AND HOUSEHOLD*	38	+ 0.5	+ 2.4
Furniture Stores	32	+ 0.05	+ 3.3
JEWELRY	21	+10.8	+ 7.9
LUMBER, BUILDING AND HARDWARE*	152	+11.1	+ 3.6
Farm Implement Dealers	9	+ 5.8	+18.9
Hardware Stores	43	+ 4.2	+ 6.9
Lumber and Building Material Dealers	96	+13.3	+ 2.9
RESTAURANTS	15	− 2.2	− 0.5
ALL OTHER STORES	10	+14.8	+ 2.0

*Group total includes kinds of Business other than the classifications listed.
NOTE: Prepared from reports of independent retail stores to the Bureau of Business Research coöperating with the United States Bureau of the Census. The percentage changes shown for the year are not identical with the ones shown in the sales table because of differences in the sample.

CEMENT

(In Thousands of Barrels)

	Jan., 1941	Jan., 1940	Dec., 1940
Texas Plants			
Production	654	445	602
Shipments	7,986	3,889	8,192
Stocks	764	906	892
United States			
Production	9,025	6,205	11,147
Shipments	7,986	3,889	8,192
Stocks	24,420	25,765	23,305
Capacity Operated	42.4%	28.5%	50.9%

NOTE: From U.S. Department of Interior, Bureau of Mines.

TEXAS COMMERCIAL FAILURES

	Jan., 1941	Jan., 1940	Dec., 1940
Number	35	26	19
Liabilities*	$305	$262	$179
Assets*	135	128	128
Average Liabilities per Failure*	8	10	9

*In thousands.
NOTE: From Dun and Bradstreet, Inc.

JANUARY CREDIT RATIOS IN TEXAS RETAIL STORES

(Expressed in Per Cent)

	Number of Stores Reporting	Ratio of Credit Sales to Net Sales		Ratio of Collections to Outstandings		Ratio of Credit Salaries to Credit Sales	
		1941	1940	1941	1940	1941	1940
All Stores	70	66.0	67.2	41.6	40.4	1.3	1.3
Stores Grouped by Cities:							
Abilene	4	57.9	59.8	35.4	34.4	2.1	2.5
Austin	6	60.5	62.4	48.1	46.7	1.6	1.5
Beaumont	3	70.2	73.8	41.5	44.6	1.6	1.6
Bryan	3	60.6	61.7	34.6	33.0	4.8	5.0
Dallas	9	72.4	73.4	41.7	39.3	0.9	0.9
El Paso	3	53.4	57.5	35.8	40.5	1.3	1.4
Fort Worth	6	69.2	66.3	40.5	36.4	1.3	1.5
Houston	8	66.5	66.7	42.5	41.7	1.9	1.5
San Antonio	5	58.2	62.8	48.4	48.6	1.4	1.3
Waco	5	65.4	66.8	32.1	32.1	1.5	1.7
All Others	18	59.7	61.4	43.0	41.1	1.9	1.9
Stores Grouped According to Type of Store:							
Department Stores (Annual Volume Over $500,000)	20	65.4	66.6	43.4	42.5	1.4	1.3
Department Stores (Annual Volume under $500,000)	13	59.9	61.4	37.2	35.3	2.3	2.4
Dry-Goods-Apparel Stores	5	61.1	64.9	36.7	36.9	2.4	2.4
Women's Specialty Shops	16	67.6	68.6	37.7	35.6	0.7	0.8
Men's Clothing Stores	16	69.1	70.6	39.5	39.0	1.3	1.5
Stores Grouped According to Volume of Net Sales During 1940:							
Over $2,500,000	9	70.3	74.2	42.5	42.4	1.3	1.2
$2,500,000 down to $1,000,000	11	60.5	63.3	40.6	41.8	1.4	1.4
$1,000,000 down to $500,000	10	59.5	60.4	42.1	42.5	1.4	1.4
$500,000 down to $100,000	29	61.4	63.3	39.1	37.7	1.9	2.0
Less than $100,000	11	57.4	61.6	39.2	39.1	4.3	4.0

NOTE: The ratios shown for each year, in the order in which they appear from left to right are obtained by the following computations: (1) Credit Sales divided by Net Sales. (2) Collections during the month divided by the total accounts unpaid on the first of the month. (3) Salaries of the credit department divided by credit sales. The data are reported to the Bureau of Business Research by Texas retail stores.

PETROLEUM

Daily Average Production

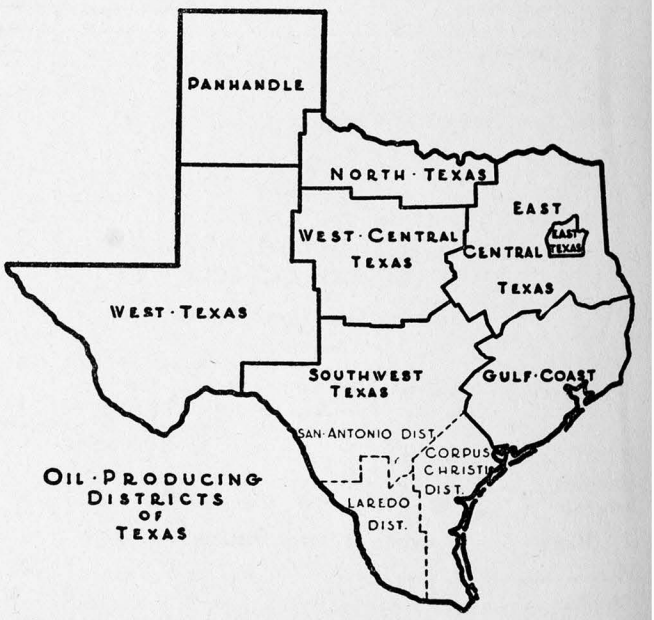
(In Barrels)

	Jan., 1941	Jan., 1940	Dec., 1940
Coastal Texas*	234,030	226,610	237,000
East Central Texas	80,240	79,140	81,550
East Texas	346,070	394,490	356,600
North Texas	98,050	80,980	106,050
Panhandle	72,380	80,100	77,950
Southwest Texas	184,100	206,760	189,900
West Central Texas	30,020	31,770	30,950
West Texas	206,230	232,930	209,050
STATE	1,251,120	1,332,780	1,289,050
UNITED STATES	3,506,560	3,584,900	3,549,550
Imports	223,114	156,914	270,536

*Includes Conroe.

NOTE: From American Petroleum Institute. See accompanying map showing the oil producing districts of Texas.

Gasoline sales as indicated by taxes collected by the State Comptroller were: December, 1940, 116,430,000 gallons; Dec., 1939, 111,336,000 gallons; November, 1940, 113,448,000 gallons.



SHIPMENTS OF LIVE STOCK CONVERTED TO A RAIL-CAR BASIS*

	Cattle		Calves		Hogs		Sheep		Total	
	1941	1940	1941	1940	1941	1940	1941	1940	1941	1940
Total Interstate Plus Fort Worth¶	2,611	2,762	930	847	995	669	364	410	4,900	4,688
Total Intrastate Omitting Fort Worth	211	341	152	71	17	22	13	21	393	455
TOTAL SHIPMENTS	2,822	3,103	1,082	918	1,012	691	377	431	5,293	5,143

*Rail-car Basis: Cattle, 30 head per car; calves, 60; hogs, 80; and sheep, 250.

Fort Worth shipments are combined with interstate forwardings in order that the bulk of market disappearance for the month may be shown.

NOTE: These data are furnished the Agricultural Marketing Service, U.S.D.A. by railway officials through more than 1,500 station agents, representing every live stock shipping point in the State. The data are compiled by the Bureau of Business Research.

BANKING STATISTICS

(In Millions of Dollars)

	January, 1941		January, 1940		December, 1940	
	Dallas District	United States	Dallas District	United States	Dallas District	United States
DEBITS to individual accounts	$ 984	$37,846	$ 832	$33,555	$ 1,250*	$51,424*
Condition of reporting member banks on—	January 29, 1941		January 31, 1940		December 31, 1940	
ASSETS:						
Loans and investments—total	580	25,676	540	23,174	581	25,527
Loans—total	319	9,308	277	8,499	318	9,390
Commercial, industrial, and agricultural loans	219	5,076	184	4,295	219	5,018
Open market paper	2	314	2	321	1	301
Loans to brokers and dealers in securities	4	458	3	614	5	584
Other loans for purchasing or carrying securities	13	459	14	485	14	465
Real estate loans	23	1,229	22	1,183	23	1,230
Loans to banks	---	35	---	54	---	37
Other loans	58	1,737	52	1,547	56	1,755
Treasury Bills	28	685	16	648	27	611
Treasury Notes	37	2,214	44	1,747	38	2,129
U.S. Bonds	97	7,051	93	6,482	99	6,979
Obligations fully guaranteed by U.S. Gov't	39	2,744	53	2,414	40	2,743
Other securities	60	3,674	57	3,384	59	3,675
Reserve with Federal Reserve Bank	155	12,111	136	10,258	150	11,797
Cash in vault	13	527	11	458	12	535
Balances with domestic banks	281	3,352	277	3,067	282	3,462
Other assets—net	31	1,232	29	1,247	30	1,211
LIABILITIES:						
Demand deposits—adjusted	536	22,932	471	19,199	508	22,299
Time deposits	136	5,425	136	5,257	136	5,432
U.S. Government deposits	14	237	31	573	30	474
Inter-bank deposits:						
Domestic banks	280	9,076	265	8,029	287	9,065
Foreign banks	1	650	1	738	1	692
Borrowings	---	1	---	1	---	---
Other liabilities	4	754	3	690	4	748
Capital account	89	3,823	86	3,717	89	3,822

*Five Weeks.

NOTE: From Federal Reserve Board.

JANUARY, 1941, CARLOAD MOVEMENT OF POULTRY AND EGGS

Shipments from Texas Stations

Destination*	Cars of Poultry: Live Chickens		Live Turkeys		Dressed Chickens		Dressed Turkeys		Cars of Eggs†	
	Jan. 1941	Jan. 1940	Jan. 1941	Jan. 1940	Jan. 1941	Jan. 1940	Jan. 1941	Jan. 1940	Jan. 1941	Jan. 1940
TOTAL	2	2	2	3	54	29	11	12	83	35
Intrastate	0	0	0	0	0	0	0	2	0	4
Interstate	2	2	2	3	54	29	11	10	83	31

Origin Receipts at Texas Stations

TOTAL	---	---	---	---	---	1	---	---	7	20
Intrastate	---	---	---	---	---	0	---	---	0	4
Interstate	---	---	---	---	---	1	---	---	7	16

*The destination above is the first destination as shown by the original waybill. Changes in destination brought about by diversion orders are not shown.

†Powdered eggs and canned frozen eggs are converted to a shell egg equivalent.

NOTE: These data are furnished to the Agricultural Marketing Service, U.S.D.A. by railroad officials through agents at all stations which originate and receive carload shipments of poultry and eggs. The data are compiled by the Bureau of Business Research.

TEXAS CHARTERS

	January 1941	January 1940	December 1940
Domestic Corporations			
Capitalization*	$ 958	$2,055	$1,392
Number	80	143	80
Classification of new corporations:			
Banking-Finance	6	4	4
Manufacturing	13	26	16
Merchandising	20	35	15
Oil	11	23	7
Public Service	0	2	3
Real Estate-Building	7	9	9
Transportation	4	9	8
All Others	19	35	18
Number capitalized at less than $5,000	42	62	27
Number capitalized at $100,00 or more	2	3	2
Foreign Corporations (Number)	21	27	35

*In thousands.

NOTE: Compiled from records of the Secretary of State.

Announcing

DIRECTORY OF TEXAS MANUFACTURERS
1940 Edition

Listing the manufacturing establishments by cities and by products, the 1940 Directory includes the name of the principal officer or officers, date of establishment of the firm, information regarding the extent of distribution of the products manufactured, trade names used, location of the home office, and a complete list of the products manufactured by each plant. More than 9,000 manufacturing plants of all types are now located in Texas, and as much information as it has been possible to obtain for each firm has been included.

Although the Directory for 1940 has been greatly enlarged and improved, the same price has been maintained—$2.00 per copy, postpaid. Please address orders and requests to:

BUREAU OF BUSINESS RESEARCH, THE UNIVERSITY OF TEXAS, AUSTIN, TEXAS

CONTENTS

PAGE

Business Review and Prospect, F. A. Buechel 3
Cotton Situation, A. B. Cox 13
Texas Industry in Perspective, Elmer H. Johnson 4

LIST OF CHARTS

Comparative Indexes of Factory Pay Rolls in Texas and the United States 1
Indexes of Business Activity in Texas 2

LIST OF TABLES

Banking Statistics 19
Building Permits 15
Carload Movement of Poultry and Eggs 19
Cement 17
Charters 19
Commercial Failures 17
Commodity Prices 17
Cotton Balance Sheet 15
Credit Ratios in Texas Retail Stores 18
Employment and Pay Rolls in Texas 14
Lumber 16
Percentage Changes in Consumption of Electric Power 16
Petroleum 18
Postal Receipts 15
Purchases of Savings Bonds 16
Retail Sales of Independent Stores in Texas 16, 17
Inventories of Independent Retail Stores in Texas 17
Shipments of Livestock 18