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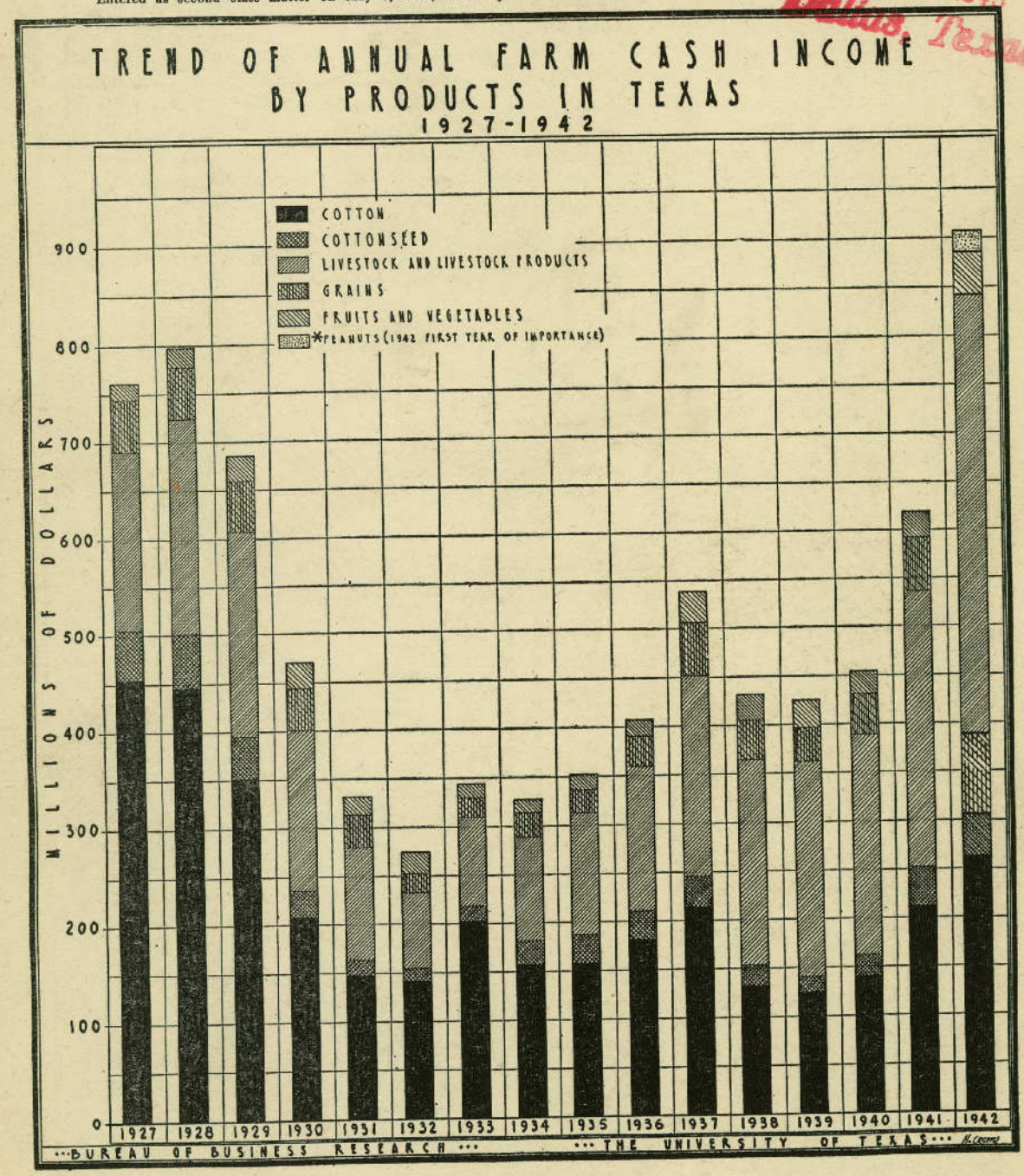

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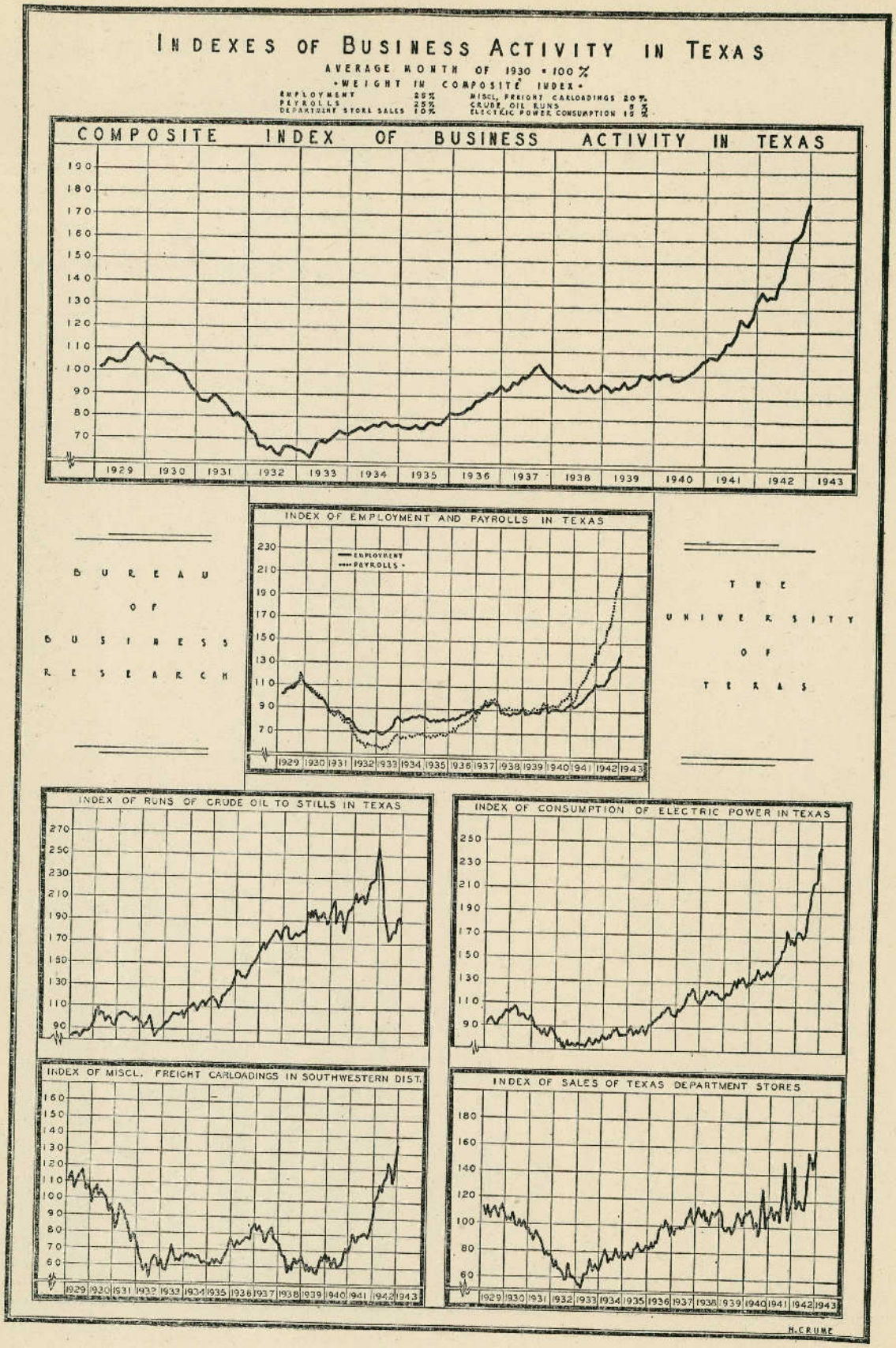

INDEXES OF BUSINESS ACTIVITY IN TEXAS
AVERAGE MONTH OF 1930 = 100 %
WEIGHT IN COMPOSITE INDEX
EMPLOYMENT 25%
PAYROLLS 25%
DEPARTMENT STORE SALES 10%
MISCL. FREIGHT CARLOADINGS 20%
CRUDE OIL RUNS 7 1/2
ELECTRIC POWER CONSUMPTION 12 1/2
COMPOSITE INDEX OF BUSINESS ACTIVITY IN TEXAS
INDEX OF EMPLOYMENT AND PAYROLLS IN TEXAS
EMPLOYMENT
PAYROLLS
BUREAU OF BUSINESS RESEARCH
THE UNIVERSITY OF TEXAS
INDEX OF RUNS OF CRUDE OIL TO STILLS IN TEXAS
INDEX OF CONSUMPTION OF ELECTRIC POWER IN TEXAS
INDEX OF MISCL. FREIGHT CARLOADINGS IN SOUTHWESTERN DIST.
INDEX OF SALES OF TEXAS DEPARTMENT STORES
1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941 1942 1943
H.C.RUME

Business Review and Prospect

The year 1942 will stand out in American history for its unprecedented achievements and for having established a basis for even greater accomplishments in 1943. The industries and farms of the nation have produced much more than in any previous year. The railroads have carried more freight, and the utilities have supplied more power. Industrial production reached an all-time peak with a constantly increasing percentage of factory output in the form of war products. At the close of the year more than one-half of the factory production was probably for war. Also during the year, the armed forces have been expanded to an estimated seven million with more than a million men overseas. The war production of this country alone now equals that of all of the Axis countries combined, and our civilian production far exceeds theirs.

The momentum achieved as the year advanced makes certain still greater results in 1943 than in the year just ended. Measures and policies developed during 1942 have established the broad pattern of business and daily life which will dominate the present year. This pattern may be expected rapidly to take specific form. The supreme objective will be to devote to the war effort all of the nation's capacity and resources, which can be so devoted, consistent with the health and efficiency of the people.

Economic Activity in Texas

More than any other State south of the Mason and Dixon line Texas feels the full impact of war activities in all its aspects. It ranks first among southern states and seventh among the states of the union in war contracts and allocations, and probably ranks even higher in the number and magnitude of its military establishments. The underlying causes for the tremendous surge of economic activity in the State are outlined in the article in this issue of the Review by Elmer H. Johnson. The quantitative results of these activities are shown graphically on the inner cover page of the Review and in the following table:

DECEMBER INDEXES OF BUSINESS ACTIVITY IN TEXAS

(Average month of 1930=100%)

	Dec., 1942	Dec., 1941	Nov., 1942
Employment	140.4	115.0	134.0
Payrolls	210.2	143.0	209.8
Miscellaneous Freight Carloadings (Southwest District)	135.2	99.6	124.7
Runs of Crude Oil to Stills	189.3	238.1	193.7*
Department Store Sales	148.8	120.5	148.3
Electric Power Consumption	246.2	173.2	242.3
Composite	177.1	134.0	171.7

*Revised.

Industry and trade in Texas reached unrperecented heights during 1942 and the sharp upward trend at the close of the year clearly forecasts further advances. Not so many years ago a prediction that payrolls in Texas might within a comparatively short time surpass those of 1929 would have seemed incredible; yet, non-agricultural payrolls in this State during 1942 were nearly 60 per cent greater than in 1929. In this connection it is worthy of note that the commodity price level in 1929 and in 1942 was nearly the same. Hence the quantity of goods which could be purchased by the wage earners of the state was approximately half again as great in 1942 as it was in 1929. During 1942 the index of non-agricultural payrolls of the state increased by nearly 50 per cent, and since the increase in costs of living was less than 20 per cent during that period, the plane of living probably has never before been as high as it is at present in this state. This situation will from now on be adversely affected by a number of factors which have now become effective. Among these are the Victory Tax, a much higher level of income taxes, and a gradually increasing price level. Moreover, still higher taxes possibly including a sales tax, are in prospect, and an enactment requiring the systematic purchase of government bonds is probable within the near future.

Farm Cash Income

The extraordinary increase in Texas non-agricultural payrolls noted above was matched by an equally impressive rise in farm cash income. The farm cash income in this state during 1942 as computed by this Bureau was 908 million dollars; in 1941, the corresponding figure was 616 million dollars. Thus, the increase in 1942 was nearly 50 per cent over 1941. The latter year itself represented a substantial gain over several immediately proceding years.

INDEXES OF AGRICULTURAL CASH INCOME

(Average month 1928–1932=100%)

District	Dec., 1942	Nov., 1942	Dec., 1941	Cumulative Income Year, 1942 (000 omitted)	Cumulative Income Year, 1941 (000 omitted)
1–N	200.0	180.8	194.4	85,592	44,275
1–S	284.8	301.5	572.9	92,444	68,747
2	155.3	183.0	376.0	119,460	101,819
3	273.1	247.6	134.9	50,943	29,004
4	189.6	136.5	182.9	157,809	112,675
5	261.0	134.9	120.3	59,397	35,195
6	417.0	293.4	210.2	48,428	34,460
7	174.3	208.8	105.3	69,920	53,289
8	220.6	204.6	132.5	85,161	53,150
9	244.5	384.6	340.5	64,676	42,711
10	520.6	430.7	112.3	24,249	14,332
10–A	271.3	517.0	187.6	49,374	26,580
STATE	237.0	220.8	251.3	907,453	616,237

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.

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

FARM CASH INCOME IN TEXAS BY CROP REPORTING DISTRICTS AND BY SOURCES

1941

	Cotton			Cottonseed			Grains		Livestock and Livestock Products				All Other Products			TOTAL		
	Per-cent of State Total	($000)	Per cent of Dist. Total	Per cent of State Total	($000)	Per cent of Dist. Total	Per-cent of State Total	($000)	Per cent of Dist. Total	Per cent of State Total	($000)	Per cent of Dist. Total	Per-cent of State Total	($000)	Per cent of Dist. Total	Per cent of State Total	($000)	Per cent of Dist. Total
1-N	1.79	3,758	8.49	1.69	688	1.55	28.42	15,413	34.81	8.55	24,416	55.15	———	———	———	7.18	44,275	100.00
1-S	18.58	38,957	56.67	17.03	6,934	10.09	7.54	4,093	5.95	6.57	18,763	27.29	———	———	———	11.16	68,747	100.00
2	27.71	58,109	57.07	27.24	11,089	10.89	9.08	4,925	4.84	9.70	27,696	27.20	———	———	———	16.52	101,819	100.00
3	1.61	3,381	11.66	1.60	652	2.25	3.44	1,866	6.43	8.09	23,105	79.66	———	———	———	4.71	29,004	100.00
4	22.19	46,525	41.29	23.74	9,663	8.58	11.78	6,391	5.67	17.10	48,834	43.34	4.85	1,262	1.12	18.28	112,675	100.00
5	8.20	17,185	48.83	8.17	3,326	9.45	2.76	1,497	4.25	3.72	10,616	30.16	9.87	2,571	7.31	5.71	35,195	100.00
6	2.95	6,187	17.95	2.90	1,181	3.43	———	———	———	9.49	27,092	78.62	———	———	———	5.59	34,460	100.00
7	2.21	4,627	8.68	2.28	930	1.75	1.39	756	1.42	16.45	46,976	88.15	———	———	———	8.65	53,289	100.00
8	9.60	20,132	37.88	10.13	4,122	7.76	2.64	1,433	2.70	9.43	26,939	50.68	2.01	524	0.98	8.63	53,150	100.00
9	2.43	5,105	11.95	2.53	1,026	2.40	31.81	17,256	40.41	6.43	18,349	42.96	3.74	975	2.28	6.93	42,711	100.00
10	0.66	1,375	9.59	0.65	265	1.85	1.14	621	4.33	3.37	9,610	67.05	9.45	2,461	17.18	2.33	14,332	100.00
10-A	2.07	4,333	16.30	2.04	830	3.12	———	———	———	1.10	3,164	11.90	70.08	18,253	68.68	4.31	26,580	100.00
STATE	100.00	209,674	34.02	100.00	40,706	6.61	100.00	54,251	8.80	100.00	285,560	46.34	100.00	26,046	4.23	100.00	616,237	100.00

1942

	Cotton			Cottonseed			Grains		Livestock and Livestock Products				All Other Products			TOTAL		
	Per-cent of State Total	($000)	Per cent of Dist. Total	Per cent of State Total	($000)	Per cent of Dist. Total	Per-cent of State Total	($000)	Per cent of Dist. Total	Per cent of State Total	($000)	Per cent of Dist. Total	Per-cent of State Total	($000)	Per cent of Dist. Total	Per cent of State Total	($000)	Per cent of Dist. Total
1-N	1.80	4,730	5.53	1.89	801	.94	42.51	35,423	41.38	9.90	44,638	52.15	———	———	———	9.43	85,592	100.00
1-S	18.65	49,081	53.09	19.37	8,209	8.88	6.14	5,121	5.54	6.47	29,204	31.59	1.23	829	.90	10.19	92,444	100.00
2	22.26	58,585	49.04	23.28	9,868	8.26	8.59	7,155	5.99	9.45	42,637	35.69	1.80	1,215	1.02	13.16	119,460	100.00
3	1.87	4,924	9.67	1.94	821	1.61	1.69	1,411	2.77	8.28	37,366	73.35	9.52	6,421	12.60	5.61	50,943	100.00
4	22.61	59,497	37.70	22.61	9,582	6.07	8.49	7,077	4.49	17.59	79,329	50.27	3.44	2,324	1.47	17.39	157,809	100.00
5	9.40	24,730	41.63	9.28	3,932	6.62	2.31	1,923	3.24	3.90	17,594	29.62	16.62	11,218	18.89	6.55	59,397	100.00
6	3.96	10,429	21.54	2.94	1,245	2.57	———	———	———	8.15	36,754	75.89	———	———	———	5.34	48,428	100.00
7	1.62	4,265	6.10	1.60	678	.97	1.19	992	1.42	14.04	63,351	90.60	.94	634	.91	7.71	69,920	100.00
8	10.76	28,310	33.24	10.41	4,411	5.18	2.24	1,865	2.19	10.55	47,591	55.88	4.42	2,984	3.51	9.38	85,161	100.00
9	3.19	8,398	12.98	2.85	1,208	1.87	25.93	21,609	33.41	6.93	31,257	48.33	3.27	2,204	3.41	7.13	64,676	100.00
10	.63	1,656	6.83	.64	271	1.12	.91	762	3.14	3.66	16,509	68.08	7.49	5,051	20.83	2.67	24,249	100.00
10-A	3.25	8,554	17.33	3.19	1,353	2.74	———	———	———	1.08	4,870	9.86	51.27	34,597	70.07	5.44	49,374	100.00
STATE	100.00	263,159	29.00	100.00	42,379	4.67	100.00	83,338	9.18	100.00	451,100	49.71	100.00	67,477	7.44	100.00	907,453	100.00

TREND OF ANNUAL FARM CASH INCOME IN TEXAS BY PRODUCTS, 1927–1942

(Thousands of Dollars)

STATE TOTAL

	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942
Cotton	454,117	447,350	352,032	208,473	147,525	140,925	200,744	156,231	156,745	180,744	214,251	132,385	123,647	140,731	209,674	263,159
Cottonseed	50,843	55,019	42,533	28,264	15,585	13,214	17,050	24,800	29,478	30,204	31,990	21,811	17,859	21,919	40,706	42,379
Grains‡	56,941	53,112	53,082	42,540	33,255	19,451	19,839	27,148	23,556	30,024	55,561	41,103	34,837	42,628	54,251	83,338
Livestock*	140,047	170,097	160,444	118,645	76,732	51,559	49,682	66,863	78,820	87,438	138,536	132,714	142,227	130,724	152,710	260,331
Livestock Products†	42,167	49,900	49,882	46,429	38,735	26,798	43,203	40,504	48,455	60,572	66,257	77,638	78,312	93,359	132,850	190,769
Fruits and Vegetables¶	16,683	22,070	26,037	26,962	18,714	21,865	12,867	13,181	13,947	18,145	31,198	26,646	27,162	23,101	26,046	44,508
Peanuts	———	———	———	———	———	———	———	———	———	———	———	———	———	———	———	22,969
TOTAL	760,798	797,548	684,010	471,313	330,496	273,812	343,385	328,727	351,001	407,127	537,793	432,297	424,044	452,462	616,237	907,453

NOTE: Actual computations from recorded marketings and prices. It is estimated that these figures represent slightly more than ninety per cent of the actual farm cash income.

PER CENT OF THE TOTAL FARM CASH INCOME IN TEXAS CONTRIBUTED BY EACH OF THE SPECIFIED PRODUCTS FOR THE YEARS 1927 through 1942

	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942
Cotton	59.7	56.3	51.5	44.2	44.8	51.5	58.5	47.5	44.7	44.4	39.8	30.6	29.2	31.1	34.0	29.0
Cottonseed	6.8	6.9	6.3	5.9	4.7	4.8	4.9	7.6	8.4	7.4	5.9	5.0	4.2	4.8	6.6	4.6
Grains‡	7.6	6.6	7.7	9.0	9.8	7.0	5.7	7.8	6.7	7.2	10.4	9.5	8.2	9.4	8.8	9.2
Livestock*	18.5	21.3	23.4	25.3	23.3	18.9	14.6	20.6	22.4	21.6	26.0	30.7	33.5	28.9	24.8	28.7
Livestock Products†	5.6	6.3	7.3	9.9	11.7	9.8	12.6	12.5	13.8	15.0	12.0	18.0	18.5	20.7	21.6	21.0
Fruits and Vegetables¶	1.8	2.6	3.8	5.7	5.7	8.0	3.7	4.0	4.0	4.4	5.9	6.2	6.4	5.1	4.2	5.0
Peanuts	———	———	———	———	———	———	———	———	———	———	———	———	———	———	———	2.5
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

*Includes Cattle, Calves, Hogs, Sheep, Lambs, Chickens, and Turkeys.
†Includes Wool, Mohair, Eggs, Milk products.
‡Includes Oats, Wheat, Grain Sorghum, Rice, and Corn.
¶Includes Citrus Fruits, Vegetable Truck Crops, and Products Canned.
Source: Computed from Official Monthly Production and Price Reports received by the Bureau of Business Research.

Farm Cash Income in Texas by Crop Reporting Districts and by Sources 1941 and 1942

Farm cash income in Texas varies greatly among the various crop reporting districts of the State; and the amount and proportion of income derived from the principal sources also shows marked variation. This situation can best be presented in tabular form where relationships may be seen at a glance.

In each of the two tables on page 4, one covering 1941 and the other 1942, the actual farm cash income for each crop reporting district of the state as computed by this Bureau has been entered according to principal sources of income. In the percentage column to the left of the entries showing income by sources the percentage figures given for each district represent the proportion of the State total received by each district from each source of income. In the percentage column to the right of the entries of cash income for each district the percentage figures represent the proportion of the district total received from each source of income. The State entries in the bottom line of each table show for each year the dollar cash receipts from each source of income and the percentage of the State total.

For example, it will be noted that in 1941 the cash receipts from cotton and cottonseed combined were approximately 250 million dollars which represented almost 41 per cent of the total farm cash income for that year; and the cash income from livestock and livestock products totalled 286 million dollars, or 46 per cent of the Texas farm cash income for that year.

In 1942, as shown in the second table, already referred to, the cash income from cotton and cottonseed combined amounted to approximately 306 million dollars representing nearly 34 per cent of the State total; while the cash income from livestock and livestock products totaled 451 million dollars, or almost half of the entire cash farm income of the State.

Trends of Farm Cash Income in Texas By Sources for the Period 1927–1942

In the two tables on page 5 are entered the cash incomes from agriculture in Texas from 1927 to 1942, inclusive, derived from the principal sources and the percentage of income derived from each source. These data also are shown graphically on the front cover page of the Review.

The foregoing figures do not include government subsidies which for 1942 are expected to amount to approximately 75 million dollars; and as the note of the above table indicates, the computations of farm marketings are an understatement of from 6 to 10 per cent. Thus, actually the cash income of Texas farmers from all sources was approximately one billion dollars during 1942.

Marked changes in the relative as well as the actual income from these sources within the fifteen-year period are to be noted. These trends doubtless indicate fundamental and permanent changes in Texas agriculture and suggest the probable course of future agricultural development in this State.

For example, cotton lint and cottonseed combined accounted for two-thirds of the farm cash income of the state in 1927, the first year in the series, while only one-third of the farm income in 1942 was derived from these sources. On the other hand, livestock and livestock products represented less than one-fourth of the total cash income from agriculture in 1927 whereas in 1942 nearly one-half of the cash income was derived from those sources. Thus, from the standpoint of cash income, cotton is now relatively only half as important as it was in 1927, while livestock and livestock products have become relatively twice as important as they were at that time. It is somewhat amazing that this revolutionary change could have come about in so short a period without more people being conscious of it.

It also is important to note that whereas all of the cotton lint produced in the State and most of the cottonseed enter well established commercial channels and the statistics upon which to compute income are relatively complete, this situation does not prevail with respect to livestock and livestock products. These latter products moreover contribute substantial amounts to the family larder in most Texas homes and thus supplement the cash income derived from these sources.

On the other hand, the statistical data other than for cotton upon which the computations of farm cash income by this Bureau are made are not available in published government reports for the most part, and hence a complete set-up for securing the bulk of this information had to be created. As a result of this situation, the computed income on livestock and livestock products is an understatement to the extent that local slaughterings and other products of local importance are not included in the computed figures. This understatement will gradually be reduced as opportunity is presented for further research and refinement of the data. This development in itself will tend to augment the percentage figures on total cash income derived from livestock and livestock products and reduce proportionally that derived from cotton and cottonseed.

F. A. Buechel.

Texas Enters a New Era of Industrial Development

(EDITOR'S NOTE: This article is intended to convey something of a panoramic view of the newer developments in Texas industry, both as to scope and variety. A fuller development of this subject, together with analyses of trends and regional shifts in industry, and a more complete presentation of the bases for Texas industrial growth will be given in Mr. Johnson's forthcoming bulletin on "Industry Possibilities in Texas.")

Considerable ado is being made of the former agricultural frontier of Texas—as if pioneering in agriculture were a thing of the past. With cotton in the situation it is in, to take one example, it would be strange indeed if considerable pioneering were not ahead for Texas agriculturists, owing to the exigencies forced upon them and the necessity for making widespread adjustments, perhaps almost revolutionary adjustments in the cotton economy of the State.

Too much emphasis can hardly be placed upon the significant changes that have been made in Texas agriculture during the past decade or so, as evidenced by the changing proportions of the sources of Texas farm cash income.

That the economic future of Texas will depend primarily upon the progress of industry in the State, there can be little doubt. But industry will not develop automatically in Texas; instead, it will develop in accordance with the facts regarding the forces of industrialization as an economic movement on the one hand, and the facts regarding the availability of raw materials and natural resources, singly or in combination required by industry on the other hand.

In pointing out the spectacular vistas invisioned for the industrialization of Texas in the near future, however, too little attention is given to the scope of the subject or to the facts in the case. Among these facts are the significance of the State's oil and gas industry as basic to further development of industry, the potential importance of bulk production of forest products and starchy materials produced by agriculture as chemical raw materials, or to the fundamental trends manifested in the evolution of a synthetic organic chemical industry, of which the synthetic rubber industry is but one example—though an outstanding one, spectacular in its immensity.

Still another factor given inadequate attention is the scope and diversity of Texas industry, a feature that has become strikingly apparent in the past several months.

One aspect of this scope of industry development in the State is given by John A. Lee, who writing in the New York *Journal of Commerce* of January 8, 1943, states that for 1942 Texas ranked far ahead of any other state in the South in construction contracts awarded during the year. "Texas was away out front of the procession with contracts totalling well over $1,000,000,000. Florida came next with about $300,000,000 followed by Tennessee, Louisiana, Virginia, Maryland, Oklahoma, Mississippi, and Georgia all with new construction valued at $200,000,000 each.

"These tremendous sums of money went into the building of public housing projects for defense plant works, dams, air fields, pipe lines, chemical process industry plants, and a variety of other types of projects.

"Among the chemical process industries to receive large contracts were magnesium, alumina and aluminum, petroleum, and synthetic rubber and the chemical raw materials. The petroleum refining industry was shouldered with the responsibility of supplying our rapidly growing air forces with 100-octane gasoline. When the war commenced this country had only a small production of this type of fuel; as a result it became necessary to expand facilities as rapidly as possible. It was only natural that many of the new plants were located in such oil centers as are found in Texas, Oklahoma, and Louisiana."

The expenditures of these vast sums in Texas contrast sharply with the amounts of expenditures of just a few years back when an investment of $7,500,000 in a chemical plant in Texas was indeed big news and of the late 1930's when the current expenditures of from $15,000,000 to $20,000,000 annually for modernization of petroleum refineries of the Texas Gulf Coast was regarded as a huge amount. Indeed, the recent announcement of the New York *Journal of Commerce*, that contracts will be awarded soon to Nyotex Chemical Company for the construction of a new $6,000,000 chemical and lime manufacturing plant at Houston, Texas, now almost gets lost in the shuffle.

THE STRATEGIC SIGNIFICANCE OF OIL

Other than agriculture, practically all economic enterprises in Texas are devoted to or are closely associated with the State's oil and gas production and products therefrom—a condition that will be accentuated during the next few years. Many industries are directly dependent upon natural gas as a fuel. Texas oil production is currently running around 35 per cent of the national output, with a daily State production in excess of one and a third million barrels.

It has been repeatedly stated that this is an oil war. Certainly no other single commodity is of greater strategic importance in this global war, and the Texas phase of the oil industry is being geared to the war requirements.

Current national output of oil is a little under 4 million barrels a day—in itself a tremendous amount. But a recent report submitted to the Petroleum Industry War Council forecasts for the last quarter of 1943 a national total at a rate in excess of 4.6 million barrels of crude oil and other hydrocarbons. In view of the large place Texas occupies in the national oil picture, both as to the operations of the industry and as to oil reserves, it is logical to assume that Texas' contributions to these increased demands will be substantial. The accentuated requirements due to the war needs will in time result in the increase of exploration necessary to finding more oil in the ground, and in building new plants

or expanding old ones to convert the crude oil into the needed war products. The current problems of providing adequate transportation for oil and its products need hardly be emphasized at this time.

Oil refinery operations constitute Texas' largest manufacturing industry; and Texas possesses the largest sector of the country's oil refining industry. Oil refining has taken on added interest and almost revolutionary importance through the transformations which this industry has been undergoing during the past few years. These revolutionary changes embrace the large-scale manufacture of new products, new products in the sense that they are derived from petroleum—of synthetics from oil, including toluol for high explosives, high-octane aviation gasoline, butadiene and styrene for synthetic rubber, besides a number of other synthetics including Thiokol, Flexon, Butyl rubber, ethylene glycol (Prestone) and various other synthetic organic chemicals. Currently there is a definite trend toward what are designated as four-way combination cracking plants—which simultaneously yield high-octane aviation gasoline, toluol, butadiene and styrene. Most important of all, perhaps, is the growing recognition of petroleum as a new reservoir of numerous raw materials from which potentially numberless products can be derived.

Just as World War I crystallized the strategic importance to the United States of a synthetic organic chemical industry based upon coal-tar products as raw materials, so is World War II, owing to the stupendous requirements of global war, crystallizing the vital needs and potentialities for a tremendous development of a synthetic organic chemical industry based upon hydrocarbons readily available from petroleum and natural gas. These products simply could not be supplied in sufficient volume by the coal tar industry under the circumstances of the present time. Furthermore, the new chemical industries based upon hydrocarbons from petroleum and natural gas are by no means side issues. They are based upon complicated processes and require expensive plants. As W. L. Nelson has recently observed in *The Oil and Gas Journal*, "the manufacture of raw chemicals for the synthetic-rubber industry may cost $1,000,000,000 and on such a basis, the development of the petroleum-chemical industry in the next score of years may well exceed $10,000,000,000." Surely such potentialities as these should be indicative of trends most important to Texas leadership.

Without question the revolutionary transformation, that has been taking place during the past few years in the new uses of hydrocarbons as chemical building blocks, must rank among the outstanding accomplishments in chemical science, technology, and industry. How vital these developments have been and will be to the war effort will be revealed in years to come.

Owing to Texas' leadership in oil and natural gas production, which means dependable supplies in large volume of these hydrocarbons for some time in the future, it is but logical that a fair share of these new industries should be located in Texas. These more recently recognized new reservoirs of raw materials constitute one of the truly great and outstanding potentials for industry developments of revolutionary proportions in the near future .

Natural gas is coming to be recognized as a vital product also, not only as a source of heat but also as a strategic raw material. Considerable quantities of Texas gas are piped outside the State, even into Mexico, and in Texas as over the Southwest at large, gas is important as an industrial and household fuel. Natural gas as an industrial fuel is of far greater importance in Texas, both actually and potentially, than is commonly recognized. The Texas and Southwestern enterprises engaged in production of heavy chemicals, the manufacture of pulp and paper, and of more recent date the electro-chemical production of magnesium were located in the State largely because of the availability of large quantities of natural gas for fuel purposes.

Natural Gas and the Glass Industry

The glass industry in the United States has long been closely associated with the availability of low-cost and suitable fuel, as is abundantly illustrated in the several steps in the regional shifts which have taken place in the economic development of the industry. If necessary, the glass industry can afford to bring its raw materials from considerable distances but good fuel it must have, and in considering the economics of glass manufacturing, a desirable fuel may be regarded as the most important item. The first step in migration of the glass industry was from the upper Atlantic Seaboard, where it had its small beginnings, across the Appalachians to the Pittsburgh district—to a region of cheap fuel.

In the 1880's the glass industry began its migrations to areas where supplies of natural gas were available—in western Pennsylvania, West Virginia, Ohio, and Indiana—into the region where the glass industry largely remains to this day, and it may be noted, in a region parts of which have had an increased production of natural gas in the past several years and other parts of which are supplied with natural gas from more or less distant sources.

Later still came migration of the glass industry into the Southwest, first into Kansas and then into Oklahoma, which now has a number of plants, and into Louisiana, with the large flat glass plant of Libby-Owens-Ford Company at Shreveport. Libby-Owens-Ford is the nation's largest producer of plate glass as well as of ordinary window glass.

In the further extension of glass plants into the Southwest smaller plants were established in Texas, one of the best known being that of Ball Brothers at Wichita Falls. The latest large development of the glass industry in Texas is the million dollar plant at Waco of the Owens-Illinois Glass Company of Toledo, Ohio. This is to be a modern glass-container making plant. Owens-Illinois Glass Company is the largest glass container manufacturing organization in the world. Also, it may be noted that Knox Glass Bottle Company has built a $200,000 bottle making plant at Palestine.

Factors in the Southwest advantageous to the development of the glass industry include the availability of natural gas, which for glass manufacturing is the ideal fuel. Soda ash supplies are now adequate, owing to the

recent substantial development of the heavy alkali chemical industry in Texas and Louisiana.

Another factor of importance, of course, is the large and growing Texas and Southwestern market for glass products.

Natural Gas an Industrial Fuel

At Laredo is located one of the few antimony smelters on the Western Hemisphere. This plant of the Texas Mining and Smelter Company smelts and refines Mexican ores. It uses both coal and natural gas as fuels. Although normally used mostly in storage batteries, antimony is also 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. Its location was determined by the availability of lignite, the raw material, and by the accessibility of natural gas used as a fuel. 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, a custom smelter, 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 now uses natural gas as fuel; it smelts a variety of ores including gold, silver, lead, and copper ores.

The Nichol's refinery at El Paso, which began operations in January, 1930, produces refined electrolytic copper from blister copper provided by Arizona smelters. In July, 1942, it was reported that this refinery was to be expanded at a cost of $2,650,000. American Smelting and Refining Company expanded facilities at its Amarillo plant in 1941 involving an expenditure of approximately $500,000 and in the same year the American Zinc Company of Illinois, at a cost of some $350,000, expanded the capacity at its Dumas plant where it began operations in Texas in 1936. The Dumas plant uses zinc concentrate ores from New Mexico. 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 constructed a large electrolytic zinc refining plant at Corpus Christi, reportedly costing $5,200,000.

A new tin smelter of the Tin Processing Corporation, the only tin smelter in the Western Hemisphere treating Bolivian tin ores, went into operation at Texas City on April 5, 1942. The smelter was financed by the Defense Plant Corporation, a subsidiary of the RFC; ore is provided through Metals Reserve Company, another RFC subsidiary. When established, it was estimated that the plant would involve an expenditure of $3,500,000; this later was revised upward to $6,500,000. The new smelter, it is reported, is being 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 Indies and formerly operators of a tin smelter at Arnheim, Holland. The initial capacity was set at 18,000 tons of tin annually (requiring between 40,000 and 50,000 tons of Bolivian ore); this output would be about 20 per cent of normal United States market requirements. Early in 1942 it was announced that the capacity would be increased to 30,000 tons of metal.

Texas City was chosen as the location of the smelter on account of port advantages, warehouse facilities, the availability of low-cost natural gas fuel and of hydrochloric acid.

Another important consumer of natural gas is the carbon black industry which in 1939 used 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 out 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 has since been built in the Corpus Christi district.

Carbon black, owing to its use in the tire industry, is of significance in the national defense policy. Moreover, synthetic rubber will require more carbon black per tire than is the case for natural rubber.

Helium in Texas

Helium was discovered in the United States in a sample of incombustible natural gas from a well in Dexter, Kansas, in 1905, by Cady and McFarland of the University of Kansas. The first large-scale government helium plant was built near Fort Worth; this plant began operations in April, 1921, under the supervision of the Navy Department. This 5-unit plant employed a helium extraction process designed by the Linde Air Products Company.

Jurisdiction of this plant was transferred by Congress to the Bureau of Mines on July 1, 1925. Operations at the Fort Worth plant were discontinued until January 10, 1929; it had run for 83 months and had produced 46 million cubic feet of helium. The supply of the helium-bearing gas for the Fort Worth plant came from the Petrolia gas field of Clay County; it was transported through a government owned pipe line.

A commercial natural gas pipe line had been laid from the Petrolia gas field to Fort Worth and Dallas in 1909; from 1911 to 1918 this field was the principal source of natural gas for north Texas cities. It was recognized that the original gas reserves of the field had been considerably depleted by the time the Government became interested in it as a source of helium. This field, however, was the largest source of helium gas then known. The company producing gas in the Petrolia field in 1919 agreed to withdrawals of 10 million cubic feet, for a period of 10 years—but by 1925 it was recognized that the field was entering on its final stage of depletion.

The Nocona oil and gas field (Montague County) had a satisfactory percentage of helium; but the field was being developed by a number of operators whose

primary interest was the production of oil. Owing to the rapid development of the field for oil, the pressure decline in initial rock pressure was rapid—and the project of connecting the Nocona field with the Fort Worth plant was abandoned.

Helium at Amarillo

Following a preliminary survey for helium-bearing natural gas, the Bureau of Mines selected the Cliffside structure, or Bush Dome, in Potter County, for further investigations, which were begun in March, 1926.

This structure was found to cover a considerable area and the gas-producing horizon was about 1,000 feet lower than the corresponding horizon in the Panhandle natural gas producing area to the north. The Cliffside structure, it was recognized, is definitely separated from the main Panhandle gas field by a steep dip or fault.

Although two wells had previously been drilled in the Cliffside field, practically no gas had been removed from the field. The initial rock pressure was 723 pounds per square inch; the gas contained 1.8 per cent of helium. These favorable conditions were enhanced by the fact that the existing leases covered large blocks of acreage. Furthermore, the field was conveniently situated with reference to a favorable location for the development of a helium plant.

When it was concluded that the Cliffside field was the most suitable one found, the Government began negotiations for gas rights on an area about 50,000 acres in extent. Now the Government owns the fee gas rights in the entire structure—thus assuring conservation of the helium-bearing gas.

The Government shortly drilled two more wells, thus giving a total open-flow capacity of some 30 million cubic feet daily. Later a fifth well was added, which when completed had an open flow of some 12 million cubic feet per day.

Construction on the helium plant, located on an 18-acre plot, a few miles west of Amarillo, was begun in August, 1928. It started to operate in April, 1929, and on May 6, 1929, the first shipment of helium left for Langley Field, Virginia.

A continuous process is used to obtain helium from the gas, involving 3 major steps: (a) removal of the carbon dioxide from the natural gas; (b) separation of the helium as a crude mixture of nitrogen and helium, and (c) purification of this mixture. The equipment in 1939 was sufficient to produce 24 million cubic feet a year, but up to that year the plant had never run at full capacity.

From the beginning of operation, April, 1929, to March 1, 1935, the Amarillo plant had produced about 66 million cubic feet of helium. Meanwhile the rock pressure in the Cliffside field had declined from 723 to about 710 pounds per square inch—a reduction of the formation pressure of only about 2 per cent. To date more than 100 million cubic feet have been produced at the Amarillo plant. These facts are indicative of a relatively long life for this field.

For a time in the late 1930's helium production declined, but in 1940 production was stepped up. The Amarillo plant was expanded considerably during 1941. In 1940 the sum of $4,000,000 was made available from Navy Department funds to enable the Bureau of Mines to increase its helium-producing program to provide adequate supplies of helium for medical, scientific, military and industrial uses. A second helium plant located north of Amarillo on the Canadian River is now under construction.

Today the United States, largely due to its supplies in Texas, possesses a world monopoly on helium—one of the "inert" non-inflammable gases which now has been added to the long list of strategic minerals.

Chemical Industry in Texas

Southern Alkali's $7,500,000 ammonia-soda plant producing caustic soda and soda ash at Corpus Christi, which opened in October, 1934, constituted the vanguard in a series of new developments which are revolutionizing the industrial structure of Texas. This plant has from the first produced heavy alkalies, soda ash and caustic soda; later, in 1938, an electrolytic chlorine producing unit costing some $2,000,000 was added.

The addition of the chlorine unit was due to the rapidly expanding demand for chlorine, owing to its increased uses by the rapidly growing bleached sulphate or Kraft pulp industry in the South as well as for water purification. Chlorine was also coming to be an essential material used in the manufacture of certain organic solvents and other chemical products.

Location on tidewater with the advantages of low-cost water transportation, the availability of near-by natural gas in large quantities, the occurrence of salt and lime near by were determining factors in the decision to construct this heavy alkali plant at Corpus Christi; besides these there were a number of contributing factors.

About the same time that Southern Alkali opened its Corpus Christi plant, heavy alkali plants were opened at Lake Charles, Louisiana, by Matthieson Alkali Works and at Baton Rouge by the Solvay Process Company. Both of these Louisiana plants have been vastly expanded and extended since they began producing heavy alkalis. Among other new developments the Matthieson plant at Lake Charles is producing synthetic salt cake in quantity, and is to have an important unit for the production of magnesium.

It may be of interest to note that Southern Alkali is jointly owned by Pittsburgh Plate Glass and American Cyanimid, both large consumers of heavy alkalies. And on January 13, 1943, it was announced that Defense Plant Corporation has two manufacturing units under construction in Texas which will be operated by American Cyanimid and Chemical Corporation for manufacturing catalysts used in the production of aviation gasoline. American cyanimid will operate a large ammonia plant at Etter (a few miles north of Dumas) in the Texas Panhandle.

Prior to the more spectacular developments of recent months, due to the exigencies of war, two important chemical developments were made in Texas, one by Dow Chemical Company, the other by Union Carbide and Carbon Corporation. These developments deserve special attention because of the trends which they represent in a substantial way in the chemical industry.

The original installation of Dow Chemical's plant at Freeport was reported to have cost some $15,000,000. Its primary purpose was to produce magnesium from the small content of magnesium chloride in sea-water. Dow's reason for coming to Texas and to Freeport was given by company officials as due to the "availability of an unlimited supply of raw materials." Magnesium production began early in 1941 and was reported to be at the rate of more than 12,000,000 pounds of metal annually. Since 1915 Dow has been producing magnesium from subsurface brines at Midland, Michigan. Its plant facilities at Midland had grown sufficiently so that by 1941 Dow was producing annually some 12,000,000 pounds of magnesium there. The large actual, and even greater potential, demand for magnesium in properly made alloys was one of the important reasons for Dow's coming to Texas. This demand has been vastly increased by war needs.

Dow purchased a tract of 800 acres, with 3 miles of frontage on the Gulf. Bromine, an essential ingredient in the manufacture of ethylene dibromide for making anit-knock gasoline, is recovered as a by-product of the process. It may be of interest to note that the bromine plant of Ethyl-Dow on Kure Beach, near Wilmington, North Carolina, represents the first successful attempt to extract modern chemicals from sea water. Chlorine will be produced at the Freeport plant and will be used as a process chemical in obtaining the products from the sea-water. Dow also planned from the beginning to produce synthetic organic chemicals at Freeport, using natural gas as a raw material, and a hydro-carbon unit is in operation.

By the time the original Dow plant at Freeport began producing magnesium, the Federal government, operating through the Defense Plant Corporation, decided to treble the magnesium production capacity at Freeport, with the expenditure of large additional funds. Then in November, 1941, an additional 72 million pound plant capacity was authorized by the government, at a cost of $52,000,000. The completion of all these units will give to Freeport an annual capacity of 108 million pounds of magnesium.

But the Dow organization at Freeport is not limited to the production of magnesium, ethylene dibromide, and chlorine. In August, 1941, it was announced that Dow would build a synthetic ammonia plant near Freeport; this plant, to be built on a 4500 acre tract was then estimated to cost $11,000,000. Ammonia is used to produce nitric acid, an essential in the manufacture of explosives. Natural gas is to be used as a raw material, yielding hydrogen by thermal cracking.

In July 1942 the New York *Journal of Commerce* stated that an $18,000,000 styrene plant would be built at Velasco, near Freeport; this plant presumably will be operated by Dow Chemical Company. At the time, it was stated that more than 4,000 men would be employed in constructing the plant and that it would employ regularly 400 or 500 people when in operation.

In November 1942, the building of a $2,500,000 Thiokol plant in Texas was announced; presumably this plant will be in the Freeport district. Dow has also built and operates an auxiliary chlorine-caustic soda plant at Freeport, using brine from wells. These developments will bring the total investment in the Dow operations in the Freeport area to around $100,000,000.

A few years back Carbide and Carbon Chemicals Corporation, a subsidiary of Union Carbide and Carbon Corporation, acquired a tract of 200 acres and on June 1, 1940, started construction of a new chemical plant at Texas City, involving an expenditure of between $5,000,000 and $10,000,000, or perhaps even more; this plant was to have been ready for operation early in the summer of 1941, and the total expenditures have been estimated as high as $15,000,000. The plant was to produce a variety of synthetic organic chemicals for industrial purposes from oil-refinery gases as the raw materials, the latter to be obtained from the near-by modern refinery of Pan-American Refining Corporation. This arrangement for obtaining its raw materials is analogous 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, which will provide the Carbide and Carbon plant with raw materials is new from the ground up, that it is said to utilize the most modern technology and equipment, and that it has constructed a hydro-forming plant to make, among other things, high-octane aviation gasoline.

Union Carbide and Carbon Corporation is a major producer of synthetic organic chemicals and has long used natural gas and oil refinery gases as raw materials, using processes of hydro-carbon chemistry worked out in the company's home plant in the Kanawha Valley of West Virginia.

Pulp and Paper Industry

The rapid, almost spectacular growth of the pulp and paper industry in the South during the past 15 years, did not reach into Texas until in 1940. The great stepping up of growth of Southern pulp and paper came in the 1930's, and was largely confined to the making of Kraft paper used for wrapping paper, bags, and paper board.

In addition to the successful Kraft industry which they support, it had been demonstrated by 1940 that Southern woods could be used for the successful production of a rather wide variety of paper.

Briefly stated, the outstanding advantage of the South for the pulp and paper industry include:

1) The quick growth of wood suitable for pulping purposes,
2) The timber cutting operations can be carried on throughout the year, thus sending cord wood to the mill in a steady stream and therefore obviating the large investment in season cordwood stocks.
3) The large area in the South highly suitable for the growing of timber.

The distribution of the pulp and paper industry in the South reflects the influences of the above mentioned conditions. Louisiana leads all other states by far, with a capacity of 932,275 tons of bleached and unbleached sulphate pulp. Next is Florida with 552,300 tons capacity, followed by South Carolina with 298,500 tons capacity.

The $3,000,000 pulp mill of The Champion Paper and Fiber Company has been in operation at Pasadena, on the Ship Channel near Houston, since 1937, initially producing 200 tons daily of bleached sulphate pulp. This was one of the important steps in the development of industry in Texas.

In June, 1940, The Champion Paper and Fiber Company began operating a new $3,500,000 paper manufacturing unit at their Pasadena 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 shift of the pulp and paper industry into the South. Champion has long been noted for its progressive attitude, its wide field of researches in paper production from various woods of the South, 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 deposits. The new paper mill, producing 100 tons daily, is designed to manufacture in addition to machine coated book paper, bond and envelope paper, all of which are made of pulp manufactured 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 was estimated at $10,000,000 in 1941.

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 national and even the international attention it has received. Its chemical pulp, partially bleached sulphate, used instead of sulphite pulp to mix with the mechanical pulp, is obtained from The Champion Paper and Fiber Company at Pasadena. This $6,000,000 Lufkin plant produces 150 tons of paper daily. New construction including a second newsprint unit and a chemical pulp plant is under way.

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 a high grade wrapping paper and Kraft bags. It was at the Orange, Texas, plant that Mr. Edward H. Mayo in 1911 achieved the distinction, so far as is known, of being 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 which literally swept over that entire region in the two decades following World War I.

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, then director general of the Office of Production Management. Those plans called for a new $17,000,000 steel mill to 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, the latter being the location of the Todd Shipyards. This tract acquired by Sheffield has one mile of frontage on the Ship Channel, and is about 10 miles east of Houston.

Original plans called for building the steel plant with an RFC loan of $12,000,000, to which Armco would add from $3,000,000 to $5,000,000 of its own money. Also scrap was to be used in supplying most of the raw material. The plant is operated by the Sheffield Steel Corporation of Texas, an Armco subsidiary. Sheffield Steel is an experienced consumer of scrap in the manufacture of steel. Sheffield Steel, founded at Kansas City in 1888, is also the largest producer of steel in the Southwest, having four plants in operation at Kansas City, St. Louis, Tulsa, and Houston.

As first planned, the original plant was to consist of three open hearth furnaces, a structural and tie plate mill, a merchant bar mill, reinforcing and rod mills, a wire plant, and hot rolled sheet and plate mills.

It is important to note that this is the first large integgrated steel and finishing plant developed in the Southwest.

As to the situation regarding 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, had 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 iron and steel 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.

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, it was estimated some years ago, that 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. During 1940 some 300,000 tons of scrap iron were shipped annually through the ports of Houston and Texas City; and it was estimated that this amount could be increased to 500,000 tons annually.

The annual output of the new Armco plant initially was to be 200,000 ingot tons. The products include structural shapes, light plates used in shipbuilding, hot-rolled sheets, merchant steel bars, reinforcing bars, wire

rods, wire products and other steel products of open hearth furnaces and rolling mills used in shipbuilding and various other products of a similar nature required in national defense. In making the initial announcement Mr. Knudsen emphasized the establishment of this plant was to be looked upon as the beginning of a permanent industry. The initial plant employing around 2500 people was put into operation early in 1942. Because, however, of the strategic location of the Houston plant in the war effort, plans were soon made to expand the operations here. On November 28, 1941, Jesse Jones announced that a $22,670,855 blast furnace and steel unit, including coke ovens, was to be added to the original plant; this addition is being built by Defense Plant Corporation. In addition to the blast furnace and open hearth furnaces, a 132 inch plate mill and an 84 inch plate mill and finishing facilities are included. As originally planned this plant was to produce annually 274,000 tons of pig iron and 216,000 tons of steel plate. The plant is to be used solely for the manufacture of steel plates for ships, for both naval and merchant vessels.

The total investment in Sheffield operations in Texas amount to more than $40,000,000. Factors considered in making the steel industry of Texas a permanent one include such market factors as:

a) The continued operations of the ship-building industry along the Gulf Coast;
b) The occurrence of oil fields and activities of the oil industry along the coast and in the interior not only of Texas but also of the other Southwestern States.
c) The agricultural market, for barbed wire, agricultural implements and the like.

It was announced in July, 1942, that the Lone Star Steel Company was to begin immediate construction of a $15,000,000 blast furnace in the vicinity of Daingerfield.

The Magnesium Industry

The operations of Dow Chemical Company as regards its magnesium program have been noted briefly elsewhere in this article. Dow got into magnesium production during World War I. In the post-War years there was little demand for magnesium and it was not until 1939 and 1940 that plans for large increases in magnesium production began to crystallize. Now, owing to war requirements for this, the lightest of the light metals, the demands have grown enormously.

Dow has been the pioneer in magnesium production in this country, using an electrolytic process, first from brines from its wells at Midland, Michigan, and later from sea-water at Freeport, Texas, at which location Dow is engaged upon one of the biggest of chemical operations in the United States. The total magnesium Dow is scheduled to produce at Freeport amounts to 108 million pounds annually.

International Minerals and Chemical Corporation have begun operations of a magnesium plant at Austin, Texas. The capacity of the plant as originally announced was 24 million pounds annually and the reported overall cost was to be $12,317,000. Raw materials for this plant, as reported, comprise magnesium chloride from the plant of Union Potash and Chemical Company (a subsidiary of International Minerals and Chemical Corp.) at Carlsbad, New Mexico, and dolomite from the Llano-Burnet region of Texas.

Matthieson Alkali at Lake Charles is constructing a magnesium plant at Lake Charles, Louisiana, which is scheduled to produce 36 million pounds of metal annually. This plant, it is reported, will use dolomite, from the Llano-Burnet region also, as its raw material. This magnesium plant was scheduled to cost $22,500,000.

The Airplane Industry

The Southwest and Texas particularly is playing an important part in the rapidly expanding United States aviation industry. From various points of view the Texas phase of this development constitutes a significant addition to Texas industries.

The $7,000,000 plant at Henley Field, west of Dallas, of the North American Aviation, Inc., has been in operation for some time. (This company is a Pacific Coast plane manufacturer, specializing in military planes). The first steel for construction of the plant arrived in December 1940. Only 8 months later the first three planes made in the plant were turned over to the Army. And on the first anniversary of the arrival of the first steel, the plant turned over 50 Dallas-built planes to the Army and Navy—the biggest single delivery up to that time.

On January 3, 1941, the War Department announced Fort Worth as the site for a $10,000,000 bomber assembly plant, for four-motor bombers to be made from parts manufactured elsewhere. This mammoth plant is operated by the Consolidated Aircraft Corporation of San Diego, California. This plant is strictly an assembly factory, doing no fabricating. A separate plant has been built to supply parts.

This plant, together with the one at Tulsa, will play a vital part in the long-range heavy bomber program. The Fort Worth plant will assemble the Consolidated B-24 four-engined bomber. The original plans called for the Fort Worth plant to be in operation in the middle of 1942. As a matter of fact production began 100 days ahead of schedule. Employing mass-production methods, this Fort Worth plant has been described as having the longest mechanized assembly line in the world. It was announced in August 1942, that quantity production had begun in this plant on a new cargo-transport plane.

The capacity of the plants has, of course, not been made public. The original heavy bombers program called for a total United States output of 500 bombers a month and it was then understood that the Fort Worth and Tulsa plants were to contribute 50 each, per month. The total schedule, however, has been upped considerably, and the schedules of these plants probably have been extended accordingly.

The Fort Worth plant was one of four new Government-financed, private-operated assembly plants, the others being located at Tulsa, Kansas City, and Omaha. The annual production, exclusive of plant construction, was estimated at the outset at $600,000,000. Consolidated Aircraft Corp. will operate the Fort Worth plant;

Douglas Aircraft Co., the one at Tulsa; Glenn L. Martin Co., the one at Omaha; and North American Aviation Co., the one at Kansas City. The Kansas City plant was finished early in 1942.

The Problem of Synthetic Rubber

Currently, of course, considerable attention is focused on the production of synthetic rubber and of its intermediates from petroleum products, and from natural gas. Texas is capable of supplying large quantities of butadiene and styrene, the components of Buna-S rubber. And, inasmuch as isobutylene, the preponderant raw material for Butyl rubber, is a common refinery by-product, Texas is able to supply adequate quantities of this material. Isobutylene is also the raw material for Flexon, a Butyl-like product. The problem of producing adequate amounts of synthetic rubbers under the stress of vital war needs means the rapid creation of a gigantic new chemical industry which under normal circumstances might have taken decades to develop. Certainly achievements that ordinarily would have taken years in development must be telescoped into months. This illustrates, however, the tempo of a large share of the new chemical developments using mass-production methods which have assumed such vital importance in Texas' contributions to the war effort in 1942.

The problem of providing the United States with an adequate synthetic rubber supply seems not to be fully appreciated even at this date. The main steps necessary in building up this gigantic new industry are clear enough, however.

The Baruch Report called for the production of around 1,100,000 tons of synthetic rubber, of which the bulk, some 845,000 tons, would be supplied by Buna-S, generally described as the general, all-purpose synthetic rubber. Production of Butyl rubber was placed at 132,000 tons, and that of Neoprene and Thiokol at 69,000 and 60,000 tons respectively.

Three groups of industries were to have the bulk of the operations of the new Buna-S industry: chemical and petroleum companies to supply the raw material hydrocarbons (butadiene and styrene) required, and the rubber companies to perform the polymerization operations by which synthetic rubbers are made and to manufacture products from the polymerized materials.

On July 15, 1942, Rubber Reserve Corporation provided a schedule of the synthetic rubber industry program, the summary data of which appear in the following tables. These data are given here in order to provide a perspective of the synthetic rubber program. The Baruch Report of September 10 recommended an additional annual capacity of 100,000 tons of butadiene, 20,000 tons of Neoprene, enlarged capacities of styrene and polymerization plants, and the immediate construction of plants to produce alcohol for the rubber program at the rate of 100,000,000 gallons a year. It should be noted alcohol suitable for making butadiene can be produced from petroleum and from natural gas as well as from grains and other starchy substances.

Capacity in tons of butadiene plants scheduled to go into operation in 1942 and the first half of 1943 include the following:

Carbide and Carbon	205,000
Standard Oil (La.)	21,200
Atlas Oil and Refining	12,000
Southern California Gas	25,000
Humble Oil and Refining Co.	30,000
Shell Oil	30,000
Neches Butane Co.	100,000
Rubber Synthetics	50,000
Cities Service	55,000
Koppers United	20,000
Sinclair Rubber	50,000
To be allocated	50,000
Total	648,200

Capacity in tons of styrene plants scheduled to go into operation by the middle of 1943:

Monsanto	35,000
Carbide and Carbon	25,000
Dow Chemical	116,700
Koppers United	35,000
Total	211,700

Capacity in tons of copolymer plants to be finished by October, 1943:

Goodyear	170,000
Firestone	165,000
U. S. Rubber	165,000
Goodrich	145,000
Unallocated	85,000
Total	700,000

Capacity in tons of Butyl plants scheduled:

Standard Oil (La.)	40,000
Humble Oil and Refining Co.	20,000

Subsequently this total for Butyl plants was increased to 132,000 tons. Du Pont was scheduled to produce 40,000 tons of Neoprene; and presumably all of the Thiokol will be produced by Dow Chemical Co.

Certainly a good share of the butadiene and styrene for Buna-S and Butyl as well as Thiokol will be made in Texas. The location of the copolymer plants for making Buna-S from butadiene and styrene is, however, another story.

The first producer of butadiene in Texas was Shell Oil whose $2,000,000 butadiene plant at Shell's Houston refinery began production in 1941. This butadiene produced by Shell is shipped north by tank car.

Early in 1942 the Neches Butadiene Company was formed. This new company, jointly owned by Magnolia Petroleum Company, Gulf Refining Company, The Texas Company, and Pure Oil Company, is building and will operate a large plant in the Beaumont-Port Arthur area for the manufacture of butadiene. All these companies have refineries in the Beaumont-Port Arthur area.

The first units of this plant are estimated to cost $40,000,000.

In June, 1942, Humble Oil and Refining Company, which early got into the production of toluol, closed a contract with the government for the construction of a Butyl-rubber plant to cost approximately $16,000,000. When completed this plant will be operated by Humble under contract with Rubber Reserve Company, a subsidiary of RFC. Prior to this Humble had arranged for a plant to produce butadiene, in which the government invested about $16,000,000. The total investment made for these two plants by the government and Humble totals approximately $43,000,000. Humble will make certain additions and modifications in the refinery in order to supply the refinery gases, which will be used as the raw materials for making the butadiene and the Butyl rubber. At the time of the announcement of these plants, it was reported that they would be in operation in the spring of 1943. Humble will continue with its program for the manufacture of toluol and high-octane aviation gasoline.

Late in 1942 it was announced that the butadiene plant of Sinclair Rubber Company near the Sinclair Refining Company's Houston refinery was under construction, and that it was scheduled to start operations about the middle of 1943. The raw materials, refinery gases, will be supplied by Sinclair Refining Co., Pan-American Refining Corp., and Crown Central Petroleum Corp.

At the same time it was announced that the copolymer operations for making Buna-S rubber will be handled by the Goodyear Tire and Rubber Company in a plant adjacent to the butadiene plant which will be constructed and operated by Goodyear.

Styrene, the other constituent of Buna-S rubber will be supplied from the styrene plant being built by, and which will be operated by, Monsanto Chemical Company at Texas City. Early in 1942 Monsanto had acquired 45 acres of land and the building of the old Texas City sugar refining plant. It was reported that Monsanto's plans originally called for the investment of $3,500,000; later it was reported that the company was to double the operations initially planned.

The *National Petroleum News* of June 10, 1942, reported that Firestone Tire and Rubber Co. had taken an option on 225 acres near the new plant of Carbide and Carbon Chemical Co. at Texas City.

Pure Oil Company will produce Flexon (a Butyl-like rubber) from refinery gases at its Smith's Bluff refinery, near Nederland.

Attention has previously been called in this article to the $18,000,000 styrene plant and the $2,500,000 Thiokol plant which are being built by Dow Chemical Company in the Freeport area.

Hy-car Chemical Company jointly owned by Phillips Petroleum Company and The B. F. Goodrich Company is reported to have constructed a butadiene plant at Borger, Texas. This plant was to have an annual capacity of 15,000 tons, and the Defense Plant Corporation supplied $4,000,000 for construction. The capacity of this plant has since been increased to 45,000 tons annually.

Concluding Statements

This outline of Texas industry intentionally omits numerous industry items, for an inclusive listing would make the paper too long. Emphasis, however, has been placed upon those industry developments which obviously represent the trends of the time and for the maintenance and expansion of which Texas possesses outstanding advantages.

It is important to differentiate the basic wealth-producing industries of the State; these are the market-creating industries and only, if such industries develop fully, can market-following and service industries be counted upon to expand commensurate with the needs of the economy. There are omissions, however, from the basic wealth-producing industries—shipbuilding, the developments in Toluol production, the greatly increased production program for high-octane aviation gasoline and others. Ordnance plants also have been omitted and agricultural processing plants as well. The aim has been to present a portion of the picture of the dynamics of industry development in Texas, something of the bases necessary in obtaining an over-all view of recent, almost revolutionary economic development in Texas, in contrast for instance to static presentations based upon census data which as yet haven't begun to catch up with the larger developments of the Texas industrial scene.

In appraising the potentialities of Texas industry the overall situation must be kept carefully in the forefront. The interdependence of industries and of industrial processes must be given careful consideration. And, most of all, the adequacy of the natural resources bases of the State in furnishing the necessary raw materials in dependable quantity for industry will come in for increased attention in the near future.

To illustrate: we are now faced with the problem of vegetable oils and animal fats, and the shortages in these commodities that may become serious indeed. The manufacture of cooking compounds and of margarine from cottonseed oil has been a growing industry in Texas since World War I. In 1940 Proctor and Gamble announced the building of a million dollar soap plant in Dallas. It is a remarkable fact that the South with an estimated $35,000,000 market for soap had never had a large soap plant, although the raw materials were available in the South.

Now, with the vastly increased demand for glycerine for making explosives, the oils and fats industries and the soap industry are on the list of strategic industries, for glycerine is a by-product of the soap industry, ordinarily. Glycerine, however, may come to be the main industry and soap the by-product. In this connection, also reflecting features of industry interdependence, glycerine can be obtained in quantity from petroleum—but the process requires chlorine—and chlorine is about as scarce and as critical a strategic material as glycerine itself. Another factor, however, will have an influence upon the soap industry since the copolymer plants in which synthetic rubber is to be made will require considerable quantities of soap in the polymerizing operations.

Elmer H. Johnson.

Demands for United States Cotton During the War

Cotton is grown to sell. The demand for United States grown cotton and especially Texas cotton has been altered substantially since 1940 due to the fact that the market has been changed from a world market to a domestic market, and the domestic market has been changed from a market for civilian goods to one predominantly for war goods.

The great majority of cotton mills in the United States were built to consume medium staples and grades of United States grown cotton, and foreign markets took the larger portion of our short staple, low grade cotton as well as our highest grades. A large part of the market we formerly had for low grade, short staple cotton is thus cut off for the duration of the war.

The war itself has shifted the demand of United States cotton mills from the shorter side of medium staples toward the longer staples and better grades.

Reports of United States cotton mills to the United States Department of Agriculture on qualities of cotton consumed supplemented by data on qualities sold by cotton merchants indicate that only about 1% of the demand for cotton is now for staples shorter than 7/8 inch, or about 120,000 bales, whereas production of these staples in the United States amounts to from about 2% to 6%, or from 250,000 to 700,000 bales.

The demand for 7/8 and 29/32 inch staples amounts to about 10% to 13% of total consumption whereas production ranges from 11.3% to as high as 21.3%, and during the five years ending August, 1942, average of 15.3% of the crop. There is apparently some over production of these staples in relation to current demand.

The second largest demand for cotton by American mills is for the staple lengths of 15/16 and 31/32 which account for 25% of the nation's consumption for the years 1939–1940 and 1940–1941 according to the United States Department of Agriculture. That was not only true prior to 1941 but percentages of sales indicate that that is still the case even this year. It is important to note that these two staple lengths alone constitute from 20.9% to 27.6% of the nation's crop. The December estimate indicates that only 20.9% of this year's crop is of these staples. The production of these staples during the five years ending 1943 has averaged 24.8% of the crop. Sales indicate this year's production of these staples will be less than the demand at the present high rate of consumption.

The largest amounts of cotton consumed in the United States are of the staple lengths of inch and 1 1/32 inch. These two staples constituted 36% of total consumption during the years 1930–1940 and 1940–1941 according to the United States Department of Agriculture. Sales to date this year indicate very little change to slight decrease in the demand for these staples. Production of these two staples over the last five years has ranged from 25.4% to 38% of the crop and has averaged 32.3%. This year they constitute 35.4% of it.

Demands for cotton measuring 1 1/16 inch and 1 3/32 inch show a substantial increase from 1939 to the present in the United States. During 1939–1940, 17% of the cotton consumed was of these lengths; in the season 1940–1941 it remained at 17%. Percentage of sales indicate an increase during the year 1941–1942 for these staples and more especially for the year 1942–1943. According to grade and staple estimates reports of the United States Department of Agriculture, there is a wide variation in the percentage of these staples produced, the range during the last five seasons being from a low of 13.1% this year to as high as 20.3% in 1940–1941, and a five year average of 17.2% of the crop.

Demands for cotton 1 1/8 inch and longer normally constitute about 10% to 11% of the nation's total cotton consumption. Sales during the season 1941–1942 indicate an increase in the demand for these qualities. According to reports of the United States Department of Agriculture, there has been a substantial increase in the production of these staples this year from around 8% of the crop to 13.9%. Consumption of these qualities in the United States has normally exceeded production, and the difference was made up by imports especially from Egypt. Cutting off of imports and increased demands for war uses have created real shortages of these staples, and where feasible, farmers should increase production of these staples as a part of the war program. This effort to increase production of long staple cotton should not blind us to the important fact that they are specialities and that the great bulk of the cotton consumed in the United States is 15/16 to 1 1/32 inch.

Facts just cited should be extremely helpful in clarifying the objectives of the cotton production program of Texas this year to make the industry more profitable and more serviceable in winning the war. The loss of the export market and the demand for longer staples in the United States resulting from the war indicate very positively that Texas farmers growing the short staples should shift to varieties producing staples at least 15/16 to 1 1/16 inch for which sales and consumption figures show to be relatively scarce.

Quality differences being paid in the market emphasize the correctness of the above figures and observations. The average discount for 13/16 in the ten designated spot markets in the South is 155 points off 15/16 inch and the local or farm market difference is about 200 off. Even 7/8 inch is worth about $5.00 per bale or 100 points off 15/16 inch.

Premiums for staples longer than 15/16 inch do not reach significant proportions below 1 1/16 inch. Inch cotton is worth about 25 to 30 points, or $1.25 per bale more than 15/16 inch. The premium for 1 1/16 inch staple on the other hand, jumps up to 130 points, or $6.50 per bale more than 15/16 inch.

Consumption figures, market demand, and premiums in the market indicate there is still room for increases in the production of the longer staples. The fact is that while commercial premiums for these longer staples have declined substantially in recent weeks, they are still wide, especially for the very long staples such as is produced by Sea Island, Pima and the Pima-Sakel cross being grown especially in the El Paso irrigated area.

The strong preference of the market for the medium grades of cotton (grades measure the amount of trash, dirt, etc., in the cotton and its preparation) is due to the fact that most United States mills were built to consume these grade qualities. This is significant because the amount of opening and cleaning machinery installed was just sufficient to clean a supply of cotton of these grades to meet the capacity requirements of the mills drawing and spinning equipment. The result is that if such a mill tries to consume lower grades it finds it cannot clean as much cotton as it is set up to draw and spin and the result is a reduction in output.

In view of the facts just cited relative to the demand and the further fact that our mills do not have the capacity to manufacture all of the cotton goods in demand, it is highly important that farmers furnish the mills a sufficient supply of the medium to better grades and medium to longer staples to guarantee maximum production for the war program.

After the war demands for cotton will be discussed later.

A. B. Cox.

COTTON BALANCE SHEET FOR THE UNITED STATES AS OF JANUARY 1

(In Thousands of Running Bales Except as Noted)

Year	Carryover Aug. 1	Imports to Jan. 1*	Government Estimate as of Dec. 1	Total	Consumption to Jan. 1	Exports to Jan. 1*	Total	Balance Jan. 1
1933–1934	8,176	55	13,177	21,408	2,415	4,180	6,595	14,813
1934–1935	7,746	49	9,731	17,526	2,134	2,399	4,533	12,993
1935–1936	7,138	42	10,734	17,914	2,424	3,461	5,885	12,029
1936–1937	5,397	57	12,407	17,861	2,897	3,177	6,074	11,787
1937–1938	4,498	40	18,746	23,284	2,644	3,185	5,836	17,448
1938–1939	11,533	65	12,008	23,606	2,799	1,902	4,701	18,905
1939–1940	13,033	57	11,792	24,882	3,310	3,134	6,444	18,438
1940–1941	10,596	48	12,686	23,330	3,579	601	4,185	19,140
1941–1942	12,367	†	10,976	23,343	4,466	†	4,466	18,877
1942–1943	10,590	†	12,982	23,572	4,713	†	4,713	18,869

*In 500-lb bales.
†Not available.
The cotton year begins in August.

DECEMBER, 1942, CARLOAD MOVEMENT OF POULTRY AND EGGS

Shipments from Texas Stations

Destination‡	Cars of Poultry, Dressed, Chickens, December		Cars of Poultry, Dressed, Turkeys, December		Cars of Eggs, Shell, December		Cars of Eggs, Frozen, December		Cars of Eggs, Dried, December		Shell Equivalent‡, December	
	1942	1941	1942	1941	1942	1941	1942	1941	1942	1941	1942	1941
TOTAL	23†	30¶	198‖	473*	21	10	29	46	75	91	679	830
Intrastate	8	0	13	2	17	4	1	0	16	12	147	100
Interstate	15	30	185	471	4	6	28	46	59	79	532	730

Receipts at Texas Stations

Origin												
TOTAL	14¶	—	3§	2	38	155	6	1	7	12	106	253
Intrastate	11	—	0	1	8	2	1	0	7	12	66	98
Interstate	3	—	3	1	30	153	5	1	0	0	40	155

*Includes 17 cars of live turkeys.
†Includes 2 cars of live chickens.
‡The destination above is the first destination as shown by the original waybill. Changes in destination brought about by diversion orders are not shown.
§Includes 1 car of live turkeys.
¶Includes 1 car of live chickens.
‖Includes 8 cars of live turkeys.

NOTE: Dried eggs and frozen eggs are converted to a shell egg equivalent on the following basis: 1 rail carload of dried eggs = 8 carloads of shell eggs, and 1 carload of frozen eggs = 2 carloads of shell eggs.

EMPLOYMENT AND PAY ROLLS IN TEXAS

December, 1942

	Estimated Number of Workers Employed* Nov., 1942[1]	Dec., 1942[2]	Percentage Change from Nov., 1942	from Dec., 1941	Estimated Amount of Weekly Pay Roll Nov., 1942[1]	Dec., 1942[2]	Percentage Change from Nov., 1942	from Dec., 1941
MANUFACTURING								
All Manufacturing Industries	159,710	162,867	+ 2.0	+ 4.2	4,352,398	4,517,711	+ 3.8	+26.5
Food Products								
Baking	7,890	7,711	− 2.3	+ 9.5	215,889	211,380	− 2.1	+30.7
Carbonated Beverages	3,097	2,980	− 3.8	− 0.2	87,920	83,605	− 4.9	+ 8.4
Confectionery	1,241	1,327	+ 7.0	+ 9.5	14,612	18,062	+23.6	+37.6
Flour Milling	1,905	2,119	+11.2	+ 7.0	41,190	48,468	+17.7	+32.2
Ice Cream	1,249	1,192	− 4.6	+23.1	31,302	29,148	− 6.9	+49.1
Meat Packing	6,645	7,223	+ 8.7	+29.0	196,018	216,041	+10.2	+60.8
Textiles								
Cotton Textile Mills	6,997	6,871	− 1.8	− 1.5	142,145	137,591	− 3.2	+13.9
Men's Work Clothing	5,404	5,332	− 1.3	+34.1	79,959	84,502	+ 5.7	+58.7
Forest Products								
Furniture	1,612	1,592	− 1.2	−32.5	27,558	29,163	+ 5.8	−40.3
Planing Mills	2,275	2,204	− 3.1	+ 1.7	60,825	60,777	− 0.1	+11.0
Saw Mills	16,240	16,371	+ 0.8	− 6.5	253,951	254,487	+ 0.2	+ 2.4
Paper Boxes	825	845	+ 2.4	+17.3	16,856	18,152	+ 7.7	+20.0
Printing and Publishing								
Commercial Printing	2,285	2,351	+ 2.9	− 8.2	65,179	70,582	+ 8.3	+20.0
Newspaper Publishing	4,328	4,473	+ 3.4	−12.7	115,130	118,375	+ 2.8	−14.5
Chemical Products								
Cotton Oil Mills	4,019	4,193	+ 4.4	+ 4.5	55,933	59,608	+ 6.6	+39.8
Petroleum Refining	21,980	22,213	+ 1.1	+ 2.0	1,043,183	1,027,441	− 1.5	+20.1
Stone and Clay Products								
Brick and Tile	1,685	1,878	+11.5	−13.4	26,627	31,152	+17.0	+ 4.4
Cement	1,261	1,251	− 0.8	− 0.1	47,289	45,156	− 4.5	+15.4
Iron and Steel Products								
Structural and Ornamental Iron	2,792	2,881	+ 3.2	+ 9.2	70,090	73,233	+ 4.5	+28.8
NONMANUFACTURING								
Crude Petroleum Production	25,704	25,848	+ 0.6	−15.3	1,039,184	1,074,547	+ 3.4	− 6.2
Quarrying	[3]	[3]	− 2.7	− 8.5	[3]	[3]	− 0.2	+ 5.9
Public Utilities	[3]	[3]	+ 0.8	+ 8.7	[3]	[3]	− 1.6	+15.9
Retail Trade	214,193	251,645	+17.5	+ 4.6	4,460,017	5,045,257	+13.1	+15.7
Wholesale Trade	65,635	64,005	− 2.5	− 5.2	2,194,829	2,252,173	+ 2.6	+ 8.4
Dyeing and Cleaning	2,799	2,780	− 0.7	+ 2.9	50,625	51,494	+ 1.7	+28.9
Hotels	16,758	17,049	+ 1.7	+ 8.1	223,184	231,450	+ 3.7	+21.6
Power Laundries	14,076	14,217	+ 1.0	+21.4	204,128	212,504	+ 4.1	+42.7

CHANGES IN EMPLOYMENT AND PAY ROLLS IN SELECTED CITIES[4]

	Employment Percentage Change Nov., 1942 to Dec., 1942	Dec., 1941 to Dec., 1942	Pay Rolls Percentage Change Nov., 1942 to Dec., 1942	Dec., 1941 to Dec., 1942
Abilene	− 2.0	+ 21.6	− 1.0	+ 16.0
Amarillo	+ 4.3	− 10.9	+ 4.1	+ 5.5
Austin	+ 5.0	+ 33.4	+ 11.2	+ 50.9
Beaumont	+ 4.9	+ 80.1	+ 5.2	+178.6
Dallas	+ 6.3	+ 9.5	+ 8.6	+ 29.9
El Paso	− 1.0	− 3.4	− 2.8	+ 8.6
Fort Worth	+ 9.4	+ 13.0	+ 9.6	+ 45.9
Galveston	− 1.3	+110.4	− 2.7	+126.5
Houston	+ 2.7	+ 7.7	− 5.1	+ 14.6
Port Arthur	+ 0.5	− 7.7	+ 0.4	+ 22.9
San Antonio	+ 0.6	+ 8.8	− 0.3	+ 19.7
Sherman	− 1.7	+ 21.3	+ 4.0	+ 76.5
Waco	+ 4.6	+ 19.9	+ 14.3	+ 57.2
Wichita Falls	+ 0.9	+ 13.5	− 5.6	+ 13.9
STATE	+ 4.7	+ 20.5	+ 0.2	+ 47.3

ESTIMATED NUMBER OF EMPLOYEES IN NONAGRICULTURAL BUSINESS AND GOVERNMENT ESTABLISHMENTS[5]

	1940[1]	1941[1]	1942[1]		1940[1]	1941[1]	1942
January	1,004,000	1,094,000	1,170,000	July	1,024,000	1,156,000	1,317,000[2]
February	1,006,000	1,120,000	1,199,000	August	1,030,000	1,176,000	1,352,000[2]
March	1,030,000	1,120,000	1,226,000	September	1,053,000	1,203,000	1,373,000[2]
April	1,021,000	1,114,000	1,222,000	October	1,065,000	1,219,000	1,384,000[2]
May	1,031,000	1,120,000	1,251,000	November	1,088,000	1,219,000	1,389,000[2]
June	1,026,000	1,134,000	1,291,000	December	1,115,000	1,222,000	

*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] Based on unweighted figures.

[5] 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 Bureau of Labor Statistics.

Due to the national emergency, publication of data for certain industries is being withheld until further notice.

POSTAL RECEIPTS

	December, 1942	December, 1941	November, 1942	Year 1942	Year 1941
Abilene	$ 63,282	$ 44,398	$ 36,045	$ 393,294	$ 339,603
Austin	130,510	102,435	76,977	1,001,942	923,069
Beaumont	58,196	45,295	34,268	415,415	363,467
Brownwood	38,177	25,109	15,814	213,050	181,931
Childress	7,090	2,000	6,074	44,609	31,224
Coleman	5,420	4,860	3,338	40,885	33,806
Corpus Christi	80,845	64,766	147,038	555,491	461,395
Corsicana	14,028	10,156	6,284	91,518	77,164
Dallas	622,451	546,411	419,990	5,091,473	4,961,747
Denison	14,999	11,248	7,818	96,870	82,982
Denton	13,124	10,808	8,187	107,433	96,503
Edinburg	4,696	3,822	3,135	†	†
El Paso	119,428	103,224	70,255	809,753	772,630
Fort Worth	285,000	255,389	205,203	2,196,206	1,969,468
Galveston	68,521	60,464	37,996	484,794	439,449
Graham	10,080*	3,661*	†	†	29,201*
Harlingen	34,154	10,494	8,898	118,303	83,165
Houston	460,514	410,011	277,974	3,568,706	3,411,520
Jacksonville	5,798	4,476	3,495	47,608	42,301
Kenedy	2,499	1,817	1,558	24,993	17,454
Lubbock	43,500*	32,783*	†	†	267,716*
Lufkin	8,896	7,147	5,253	71,143*	†
McAllen	9,254	8,017	4,727	66,147	62,198
Marshall	15,667	10,377	7,943	108,575	82,333
Palestine	9,317	7,669	6,769	77,212	69,209
Pampa	13,882	11,328	6,770	93,556	87,604
Paris	22,647	10,044	10,397	119,321	79,032
Port Arthur	36,283	28,449	19,971	232,087	189,974
San Angelo	30,459	23,208	16,794	196,315	172,020
San Antonio	333,959	249,538	211,190	2,242,660	1,862,658
Sherman	16,632	12,869	11,780	118,664	98,601
Snyder	3,086*	†	1,759*	†	†
Sweetwater	8,555	7,461	5,500	67,706	63,943
Texarkana	31,704	29,755	19,586	†	†
Tyler	27,524	23,934	16,193	208,802	200,452
Waco	61,033	50,719	40,256	484,408	445,874
Wichita Falls	57,238	52,042	35,287	468,325	352,709
TOTAL	$ 2,711,780	$ 2,249,741	$ 1,788,763	$ 19,786,121	$ 18,055,485

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

COMMODITY PRICES

	Dec., 1942	Dec., 1941	Nov., 1942
Wholesale Prices:			
U.S. Bureau of Labor Statistics (1926=100%)	101.0	93.6	100.3
Farm Prices:			
U. S. Dept. of Agriculture (1910–1914=100%)	*	143.0	169.0
U.S. Bureau of Labor Statistics (1926=100%)	113.8	94.7	110.5
Retail Prices:			
Food (U.S. Bureau of Labor Statistics 1935–1939=100%)	132.7	113.1	131.1
Dept. Stores (Fairchild's Publications January, 1931=100%)	113.1	108.3	113.1

*Not available.

CEMENT

(In Thousands of Barrels)

	Dec., 1942	Dec., 1941	Nov., 1942	Year 1942	Year 1941
Texas Plants					
Production	1,043	829	1,021	12,138	9,679
Shipments	789	844	965	12,146	9,843
Stocks	732	739	478	———	———
United States					
Production	14,090	13,810	16,241	182,743	164,029
Shipments	8,923	11,511	14,627	185,168	135,597
Stocks	17,401	19,937	12,231	———	———
Capacity Operated	67.0%	64.8%	80.0%	———	———

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

DECEMBER RETAIL SALES OF INDEPENDENT STORES IN TEXAS

	Number of Firms Reporting	Percentage Changes in Dollar Sales: Dec., 1942 from Dec., 1941	Dec., 1942 from Nov., 1942	Year 1942 from Year 1941
TEXAS	898	+10	+30	+ 5
STORES GROUPED BY LINE OF GOODS CARRIED:				
APPAREL	98	+40	+53	+26
Family Clothing Stores	27	+46	+39	+36
Men's and Boys' Clothing Stores	32	+34	+76	+19
Shoe Stores	11	+49	+29	+39
Women's Specialty Shops	28	+41	+47	+27
AUTOMOTIVE*	52	−64	− 3	−64
Motor Vehicle Dealers	50	−69	− 8	−66
COUNTRY GENERAL	79	+15	+23	+19
DEPARTMENT STORES	52	+28	+56	+16
DRUG STORES	121	+31	+37	+20
DRY GOODS AND GENERAL MERCHANDISE	18	+29	+36	+30
FILLING STATIONS	30	−13	−27	+ 1
FLORISTS	23	+14	+85	+ (a)
FOOD*	141	+29	+10	+27
Grocery Stores	44	+36	+16	+31
Grocery and Meat Stores	88	+26	+ 8	+24
FURNITURE AND HOUSEHOLD*	67	+17	+31	+ 2
Furniture Stores	60	+16	+28	+ 4
JEWELRY	22	+35	+139	+31
LUMBER, BUILDING, AND HARDWARE*	164	−13	+ 4	+ 7
Farm Implement Dealers	7	−15	− 7	+ 5
Hardware Stores	55	−13	+15	+ 5
Lumber and Building Material Dealers	99	−14	− (a)	+ 6
RESTAURANTS	18	+60	+ 7	+26
ALL OTHER STORES	13	+33	+31	+26
TEXAS STORES GROUPED ACCORDING TO POPULATION OF CITY:				
All Stores in Cities of—				
Over 100,000 Population	145	+14	+46	+ 4
50,000–100,000 Population	109	+18	+29	+ 9
2,500–50,000 Population	433	+ 6	+26	+ 1
Less than 2,500 Population	211	− 4	+ 9	+ 4

*Group total includes kinds of business other than the classifications listed.

(a) Change of less than .5%.

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

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

	Cattle		Calves		Hogs		Sheep		Total	
	1942	1941	1942	1941	1942	1941	1942	1941	1942	1941
Total Interstate Plus Fort Worth	3,976	3,807	1,053	1,174	1,129	727	745	336	6,903	6,044
Total Intrastate Omitting Fort Worth	1,189	346	249	104	37	19	156	46	1,631	515
TOTAL SHIPMENTS	5,165	4,153	1,302	1,278	1,166	746	901	382	8,534	6,559

TEXAS CAR-LOT* SHIPMENTS OF LIVE STOCK FOR YEAR 1942

	Cattle		Calves		Hogs		Sheep		Total	
	1942	1941	1942	1941	1942	1941	1942	1941	1942	1941
Total Interstate Plus Fort Worth	61,329	43,634	13,984	12,748	11,947	9,503	12,841	9,125	100,101	75,010
Total Intrastate Omitting Fort Worth	9,934	5,937	1,953	1,595	350	195	1,849	1,126	14,086	8,853
TOTAL SHIPMENTS	71,263	49,571	15,937	14,343	12,297	9,698	14,690	10,251	114,187	83,863

*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 United States Bureau of Agricultural Economics 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.

DECEMBER RETAIL SALES OF INDEPENDENT STORES IN TEXAS

	Number of Firms Reporting	Percentage Changes in Dollar Sales: Dec., 1942 from Dec., 1941	Dec., 1942 from Nov., 1942	Year 1942 from Year 1941
TOTAL TEXAS	898	+10	+30	+ 5
TEXAS STORES GROUPED BY PRODUCING AREAS:				
District 1–N	59	+28	+28	+14
Amarillo	20	+25	+32	+ 9
Plainview	13	+23	+15	+35
All Others	26	+20	+19	+12
District 1–S	23	+25	+16	+23
District 2	64	+20	+34	+16
Wichita Falls	11	+12	+31	− 4
All Others	53	+23	+35	+17
District 3	32	+10	+36	+ 6
District 4	186	+29	+51	+13
Dallas	33	+14	+47	− 2
Fort Worth	26	+19	+44	+12
Sherman	11	+20	+21	+18
Waco	19	+57	+56	+56
All Others	101	+31	+29	+11
District 5	86	+13	+34	+10
District 6	33	+30	+ 9	+13
El Paso	19	+20	+ 2	+20
All Others	17	+57	+29	+11
District 7	50	+11	+38	+ 9
San Angelo	12	+23	+44	+20
All Others	29	− 5	+29	+ 8
District 8	148	+27	+42	+20
Austin	18	+18	+40	+23
Corpus Christi	10	+46	+28	+44
San Antonio	41	+17	+42	+10
All Others	78	+23	+26	+19
District 9	102	+25	+50	+14
Beaumont	14	+36	+46	+34
Houston	45	+ 8	+45	+ 2
All Others	44	+36	+48	+13
District 10	27	+30	+30	+12
District 10–A	41	+30	+25	+18
Brownsville	11	+23	+25	+21
All Others	30	+35	+25	+18

NOTE: Prepared from reports of independent retail stores to the Bureau of Business Research, coöperating with the U.S. Bureau of the Census.
The total number of firms reporting does not check exactly with the totals of the cities because some motor vehicle dealers whose sales varied radically from the sales of other stores in their respective cities were omitted when working the percentage changes for those cities. This was done only when the sales of motor vehicle dealers were an unusually large proportion of the total sales of a city.

PETROLEUM

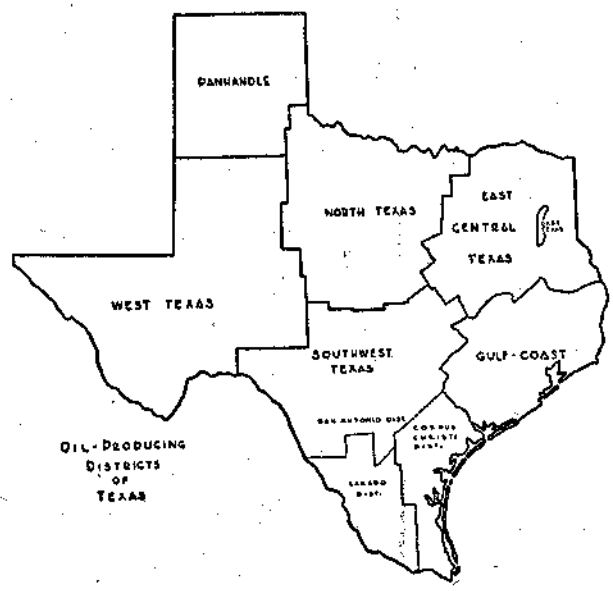
Daily Average Production

(In Barrels)

	Dec., 1942	Dec., 1941	Nov., 1942
Coastal Texas*	312,900	302,250	312,800
East Central Texas	101,040	87,470	95,200
East Texas	347,780	383,480	354,800
North Texas	137,950	140,350	137,600
Panhandle	92,460	92,300	89,800
Southwest Texas	174,910	224,240	117,300
West Texas	208,510	300,890	212,200
State	1,384,550	1,530,980	1,375,700
United States	3,871,640	4,130,100	3,877,150

*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: November, 1942, 145,768,000 gallons; November, 1941, 132,176,000 gallons; October, 1942, 114,637,000 gallons.



TEXAS COMMERCIAL FAILURES

	Dec., 1942	Dec., 1941	Nov.,† 1942	Year 1942	Year 1941
Number	1	15	4	126	254
Liabilities*	$24	$194	$18	$1,795	$5,496
Assets*	4	144	12	1,248	2,709
Average Liabilities per failure*	24	13	5	14	22

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

PERCENTAGE CHANGES IN CONSUMPTION OF ELECTRIC POWER

	Dec., 1942 from Dec., 1941	Dec., 1942 from Nov., 1942	Year 1942 from Year 1941
Commercial	+ 7.5	− 4.7	+14.4
Industrial	+16.5	+ 3.2	+ 6.6
Residential	+ 6.9	+ 3.0	+ 6.3
All Others	+18.8	+ 1.0	+11.5
TOTAL	+13.5	+ 1.5	+ 8.5

Prepared from reports of 8 electric power companies to the Bureau of Business Research.

DECEMBER CREDIT RATIOS IN TEXAS DEPARTMENT AND APPAREL STORES

(Expressed in Per Cent)

	Number of Stores Reporting	Ratio of Credit Sales to Net Sales 1942	Ratio of Credit Sales to Net Sales 1941	Ratio of Collections to Outstandings 1942	Ratio of Collections to Outstandings 1941	Ratio of Credit Salaries to Credit Sales 1942	Ratio of Credit Salaries to Credit Sales 1941
All Stores	47	49.7	59.7	60.8	42.4	0.8	0.7
Stores Grouped by Cities:							
Austin	5	45.0	51.3	75.7	52.6	0.5	0.8
Dallas	7	58.1	66.6	55.5	39.9	0.6	0.5
Fort Worth	3	45.7	57.5	66.4	44.1	1.2	1.0
Houston	7	49.9	64.3	56.9	40.6	1.1	1.0
San Antonio	3	40.8	51.7	66.7	46.6	1.2	1.1
Waco	4	40.9	49.7	71.3	42.5	1.2	1.2
All Others	18	43.3	53.7	71.7	45.2	0.7	0.7
Stores Grouped According to Type of Store:							
Department Stores (Annual Volume Over $500,000)	11	47.9	57.8	63.0	44.9	0.9	0.8
Department Stores (Annual Volume under $500,000)	9	40.5	49.5	65.4	44.2	0.9	1.0
Dry-Goods-Apparel Stores	3	47.5	57.1	66.2	45.8	1.2	1.2
Women's Specialty Shops	12	59.5	68.7	59.9	37.1	0.5	0.4
Men's Clothing Stores	12	47.3	60.2	59.6	41.7	0.9	0.9
Stores Grouped According to Volume of Net Sales During 1941:							
Over $2,500,000	7	52.6	59.9	59.3	43.2	0.8	0.7
$2,500,000 down to $1,000,000	6	47.4	63.0	60.7	43.9	0.9	0.8
$1,000,000 down to $500,000	8	44.5	52.6	69.2	43.7	1.0	0.9
$500,000 down to $100,000	23	38.3	50.4	71.3	45.2	1.3	1.5
Less than $100,000	2	39.7	57.1	68.2	45.8	1.5	1.5

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.

TEXAS CHARTERS

	Dec., 1942	Dec., 1941	Nov., 1942	Year 1942	Year 1941
Domestic Corporations:					
Capitalization*	$56,721	$ 1,658	$ 176	$63,990	$12,552
Number	32	63	28	676	835
Classification of new corporations:					
Banking-Finance	1	2	0	9	39
Manufacturing	3	10	5	81	117
Merchandising	5	6	5	86	176
Oil	6	12	2	52	94
Public Service	0	1	0	4	10
Real Estate Building	7	13	7	241	157
Transportation	3	2	1	36	26
All Others	7	22	8	163	221
Number capitalized at less than $5,000	6	28	15	328	322
Number capitalized at $100,000 or more	4	5	0	18	24
Foreign Corporations (Number)	14	23	10	147	200

*In thousands.

NOTE: Compiled from records of the Secretary of State.

LUMBER

(In Board Feet)

	Dec., 1942	Dec., 1941	Nov., 1942
Southern Pine Mills:			
Average weekly production per unit	239,786	293,585	264,439
Average weekly shipments per unit	263,526	284,992	286,822
Average unfilled orders per unit, end of month	1,587,722	1,231,622	1,531,237

NOTE: From Southern Pine Association.

BUILDING PERMITS

	December, 1942	December, 1941	November, 1942	Year 1942	Year 1941
Abilene	$ 3,380	$ 50,140	$ 1,750	$ 1,180,028	$ 1,100,925
Amarillo	43,795*	161,200*	†	†	2,757,478*
Austin	33,748	330,012	14,133	1,587,223	5,414,259
Beaumont	30,935	106,868	27,133	3,621,220	2,240,611
Brownwood	49,350*	†	81,465*	†	†
Coleman	0	582	450	†	181,641*
Corpus Christi	1,048,692	163,012	90,860	5,113,810	12,062,331
Corsicana	2,300	11,625	750	156,939	165,042
Dallas	277,172	1,501,276	389,711	6,561,617	17,264,570
Denton	150	7,350	1,300	50,513	337,449
Edinburg	1,010	7,945	440	†	†
El Paso	62,355	190,556	121,767	2,608,644	3,088,363
Fort Worth	775,545	14,553,725	147,937	11,018,898	19,680,171
Galveston	11,355	61,725	20,317	1,448,303	5,255,587
Graham	0	1,950	0	18,008	101,840
Harlingen	950	37,600	4,710	102,160	420,545
Houston	61,890	1,045,155	196,899	11,292,009	19,215,441
Jacksonville	500	2,000	0	13,950	98,736
Lubbock	7,862*	156,994*	†	†	3,684,216*
Lufkin	1,784*	7,925*	†	†	529,483*
McAllen	2,895	16,500	2,120	150,433	199,911
Marshall	3,784	63,864	7,093	201,517	492,989
Midland	0	97,925	2,805	283,161	638,275
New Braunfels	485	4,595	1,485	39,609*	†
Palestine	125	5,611	1,175	39,161	247,266
Paris	4,125	15,050	2,185	225,715	348,163
Plainview	0	6,450	260	10,465	78,869
Port Arthur	11,670	30,971	8,801	330,899	1,178,308
San Antonio	419,693	412,533	346,464	4,872,476	7,067,651
Sherman	4,031	37,672	6,103	343,284	406,288
Sweetwater	1,405	31,360	1,835	67,503	195,970
Texarkana	53,789	63,182	19,509	†	†
Tyler	9,074	147,956	2,663	218,473	901,118
Waco	66,300	64,257	139,896	1,350,877	2,849,309
Wichita Falls	2,539	866,136	58,148	643,546	3,529,597
TOTAL	$ 2,889,897	$ 19,960,283	$ 1,618,699	$ 53,510,832	$104,761,225

*Not included in total.

†Not available.

NOTE: Compiled from reports from Texas Chambers of Commerce to the Bureau of Business Research.

BANKING STATISTICS

(In Millions of Dollars)

	December, 1942 Dallas District	December, 1942 United States	December, 1941 Dallas District	December, 1941 United States	November, 1942 Dallas District	November, 1942 United States
Debits to individual accounts	$ 1,833	$64,990	$ 1,573	$56,582	$ 1,489	$50,673
Condition of reporting member banks on—	December 30, 1942		December 31, 1941		December 2, 1942	
Assets:						
Loans and investments—total	$ 987	$41,467	$ 687	$30,085	$ 907	$38,387
Loans—total	312	10,321	374	11,370	305	10,295
Commercial, industrial, and agricultural loans	228	6,068	256	6,728	224	6,192
Open market paper	—	239	2	423	—	248
Loans to brokers and dealers in securities	3	850	11	537	4	700
Other loans for purchasing or carrying securities	13	402	16	422	11	389
Real Estate loans	20	1,199	22	1,258	20	1,207
Loans to banks	—	53	—	35	—	22
Other loans	48	1,510	67	1,967	46	1,537
Treasury Bills	61	3,786	35	883	70	3,570
Treasury Cert. of indebtedness	127	4,955	†	†	82	3,429
Treasury Notes	106	4,171	39	2,535	108	4,241
U.S. Bonds	284	12,982	138	8,667	242	11,644
Obligations guaranteed by U.S. Government	40	1,937	40	2,964	40	1,924
Other Securities	57	3,314	61	3,666	60	3,284
Reserve with Federal Reserve Bank	283	9,431	190	9,825	281	9,483
Cash in Vault	20	559	15	555	18	516
Balances with domestic banks	297	2,598	288	3,255	292	2,768
Other Assets—net	31	1,160	32	1,153	32	1,222
Liabilities:						
Demand deposits—adjusted	821	28,257	602	23,650	829	28,852
Time deposits	132	5,233	133	5,348	130	5,204
U.S. Government deposits	142	6,780	44	1,495	47	3,116
Inter-bank deposits:						
Domestic banks	421	9,141	334	9,040	423	9,454
Foreign banks	2	736	1	656	1	709
Borrowings	—	1	—	1	—	1
Other liabilities	5	1,055	6	770	5	1,022
Capital account	95	4,012	92	3,913	95	4,018

†Not available.

Note: From Federal Reserve Board.

CONTENTS