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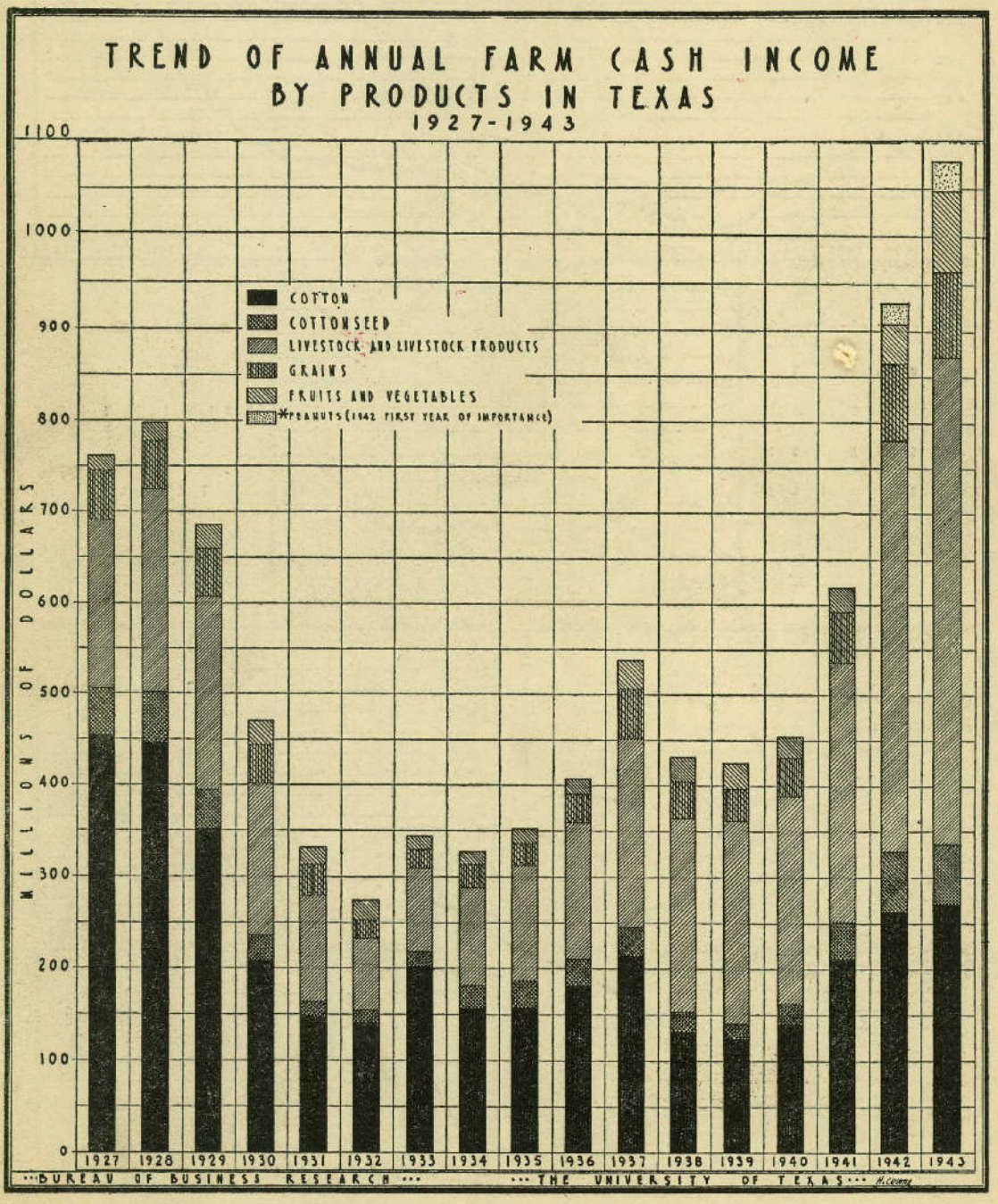
By the Staff of the Bureau of Business Research, The University of Texas
F. A. Buechel, Editor.



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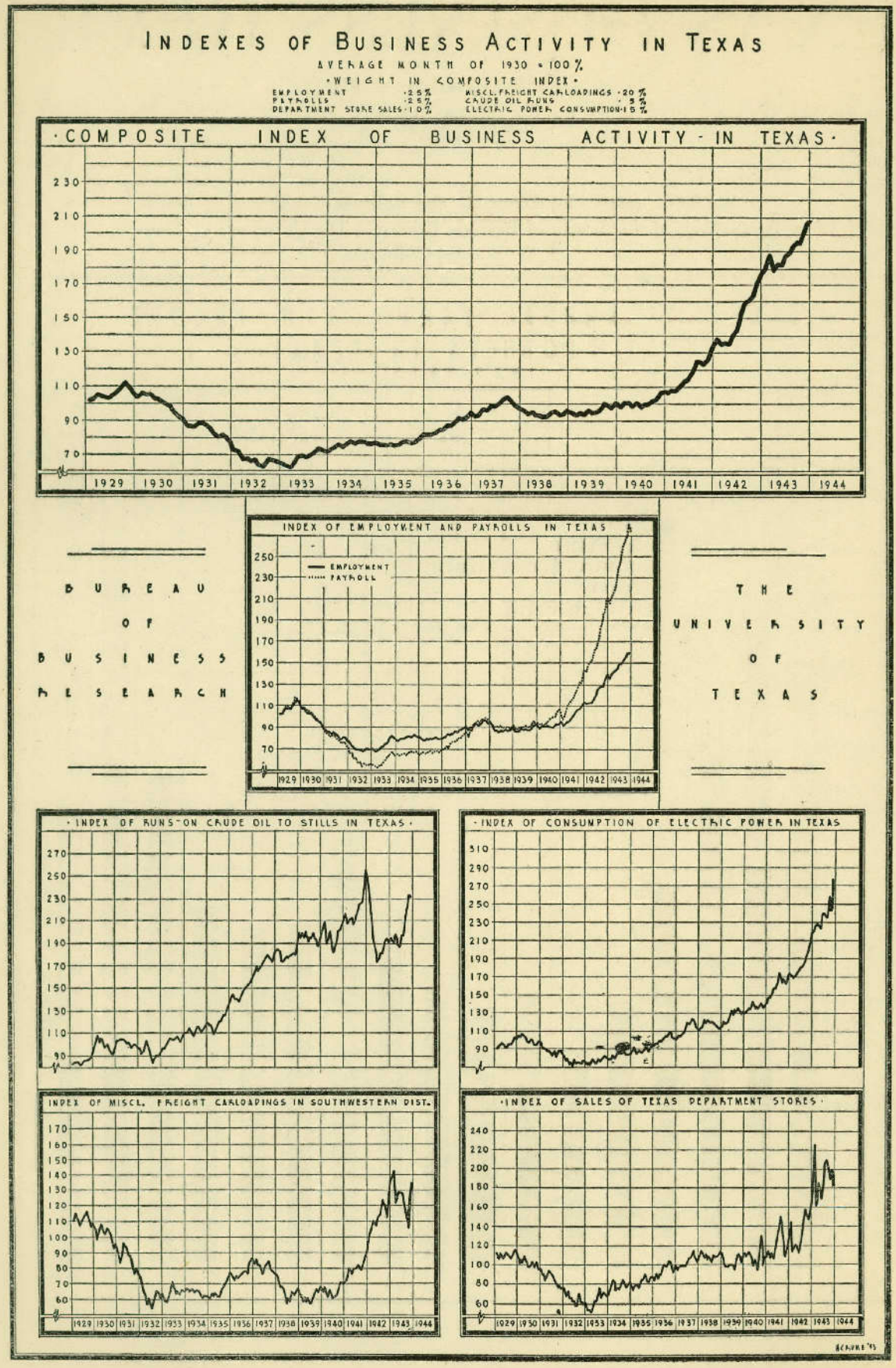

INDEXES OF BUSINESS ACTIVITY IN TEXAS
AVERAGE MONTH OF 1930 = 100%
WEIGHT IN COMPOSITE INDEX
EMPLOYMENT 25%
PAYROLLS 25%
DEPARTMENT STORE SALES 10%
MISCL. FREIGHT CARLOADINGS 20%
CRUDE OIL RUNS 5%
ELECTRIC POWER CONSUMPTION 15%
COMPOSITE INDEX OF BUSINESS ACTIVITY IN TEXAS
230
210
190
170
150
130
110
90
70
1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941 1942 1943 1944
BUREAU OF BUSINESS RESEARCH
INDEX OF EMPLOYMENT AND PAYROLLS IN TEXAS
EMPLOYMENT
PAYROLL
250
230
210
190
170
150
130
110
90
70
1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941 1942 1943 1944
THE UNIVERSITY OF TEXAS
INDEX OF RUNS ON CRUDE OIL TO STILLS IN TEXAS
270
250
230
210
190
170
150
130
110
90
INDEX OF CONSUMPTION OF ELECTRIC POWER IN TEXAS
310
290
270
250
230
210
190
170
150
130
110
90
INDEX OF MISCL. FREIGHT CARLOADINGS IN SOUTHWESTERN DIST.
170
160
150
140
130
120
110
100
90
80
70
60
1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941 1942 1943 1944
INDEX OF SALES OF TEXAS DEPARTMENT STORES
240
220
200
180
160
140
120
100
80
60
1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941 1942 1943 1944

Business Review and Prospect

The central post-war economic problem presented to the leaders of industry, finance, labor, government, and education in the United States is that of creating and maintaining an economy in which the actual and potential achievements of science and technology may be promptly translated into greater production, and in which there may be a comparable buying power broadly distributed throughout the nation. It is not difficult to state the problem, but there is a great deal of honest difference of opinion as to whether the problem can be solved, and if so, how. Certainly the problem cannot be left to solve itself any more than the military problem which confronted the nation after Pearl Harbor could have been left to solve itself. It requires the unified and determined effort of the five factors mentioned above, plus the public consciousness that its leadership is trustworthy and efficient, to achieve our military objective; the same elements, both with respect to leaders and the public, will be needed to solve the peacetime problem which lies ahead. Because reason and common sense must be relied upon in the solution of the intricate post-war problems, the responsibility resting upon the agencies of education, whether within or outside of schools, cannot be exaggerated.

In an effort to determine the outlook for various types of materials which might greatly influence post-war economy, Barron's magazine recently distributed a questionnaire among several hundred heads of research organizations throughout the country. More than 90 per cent of those who replied predicted a "marked growth" for plastics, plywood, and the light metals, aluminum and magnesium, during the ten years following the war in comparison with the pre-war period. Comments made by the research heads reflect widely varying viewpoints. Some of the observations quoted by Barron's appear quite significant. For example, one research director is credited with this statement, "The general opinion that there is being built up a large deferred demand for replacement goods that will have to be satisfied after the war is obviously to be accepted—but over a ten-year period it is doubtful if this market will consume any (greater) amount of the conventional metal and non-metallic materials than were used in the pre-war period over a comparable time.

"It is possible that if business and industry are given the proper encouragement they will feel justified in taking the risks so that there will be an actual increase in the amount of iron, steel and copper, and in lumber, cement, clay and other ceramic products; but the relation as regards growth will probably still be in favor of the new light alloys, new types of building materials, the new fibers and organic synthetics."

Other comments received from the research heads indicated that they had more fear of restrictive and regulatory action than they did of the absence of constructive measures by business and industry. One said, "Industry has a wide field and an abundant opportunity if we don't strangle it with regulations and political bickerings." Another, fearing an attempt to regulate prices, says, "In my opinion the greatest danger to post-war business consists in the tendency to try to maintain high prices. This hinders movement of materials into trade channels and further depresses the already lessened demand for materials."

"A drastic decrease in raw materials prices, as well as abandonment of overtime and excessive wage hour rates, will be needed to get post-war business going."

It is the conviction of the research men that higher production and subsequent movement of goods through normal trade channels are dependent upon freedom not only from price restrictions but also from interference by oganized labor. Fear was expressed that "Labor will be so arbitrary after the war that it will be unmanageable," and there was a belief that industry in self-defense will have to decentralize its operations more and more, splitting them up into a larger number of smaller concentrations of labor.

On one side of the picture research men see a post-war world with vast new possibilities in housing, transportation and other "better things for better living" as well as unprecedented opportunities for bringing these things within the reach of millions, through the application of mass production methods. They see labor-saving devices contributing to an increasing extent to time which will be available for education and travel. They see standards of living rising ever higher and higher.

On the other side of the picture are those who see "A post-war world mismanaged by politicians with price restrictions here and trade barriers there, an economy of abundance giving way to a controlled scarcity, rising taxes competing with rising new industries, organized labor opposing some things that in the long run seem most likely to benefit it most."

Which of the foregoing sides of the picture will our post-war world turn out to be? That will depend upon what our leadership in industry, finance, labor, government and education turns out to be; and the type of leadership we have will, in turn, be based upon such basic considerations as the mass character, mass intelligence and mass determination of the American people. In a true democracy the leadership is a reflection of the fundamental qualities of the people as a whole.

Texas Business

In its potentialities for the production of many of the materials indicated by the leaders of research as having the best growth prospects Texas ranks high. It is because of the significance of these types of materials to the future economy of Texas that so much thought is being given to the analysis of the natural resources from which these materials are derived and briefly outlined in the Texas Business Review. As a matter of

fact, special emphasis has been placed upon this subject for many years in this Bureau and is reflected in a long series of articles in the REVIEW.

CURRENT BUSINESS ACTIVITIES IN TEXAS

In view of the sharp and persistent rise which has characterized Texas industry and trade since the winter of 1941, it is to be expected that a rounding off of the Texas business curve will occur in the relatively near future. How long business will remain on the high plane which has been reached is a matter of conjecture. It is generally expected that the collapse of Germany and the resulting decline in war production will necessitate rather drastic readjustment in a number of industries in Texas, notably aircraft, shipping, and ordnance production. War production will remain at a high level, however, until Japan is defeated, which, according to present expectations, may occur in 1945. In the meantime, production of civilian goods is expected to gain momentum as more and more materials become available, and this fact will offset, in a measure at least, the decline in war production.

Virtually no change occurred in the Texas composite business index for December.

DECEMBER INDEXES OF BUSINESS ACTIVITY IN TEXAS

(Average Month of 1930=100%)

	Dec., 1943	Dec., 1942	Nov., 1943
Employment	161.5	140.4	161.4
Pay Rolls	276.3	210.2	280.5
Miscellaneous Freight Carloadings (Southwest District)	134.9	135.2	121.8
Runs of Crude Oil to Stills	232.4	189.3	233.5
Department Store Sales	182.6	148.8	199.7
Electric Power Consumption	278.2	246.2	267.5
Composite	208.0	177.1	207.9*

*Revised.

The employment index remained unchanged from November but was well above that of December a year ago. The pay roll index was down moderately from November, but was more than 30 per cent above December, 1942. All of the remaining indexes were well above a year ago but only the indexes of electric power consumption and carloadings showed gains over November.

It is not expected that the rise in total income in Texas from 1943 to 1944 will approximate even closely the gain from 1942 to 1943 when it rose from $4.2 billion to $5.5 billion (according to this Bureau's computations), but it is expected that the 1944 level of income will be somewhat higher than that of 1943. Dollar sales at retail are estimated at between $2.5 and $3.0 billion for 1943. It is more difficult to estimate total retail sales now than in peacetime years because of the widely varying effects of war conditions upon the different lines, sizes and locations of retail establishments.

FARM CASH INCOME

Cash income from farm marketings in Texas during December was substantially below that of the corresponding month last year. Income for the month totalled only $64 million compared with $73 million during December last year, a decline of more than 12 per cent. The drop in income was the result mainly of a sharp decline in marketings of cotton, cottonseed, and cattle, a result of drouth conditions in late summer and fall. Moreover, the average prices of cattle were moderately below those in December last year. This was the second year-to-year decline in farm cash income for the year 1943, the previous instance having occurred in October.

Aggregate farm cash income for the year 1943, excluding Federal subsidies, was $1,087 million as computed by this Bureau. This figure is an understatement of at least 6 per cent and possibly as much as 10 per cent. The comparable figure for 1942 was $931 million. The increase in farm cash income over 1942 was thus approximately 17 per cent. The 1943 cash income from Texas farms and ranches is by far the largest of any year in which computations have been made by this Bureau, which date from 1927, although it is nearly 10 per cent less than was expected earlier in the year.

INDEXES OF AGRICULTURAL CASH INCOME IN TEXAS

(Average Month of 1928–1932=100%)

Districts	December 1943	November 1943	December 1942	Computed Cash Income Cumulative to January 1943	Computed Cash Income Cumulative to January 1942
1–N	139.0	225.2	201.3	108,537	85,968
1–S	150.2	267.0	298.7	107,228	96,377
2	117.4	149.8	159.3	108,958	124,352
3	264.3	257.1	273.4	51,890	51,361
4	231.4	235.3	190.5	188,361	162,702
5	313.4	177.6	261.8	86,274	61,405
6	130.7	233.6	422.1	48,566	49,033
7	146.3	236.1	174.6	71,175	70,267
8	206.4	198.4	221.1	110,126	87,265
9	373.5	463.2	474.5	90,226	68,613
10	390.5	325.9	520.8	33,219	24,373
10–A	635.4	841.5	271.3	82,657	49,995
STATE	224.3	236.4	254.6	1,087,217	931,711

NOTE: Farm cash income as computed by this Bureau understates actual farm cash income by from six to ten 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 specialities of local importance in scattered areas throughout the State. This situation, however, does not impair the accuracy of the *indexes* to any appreciable extent.

Income from livestock and livestock products totalled approximately $535 million compared with a cash income of less than $340 million from cotton and cottonseed combined. Thus cash income from livestock and its products accounted for one-half of the state's farm cash income, while cotton and cottonseed brought in less than one-third of the total income.

The combined cash income from milk, eggs, fruits and vegetables as computed in this Bureau was nearly equal to that from cotton lint. If allowance is made for

the understatement in the computation of these three classes of products because of the incompleteness of the figures on local marketings, it is more than probable that their actual cash income was greater than for cotton lint. Moreover, a considerable portion of the production of these three classes of products is consumed on the farms and thus may be added to the farmers' cash income, whereas all of the lint cotton produced enters commercial channels. It should be noted in this connection that feed derived from cottonseed contributes much to the livestock industry in Texas and this fact deserves careful consideration. From a waste product not so many decades ago cottonseed has thus come to occupy a position of prime importance in the state's agricultural economy. Here, then, we have striking illustrations of the radical shifts which are taking place in Texas agriculture.

The following table indicates the changes in farm cash income in Texas by products, in considerable detail, for the seventeen years from 1927 to 1943 inclusive. The question is, will the trends here shown continue; especially as regards cotton and cottonseed, the livestock and livestock products group and the fruits and vegetables group?

Comparing the 1927 cash income from cotton and cottonseed with the income from this source in 1943, it will be noted that there was a decline of 37 per cent. During this period cash income from cattle rose from $101 million to $181 million, or a gain of nearly 80 per cent. Cash income from calves rose from $15 million to $41 million, a gain of 173 per cent; hogs from less than $8 million to $48 million, a gain of 500 per cent; eggs from $23 million to $72 million, a gain of 213 per cent; milk and milk products from $23 million to $98 million, a gain of 330 per cent; and fruits and vegetables from $17 million to $90 million, a gain of 430 per cent.

As industrialization proceeds in Texas the local markets will expand for the products of many of the so-called minor farm enterprises such as dairying, poultry raising and egg production, and this factor will contribute to a higher price level and more stable prices for these products. Farmers are placing greater emphasis upon inceasing the production of milk per cow and the number of eggs per hen, as well as giving more attention to the quality of these products. It would appear logical to expect a substantial expansion of these types of agricultural enterprises in central and eastern Texas for many years to come. Thus a continuous flow of income will supplement the seasonal income from cotton and contribute to the revival of the vast area which at one time was the backbone of the state's agriculture.

F. A. Buechel.

TREND OF FARM CASH INCOME IN TEXAS 1927-1943

($000)

Product	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943
Cotton	454,117	447,350	353,207	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	271,356
Cottonseed	69,376	75,566	60,370	42,559	21,644	18,672	25,929	35,792	41,792	43,804	46,493	31,818	25,959	31,849	59,097	63,264	68,167
Wheat	21,698	23,225	34,565	22,859	17,517	8,316	7,613	13,623	6,551	8,902	32,264	22,122	15,089	16,412	19,529	40,383	42,668
Oats	8,204	6,035	3,539	2,250	3,738	1,930	1,588	2,891	3,126	2,127	3,224	1,745	1,889	2,043	2,450	2,608	2,125
Corn	10,583	8,617	3,837	4,416	3,621	3,099	2,769	2,095	4,659	7,444	6,260	4,337	3,892	6,101	7,550	9,841	14,773
Mohair	6,099	9,191	7,047	5,097	2,786	1,305	4,219	2,573	4,547	6,724	7,039	5,094	6,779	9,679	10,053	12,083	12,264
Wool	11,953	15,402	13,370	9,685	8,361	4,995	16,151	13,264	13,190	18,195	24,046	15,392	17,289	22,988	29,872	33,640	33,824
Grain Sorg.	9,823	7,489	3,749	6,482	2,038	1,367	2,181	2,765	2,219	4,391	4,914	3,388	4,659	6,044	7,798	9,335	16,875
Cattle	101,602	120,239	106,986	75,198	45,422	29,163	26,616	44,257	50,733	53,641	88,321	82,068	88,662	78,779	90,102	160,191	180,784
Calves	14,928	24,054	22,735	19,726	12,463	9,430	8,507	8,375	11,267	11,208	16,913	17,636	22,680	21,581	24,776	38,192	41,058
Hogs	7,391	7,979	9,819	7,778	3,606	2,214	4,223	2,888	4,670	10,950	11,561	10,137	9,246	7,642	14,428	28,317	48,107
Sheep	6,868	8,275	9,356	4,633	5,359	4,528	5,146	5,763	5,985	6,591	14,858	11,130	10,999	12,232	12,568	20,393	20,235
Poultry	15,892	16,424	18,913	17,749	15,181	10,131	8,472	9,614	11,917	10,786	12,735	11,743	10,640	10,490	10,836	13,238	17,692
Eggs	23,439	26,397	28,894	24,146	17,501	13,341	12,229	19,290	20,985	25,272	22,707	22,792	21,690	23,219	44,923	68,331	71,235
Rice	6,633	7,746	7,392	6,533	6,341	4,239	5,688	5,774	7,001	7,160	8,899	9,511	9,308	12,028	16,924	24,544	27,746
Milk Products	22,707	23,487	27,659	30,230	25,038	19,496	21,901	23,502	29,205	33,787	33,561	34,359	32,544	37,473	48,002	76,715	99,271
Fruits Veg.	16,683	22,070	26,037	26,962	18,714	21,865	12,867	13,181	13,754	17,579	30,434	25,672	26,379	22,232	25,191	42,300	85,805
Canning	.....	.....	.....	.....	.....	.....	.....	.....	193	566	764	974	783	869	855	2,208	3,831
Peanuts	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	22,969	29,401
TOTAL	807,996	849,546	737,475	514,776	356,855	295,516	366,843	362,877	388,539	449,871	579,235	442,304	432,144	462,392	634,628	931,711	1,087,217

Essentials of the Natural Regions of Texas

The concept of natural regions is basic to an understanding of the regional economy of the major sections of the United States. In like manner the regional economy of the Gulf Southwest is essential not only to an understanding of the economic development of Texas but to an appreciation of its possibilities in the next 25 years as well.

Geographic Orientation of Texas

Texas comprises a sizable portion of the United States, and although mere size is always an element to be given consideration in evaluating any extent of territory the size of Texas, emphasis should rather be given the fact that the determining environmental features of the State are associated directly with the geographic orientation of Texas—the place Texas occupies in the makeup of the North American continent. Not only are the present features of Texas to be so considered but also the dominant traits exemplified in the various stages that characterize the geologic evolution of the continent. This is to say, the numerous natural features of the State, features that are of determining importance in interpreting the occupation of the State by man, have, on the one hand, to be considered genetically if they are to be understood as factors basic to the utilization of the State's natural resources; and on the other hand, these features have to be placed in a comparative setting if they are to be viewed in full perspective.

Within an area the size of Texas considerable variety is to be expected. In general, the wide sweep of this variety is exemplified by the several larger sub-divisions of the State, the names of which are in common usage. These regions, each as large as ordinary states, include the Edwards Plateau, the High Plains, East Texas, South Texas, Trans-Pecos Texas, the Red Bed Plains, and so on.

Bases for Differentiating Natural Regions

Space will not be taken here to define the term, Natural Region. The natural region is not necessarily a topographic region although the topography and the physiography are usually very important elements in natural regions. Natural regions are delineated and interpreted on the basis of physical geography which as a separate and distinctive science has largely evolved since 1900. Whatever my own studies of regions and natural resources may contribute is due largely to the fact of my good fortune of having had the rare opportunities to have studied and worked intimately with those masters whose researches helped greatly in establishing science of Physical Geography. These were the men who helped lay the foundations of modern studies of natural resources. Perhaps for the sake of completeness, physical geography should not be confused in any manner with what is currently being called geomorphology.

Bases for the differentiation of natural regions include the following:

A. A world perspective of the major regions of the earth leads inevitably to the conclusion that the climatic factors are the primary ones to be considered in the study of natural regions; the importance of the climatic factor in this regard is strengthened by close parallelisms in the characteristics of the natural vegetation and the soils. The significance of these parallelisms has become widely recognized by scientists in their respective fields particularly during the past three or four decades.

B. Given the continents as they are now, the geologic factors, including topography, are to be considered as secondary in delineating natural regions save where the topography may be strong enough to determine the climatic factors which are predominant in a region, or where the geologic materials factor may be sufficiently strong over a large area of country as to counteract the influences of the main climatic factors.

C. The peculiar value of the concept of natural ergions lies, however, in the fact of the interplay and interaction of climatic factors and geologic conditions in a definite land area. These interactions as seen, for instance, in the evolution of natural vegetation and soils (which themselves are mutually interdependent) as well as in the characteristics of water supplies and in the essential attributes and geographic distribution of mineral resources, are basic concepts of physical geography.

Local subdivisions of the major natural regions are, however, based primarily upon consideration of a geologic and topographic nature. It is important to note that geologic and topographic features may transgress the climatic boundaries of natural regions, thereby carrying local features across from one natural region into another; this fact, if properly understood, need cause little confusion in the use of the concept of natural regions.

Larger Subdivisions of Texas

Although the various natural regions of Texas, such as the Edwards Plateau, the High Plains, the Central Denuded Region are each as large as ordinary states, yet before considering them individually, it is desirable to point out some of the comparative features of the larger subdivisions of the State—that is, of the larger divisions in which these natural regions of Texas are integral parts.

I. Humid East Texas, all of which is in the Coastal Plain, and which is mostly forested, is made up of three larger divisions—the three more or less parallel belts of country or major divisions which characterize the Gulf Coastal Plain as a whole.

Humid East Texas represents the prolongation well into Texas of the climatic environment characteristic of the Gulf Timber Belt. Having a humid climate, its soils are leached, and, because of the factor of parallelism applied to plant habitat areas, its natural vegetation consists of forest trees.

Humid East Texas lies wholly in the Coastal Plain but no correlations between climate and geology exist so far as boundaries are concerned. As a matter of fact, the climatic conditions transgress geologic and topographic features at the south where the climate becomes less humid, even semi-arid in the Brasada country along the Rio Grande; and at the north, humid conditions extend continuously from the Coastal Plain onto the lands underlain by Paleozoics.

II. The Sub-humid Plains comprise the middle section of Texas from Red River southward to the Rio Grande and the Gulf of Mexico. In width, this vast sub-humid belt in Texas ranges from the moderately humid Prairie lands at the east to the semi-arid lands at the west.

This sector of Texas is a prolongation southward of the sub-humid environment of the Great Plains—but the Texas phase of this vast continental climatic province is peculiarly characteristic of Texas.

The sub-humid plains of Texas comprise the short grass savanna country; it is dominantly composed of plains of various kinds, geologically considered. All of these several plains, however, possess certain common aspects of natural vegetation as well as of soils, and these common features are characteristic of this entire territory.

The short grass savanna province, however, does not have a sameness of vegetation throughout its extent; instead its vegetative cover varies from region to region, and within each region there occur local variations. These variations are always within certain rather well-defined limits. The point of emphasis here, however, is that certain important vegetational aspects are common to the natural vegetation at large throughout the area.

This sector of the State is the most characteristically Texan of all sections of Texas. East Texas is a prolongation of the Gulf Timber Belt; the Texas Prairies present no sharp soil differences from those of the Mid-West Prairies; and Trans-Pecos Texas is a portion of the Southwest Border Country. In brief, the short grass savanna section of Texas presents both surface and sub-surface features which are uniquely characteristic of Texas.

This portion of Texas lies in the zones of the Black Earth (or Chernosem) and of the Brown Grassland soils.

Because of its location in the southern portion of this soils zone, this middle Texas section is often referred to as the Southern Black Earth or Southern Chernosem country.

III. The Texas Prairies occupy undulating plains lying between the East Texas timbered plains and the Sub-humid short grass savanna plains. Their boundaries are somewhat irregular but typical Prairie lands are characterized by heavy-textured, dark-colored to black soils which originally supported a heavy growth of tall grasses.

Climatically, the Prairies occupy a transitional region. Lying westward and southward of the East Texas Forested Plains, the rainfall of the Prairies regions is less in amount and somewhat more variable in occurrence than is the case in the Gulf Timber Belt. Being transitional in their location, rainfall of the Prairies ranges from sub-humid to humid. For practical purposes, however, the Prairies may be described as moderately humid.

The Texas Prairies together with those of southeastern Oklahoma and southwestern Arkansas may be designated as the Southern Prairies.

The Southern Prairies, the outstanding representatives of which are the Black and Grand Prairies of Texas, are in many respects the southern counterpart of the Mid-West Prairies of the Upper Mississippi Valley. Their conditions of origin however, are different in many regards, and as to sub-surface characteristics they are entirely different.

The eastern boundary of the Black Prairies is approximately that of the great fault displacements that have provided the means of oil accumulation of the so-called fault-line oil fields, which include Mexia, Powell, Richland, and Currie.

In a large sense the origin of the Prairies is to be looked for in the operation of certain edaphic factors; that is, dominantly the factors of origin are edaphic; the main factors in their origin are geologic rather than climatic.

The unique position of the Prairies in American agriculture is partly due to the inherent characteristics of the Prairie soils and to the climatic environment of the regions in which they occur; in part, however, this uniqueness is due to the fact that Prairie soils occur in large amounts only in the North American continent. Argentina has an area of Prairie soils, but the total extent of Prairie soils in that country is probably less than a third of the area of Iowa.

IV. Trans-Pecos Texas adds considerable variety to a State that nowhere is overburdened by a monotony of physical features. Texas as a whole, outside the Trans-Pecos, is made up of a series of plains landscapes, each plains area or belt being separated from adjacent ones by more or less distinctive escarpments; many of these escarpments are striking to the eye and often separate two quite contrasted types of country.

The Trans-Pecos, however, is different. That portion of the Trans-Pecos west of the Stockton Plateau and the Toyah Basin is dominated by a series of mountain ranges between which are down-dropped and now filled-in intervening basins, all of which have a general northwest-southeast directional trend.

In fact, the Trans-Pecos portion of Texas may be described as a block of country characterized by major northwest-southeast trends, which lies between the Pecos and the Rio Grande.

The structural elements of Trans-Pecos Texas continue southeastward across the Big Bend country into Mexico, and northwestward they extend into New Mexico. More precisely, the Trans-Pecos front ranges—in-

cluding the Carmen Mountains and the Guadalupes—are extensions beyond the Rio Grande and across the Trans-Pecos region of the trends of the Eastern Sierra Madre of Mexico. The intervening lowland areas west of and more or less paralleling the Front Ranges likewise are prolongations into the Trans-Pecos of the Chihuahuan desert of the Mesa Central of Mexico.

The Trans-Pecos more than any part of South Texas is typically a portion of the Southwest Border Zone, the latter being a rather distinct belt of country which transgresses the continent and is characteristic of northern Mexico but which extends across the International Boundary line into the United States. The Southwest Border Zone includes southern California, the southern lowland areas of Arizona and New Mexico, much of Trans-Pecos Texas, and continuing further eastward in somewhat modified form, it embraces the chaparral country of South Texas.

The dominant features of the Southwest Border Zone are determined by the climate; in fact, it is often referred to as the Southwestern Desert. As a matter of fact, it includes two major desert regions—the Chihuahuan Desert, and the Sonoran Desert. Furthermore, the Southwest Border Zone is truly sub-tropical.

These two desert regions, the Chihuahuan and the Sonoran, although they have many features in common, and both of which may be designated as cactus deserts, are nevertheless rather different individually. And both of these desert regions in turn are quite different from the Great Basin, which erroneously is not always differentiated from the other two.

East Texas

In considering Texas regions, it is necessary to keep in mind not only the elements expressed in the surface features of the area concerned but also the sub-surface conditions as well; these elements, furthermore, are to be considered not as so many separate facts, but as parts of an interrelated whole. Not only must the larger comparative relations be clear in mind, but also the relationships between surface features and sub-surface conditions have to be given careful consideration.

East Texas includes the humid portion of the Gulf Coastal Plains which extends westward in Texas from Louisiana and southwestern Arkansas. East Texas comprises also the westward prologation of the Gulf Timber Belt in Texas.

Because it is a humid territory, East Texas is predominantly a timbered region and for the same reasons, it is characterized by leached soils. East Texas is the only large and continuous forested region in the State. Numerous woodland areas occur elsewhere but seldom can such areas be regarded as forests.

While most of the area is forested, small, interstream Prairie flats occur in the Coastal Prairies near the coast at the south; also, at the north, small "island-like" Prairies are found in a strip just south of Red River where the Black Prairies are almost pinched out in northeast Texas. The true Prairie areas, here as elsewhere, have dark-colored to black soils. All other soils of East Texas, outside the alluvial lowlands, are light colored, ranging from reds and yellows to gray and dark grays.

Topographically, East Texas has a pattern of relief analogous to that of the entire Coastal Plains; that is, it is a belted country. All of Texas, it may be noted again, is a belted country; in considering details of these topographic expressions in Texas, the basic concept is the sequence of distinctive belts of country as they occur across the entire State. From the standpoint of differences in relief, East Texas consists of three major divisions of belts, each more or less parallel to the present Gulf Coast; each of these belts can be further subdivided in numerous ways. In addition to these major belts of country which lie approximately parallel to the Gulf Coast, the entire Coastal Plains country is transgressed by streams flowing Gulfward; the larger of these streams have cut broad valley lowlands in the soft, unconsolidated Coastal Plains materials. It may be noted that river lowlands, wherever found, possess natural characteristics which are in contrast to the regional environments in which they occur.

The major topographic divisions of East Texas consist of:

a) The Coastal Belt which is low in altitude, flat to slightly undulating and of a slight relief, lies just back from the coast; it is underlain by geologically younger formations, all of which are post-Eocene in age. This belt includes the slightly submerged coastal marshes, the "islands" of Coastal Prairies, the mixed loblolly-hardwoods forests, and interiorward, with the slightly rising elevation, and therefore a deeper water table, it includes the longleaf country.

b) The Interior Belt, which is an Inner Lowland, lies at the north. It is underlain by the strip of Cretaceous outcrops; it also has island-like inclusions of Prairie areas. This belt includes the Sulphur River lowland. By and large this Inner Lowland is underlain by outcrops of the Gulf or Upper Cretaceous.

c) Lying between these two is the Central Dissected Belt, which in East Texas is complex both as to its topographic pattern and its sub-surface geology. These outcropping areas, forming physiographic belts, are surface expressions of the geologic column or section. The Central Dissected Belt is underlain by Eocene formations, consisting of alternating beds of clays and sands in couplet arrangement. Such a condition obviously represents a cyclic condition in deposition of these sediments. This is a thoroughly dissected belt and the major share of its area is covered with a mixed shortleaf-hardwoods forest. The physiography of this Central Dissected Belt has not been fully worked out. Apparently, however, the area had been reduced to a peneplaned region in the Mid-Tertiary. Subsequent uplift rejuvenated erosional activities, and as a consequence the present relief has been sculptured into the Mid-Tertiary elevated peneplaned surface. One aspect of this erosion consists of the remnants of a former upland, now existing as flat-topped hills capped, or at least margined, by resistant layers of lateritic iron ores. There can be little doubt that these lateritic iron ores (which are secondary deposits) are associated genetically with the ground-water conditions that obtained when this belt of country possessed a peneplaned surface.

At the western margin of East Texas is a flattish strip of country underlain by the Wilcox clays; this is a post-oak woodland, a prolongation into the Southwest from the oak-hickory forests of the Mississippi Valley. This area lies definitely beyond the reach of the Gulf Timber Belt. That is, for reasons of climate or soils, or perhaps of both in combination, this post-oak belt is westward of the pines which are typical of East Texas at large.

Geologically considered, East Texas consist of a series of formations, mostly unconsolidated, the general dip of which is Gulfward.

The oldest known formations are the Lower Cretaceous or Commanchean beds which overlap on the Paleozoics of southeastern Oklahoma (the Ouachita Mountains) to the north.

Although it does not outcrop anywhere in the Coastal Plain, the Jurassic is known to occur beneath the buried Lower Cretaceous beds in southwestern Arkansas and northwest Louisiana; whether or not the Jurassic extends under the Cretaceous in the Texas portion of the Coastal Plain remains to be determined.

Eocene outcrops of varying characteristics cover the Central Belt of East Texas; beneath the Eocene beds of this portion of the Coastal Plain are Upper Cretaceous strata which occur at somewhat moderate depths.

The Upper Cretaceous beds are very important in oil production in East Texas; one member is the Woodbine sand which is the productive formation at Van as well as in the gigantic East Texas field.

The Gulfward dip of the Coastal Plains formations is interrupted by several factors, some of regional extent, such as the Sabine Uplift together with its complementary structural feature, the East Texas or Tyler Trough or syncline, as well as by certain local factors such as the peculiar salt dome structures. The several formations of the Eocene may not be lithologically similar throughout their extent, owing to the influence of the dominant factors concerned with and which varied considerably during the deposition of these beds. In some cases at least formations which on outcrop are continental in character grade down dip into marine sands and these in turn may merge into clays and "shale" beds. Then there are cases of buried strata which have no outcropping elements, and which, when important for oil, are delineated by methods or microscopic paleontology through studies of diagnostic foraminifera. As a matter of fact, this phase of subsurface analysis was first applied on a large scale in sub-surface studies of the Gulf Coast country, studies which began in the middle 1920's.

The common salt domes are of the piercement type; the salt plugs in these may come entirely to the surface, and as a rule, they come within a short distance of the surface. Aside from the piercement salt domes formed by plugs of salt upthrust from a considerable depth through the various beds of strata, it is believed that another local type of structure is brought about by the existence of deeply buried salt domes. The existence of these domes is very important to the localization of oil and gas accumulations in the Coastal Plain and of salt and sulphur deposits as well.

The historic Spindletop oil field is a piercement-type dome; the Van structure is supposedly a deeply buried dome in the interior salt dome area and the Conroe structure is presumably a deeply buried dome in the Coastal Belt.

Also, there are two main salt-dome areas of the piercement type in the Coastal Plain—the interior one in the East Texas syncline; the other one, the Coastal Belt, extends from a tier or so of counties south of Houston eastward to the Mississippi delta.

There are other structures also: there are the faults, the great ones including a prolongation of the Balcones system, and numerous smaller ones; there are the buried features which make the so-called "trends," such, for instance, as the Wilcox trend along the Coastal Plain, the directional trend of which are approximately parallel to the present coastline. In addition, the presence of unconformities and the associated stratigraphic traps so vastly important in certain oil accumulations are known in the East Texas region. To deal with these in outline and to point out some of the more obvious relations of these buried geologic conditions to oil and gas accumulations would extend the limits of this article far beyond reasonable bounds.

A similar situation prevails as to the treatment, in an article like this, of surface features, or the characteristics of the various outcropping formations, the natural vegetation, the soils, water supplies, or of industries based on the utilization of these natural resources.

Without a fuller comprehension of the physical geography of regions as well as their comparative relations, together with a knowledge of the geographic geology of sub-surface structures, and the associated natural resources in their genetic relationships as well as in their comparative relations, and the relations of all of these to the essentials of the regional economy built upon man's utilization of these material endowments, we shall be floundering about as regards the full sweep of Texas potentialities or of individual problems such as those we shall be called upon to meet in the post-war years.

These statements apply also to the other Texas regions as treated in this brief article. Space limits allow little more than mention of the basic considerations together with very brief statements as to the all-important relationships to human occupation and economic development.

The Texas Prairies

The Black and Grand Prairies may be considered as typical of the Texas Prairies, and moreover the Black and Grand Prairies form the largest continuous areas of these natural types of landscape in the State. The Coastal Prairies are also readily recognizable, although differing in many respects from the Black and Grand Prairies. Occupying a central strip in the Central Dissected Belt of the Coastal Plain are the Brenham-Schulenburg-Yorktown Prairies, which are also readily recognizable and which are different still from the other two groups of Prairies in the State.

As is the case of the short grass savanna, certain determining characteristics are common to all Prairies; individual Prairie areas, as would be expected, present variations, but within the limitations of the larger grouping.

The Black and Grand Prairies have developed on outcropping beds of the Cretaceous. The Black Prairies occupy a sector of the Inner Lowland of the Gulf Coastal Plain, which is developed on the Upper or Gulf Cretaceous strata. This Inner Lowland is traceable as a distinct and important physiographic feature from the vicinity of Little Rock, Arkansas, southwestward to the Red River portion of northeastern Texas, thence westward to the vicinity of Denison where it bends southward, continuing via Dallas, Waco, Austin, San Antonio, and then westward via Uvalde and in somewhat more modified form it extends as far as Del Rio.

For obvious reasons, this Inner Lowland Belt has been and is highly important to lines of transportation. Early trails followed sections of this Inner Lowland as do modern highways and railroads.

The Grand Prairies occupy a strip in Texas west of the Black Prairies and north of the Brazos River; they have developed on Lower Cretaceous or Comanchean strata which are composed of more resistant limestone beds alternating with marly clays, all of which in north-central Texas dip eastward beneath the Gulf Cretaceous strata.

Lying between the Black and Grand Prairies is a strip of wooded country designated as the Eastern Cross Timbers. This strip is on the outcropping beds of the Woodbine sand—a geologic formation which plays a varied and important role in the geology of the State and the economic life of Texas as well. The Woodbine sand, like all other Upper Cretaceous strata, has a general dip Gulfward; that is, in north-central Texas these strata dip in a general southeastward direction.

The outcropping edges of the Woodbine sands form a strip of dissected country which has none of the Prairie characteristics that occur in such distinct form on either side of the Eastern Cross Timbers. The Eastern Cross Timbers is a thoroughly dissected area; its soils are sandy and light colored in contrast with the dark to black soils on either side; the natural vegetation is a woodland of hardwoods, particularly of black jack and post oaks.

These outcropping edges constitute an important moisture intake area and for some distance east of its outcrops the Woodbine sand is an important aquifer.

The Woodbine sand dips underneath the East Texas basin and rises on the western flank of the Sabine Uplift. The Woodbine is the oil reservoir sand in the East Texas field and it has furnished by far the greater production at Van and of the fault-line fields of Mexia, Powell, Richland, etc.

The Coastal Prairies are developed most typically on the Beaumont clays, a Pleistocene formation laid down during one of the phases of the Ice Age. The Lissie formation, lying just interior from the Beaumont clays, has a tall grass vegetation but the soils are not dark. Not only are they light colored but as a rule these soils on the Lissie formation are underlain by a strongly developed clay pan. In many ways these light-colored tall grassland soils are analogous to the so-called Gray Prairie soils which occupy much of the area of southern Illinois.

The Brenham-Schulenburg-Yorktown Prairies occupy outcrops of calcareous formations of the upper Tertiary. On either side of these Prairies are rather broad belts of woodland.

The outstanding characteristic of Prairie areas are the dark-colored to black soils, all of which are fine grained in composition, and therefore designated as heavy in texture. This is but another way of saying that Prairie soils have a high clay content. Typical Prairies occupy an undulating to slightly rolling surface and the Texas Prairies as well as those of the Mid-West were formerly characterized by a thick stand of vigorously growing *tall* grasses.

The economic importance of the Texas Prairies is exemplified particularly in their agricultural production, which, of course, is based upon the soil resources, the surface features, and the climate of these regions. Another manifestation of their importance is reflected in the proportion of Texas cities which occur in the Prairie regions, and the commercial importance of these regions is shown by the patterns of highways and railroad lines which are also characteristic features of the various Texas Prairie regions.

The reasons for the dominantly fine-grained nature of the Prairie soils are obvious to those who are familiar with the composition of the parent geologic materials and the remnants left by the weathering of such materials in case the rocks are consolidated.

We are not clear on all the details in the degradation of Prairie soils to the very light-colored, clay-pan soils now growing tall grasses, but the larger pattern is rather obvious to students of the subject.

Then there is the matter of the agricultural utilization of the Prairie soils of Texas, for these are soils of high agricultural capacity, and the Prairie regions are outstanding agricultural producing districts not only in Texas agriculture but also in the national picture at large.

In brief, the agriculture of the Texas Prairie regions, like that of other agricultural regions, is a matter of *ecological equivalents* especially as regards the major crops grown.

The point of emphasis here is, first that in order to appreciate the agriculture, either as to quantity or variety of production, of the prominent agricultural regions whether of the world, or of the United States, or of Texas, it is necessary to understand the scientific relations between that agriculture and the great soil groups in which it occurs; and secondly, when these relations are clearly in mind, it becomes quite obvious that the major agricultural regions correspond to, that is, their agricultural patterns vary with the character of the Great Soil Groups, whether considered from a world, national, or state point of view. This is to say that, in the present stages of agricultural development, the pattern of agriculture in the world's regions cannot be fully understood or appreciated without a thorough

knowledge of its direct relationships to the Great Soil Groups of the world.

Such a conception lifts the interpretation of agriculture from what is commonly conceded to be a routine, fact-embellished, statistically-studded, common-place sort of study onto a scientific level which calls for the best that modern science has to offer in order that the larger aspects of the picture may be presented. Only from such a point of vantage can a world perspective be readily gained, and at the same time the great regional shifts in the agriculture of the past can be appreciated for the important part they have played in the course of world economic development.

Potentially, the Texas Prairies regions possess the possibilities for that phase of world agriculture which is termed Mixed Farming. It is, of course, impossible here to present the physical background requisities for the development of Mixed Farming or to analyze the rise and spread of this technique of production, or even to mention the many and significant economic, industrial, and social implications with which this technique of production has been and is closely associated.

The Central Denuded Region

Lying between the cap-rock escarpment of the eastern edge of the High Plains and the westward-facing Goodland escarpment at the western edge of the Grand Prairies are the wide expanses of the greatly varied Central Denuded Region. This designation was first applied to the region by the late Robert T. Hill in 1886.

Southward the Central Denuded Region reaches to the Edwards Plateau and northward it extends across the western half of Oklahoma and terminates as a distinct region in south-central Kansas.

In Texas the Central Denuded Region is characterized by outcrops of four or five main groups of geologic formations. These include the following, from east to west:

a) The Comanchean Cretaceous at the east, embracing the Trinity sands lowlands (a portion of the Western Cross Timbers) and the Lampasas Cut Plains country. The latter is a rather deeply dissected area which in many ways represents a prolongation of the Edwards Plateau in modified form north of the Colorado River. The type of dissection, the kinds of remnantal areas, the stage in topographic development all combine to give to the Lampasas Cut Plain a landscape quite different indeed from that of any other portion of Texas.

b) The Pennsylvanian belts which are underlain by resistant, indurated conglomerate, sandstones and limestones.

c) The various belts of the Permian, such as the Clear Fork beds which accupy a central position in the larger region, with the Wichita-Albany beds to the east and the Double Mountain beds (or the Gypsum plains) to the west.

d) The smaller Triassic belt, which in part is also mantled by continental deposits.

The main portion of the Central Denuded Region, which is underlain by the Permian, is predominantly a Red Beds country. In fact, the Permian outcrops together with the irregularly bounded strip of the Triassic which lies just in front of the cap-rock escarpment of the High Plains form a regional unit which is aptly designated the Red Beds Plains.

East of the Permian occur the outcrops of the Pennsylvania. Both the Pennsylvania and Permian strata dip westward into the great Permian Basin and beneath the High Plains; both groups of strata reappear in New Mexico, where they have been uplifted by mountain-making movements in front of the Western Cordilleran ranges.

Still further east, between the Pennsylvanian outcrops and the Goodland escarpment is an irregular area underlain by the Trinity sands of the Lower Cretaceous or Comanchean series. The Trinity sands form what is termed an overlap on the Pennslyvanian.

The outcrop areas of the Pennsylvanian and the Trinity sands form what can be designated as the Western Cross Timbers. This area in north-central Texas comprises two different types of geologic sections, one type of which is oil bearing, the other one without oil.

The overlap of the Trinity sands, which form a portion of the Western Cross Timbers, covers an unproductive gap in the Texas map of oil fields; this particular area is underlain in part by the Buried Ouachitas together with the westward sloping beds of the Buried Ouachitas structure.

The oil-bearing sections include two districts: the north-south fields aligned on the so-called Bend Arch (a buried structure extending from the Llano district northward nearly to Red River), and the Buried Hills of the Red River Uplift, another buried structure of east-west trend, which parallels the axes of the Wichita-Arbuckle mountains and the Buried Amarillo Mountains. The fundamental notion regarding the Buried Hills type of structure is that they are mountainous monadnocks rising far above the "level" of the pre-Cambrian peneplane.

The Paleozoic sedimentary beds laid down adjacent to these "Hills" have suffered differential compaction as a result of the greater weight of the thicker sediments, and as a consequence the dip of the beds has become accentuated over that of the original dip of deposition.

Physiographically, the Central Denuded Region is unique. Thick sections of strata formerly extending over this large region have been eroded away apparently since a regional uplift in the Pliocene. Erosion and dissection and landscape sculpturing have resulted in the reduction of relief into and below the great peneplane that had been developed apparently by the end of the Oligocene.

Remnantal areas, great sentinels of the landscape, the flat tops of which stand well above the present level of the country are found in a scattered distribution throughout the extent of the Central Denuded Region. These eminences are usually flat-topped, being capped by resistant layers of Comanchean limestone; among these remnants of a former plane and which also served as great landmarks in an earlier stage of Texas history are such well-known ones as Comanche Peak, Double Mountain, Round Mountain, Santa Anna Mountain, the Callahan Divide Upland, and Flat Top Mountain, to mention the better known ones.

Nor is the present "level" of the Central Denuded Region without considerable variety, topographically

and otherwise. Although Texas has been aptly described as a belted country, consisting of the succession of the great topographic belts, reinforced by aligments of the relief-forming features, the almost multitudinous escarpments which border the plain belts, it is not to be assumed that these are mere superficial features.

The key to a fuller understanding of the characteristics, for instance, of the Coastal Plains lies in a thorough comprehension of the belted features expressed in the surface features of these plains and reinforced by studies of the actual sub-surface conditions.

In an analogous manner, the key to an understanding of the Central Denuded Region lies in a comprehensive interpretation of its relief features plus the subsurface studies made possible by the scientifific examination of rock materials provided from drilling operations.

Moreover, each major belt of outcropping beds in the Central Denuded Region is characterized by its own type of relief as well as by its own individual sorts of soil materials, out of which mature soils may, or may not have evolved.

Other than the overlapping Trinity sands at the eastern margin, as has been stated, the successively outcropping layers of the Pennsylvanian, Permian, and Triassic dip westward into the Permian basin and extend beneath the High Plains. In other words, the outcropping edges of these numerous strata comprise the eastern limb of what is termed the Permian geosyncline, the axis of which has a north-south direction and the central portion of which is overlain by the High Plains formations.

The general "level" of the surface of the Central Denuded Region lies below that of the High Plains surface, just as it also lies below the numerous and widely scattered erosional remnants, the flat tops of which capped by Comanchean limestones, mark a former surface of the region, but which has been reduced and sculptured by the Great Denudation to its present conditions. Stated in another way, the Central Denuded Region has been reduced physiographically considerably below the level of the uplifted peneplane which had been formed apparently by the close of the Oligocene; in contrast, the High Plains remain as a vast, uneroded remnant which has pretty well preserved the surface of this peneplane, and it has, in addition, the blanketing formations which have subsequently been laid down on this planed-off surface.

In brief, the Central Denuded Region is a belted country; outcrops of major geologic formations form the major belts of topography. But each main belt of country, with the exception of the Clear Fork group of the Permian, is characterized by a number of subordinate belts, each separated from the other by east-facing escarpments.

In detail, physiographic dissection has given to the Central Denuded Region as a whole what has been aptly designated as a stairstep pattern of relief—a succession of plains belts in various stages of dissection and reduction, separated by escarpments of stratification. The elements in this topographic pattern provide the key to an appreciation of the relief as it is related to stabilized physiographic areas, that is, the constructional areas, on the one hand, and the physiographically unstabilized areas which are, of course, the erosional areas. This differentiation is a fundamental one as regards the utilization of these lands. The constructional areas, if large enough in extent, can be used for farming. Some of these are continuous over rather large areas, as is the case of the Clear Fork formations of the Permian; in other cases, they are only small island-like areas, which are now in farms and entirely surrounded by range lands. The actively erosional areas can, of course, best be used for grazing purposes. The relation of the physical conditions to the preservation of the natural vegetation, its susceptibility to *ecologic retrogression*, and therefore the importance of these factors to the grazing and range livestock industry should be quite obvious.

Summarizing, the elements of this pattern of relief, especially well exemplified in the Red Beds Plains, embrace the following factors and conditions:

a) The outcropping geologic materials consist of a succession of strata which comprise resistant rock layers that alternate with thicker sections of non-resistant unconsolidated beds;

b) The strata are tilted; they dip westward, progressively underneath the next younger formation;

c) The elevation gradually rises westward.

Under these conditions, the relief forming elements, the outcropping ends of consolidated rock layers, whether of sandstone, limestone, dolomitic limestone, or gypsum, under the influence of physiographic reduction, have given the rather sharp east-facing excarpments, which with the continuous reduction are progressively working westward. These harder, resistant layers of consolidated rocks, are separated by clay beds. A particular escarpment-forming consolidated rock layer dips beneath the overlying clay bed; the latter, when exposed by physiographic reduction, is developed into a dip plain of greater or less width. This clay bed dips beneath the next escarpment, with a repetition of the topographic elements just described. Going westward across this country, one rises gradually step by step across these escarpments until the High Plains region is reached. A wider application of this concept is that in crossing Texas from the low Coastal Belt to the western mountains, one successively crosses definite belts of plains country of varying width; in the Coastal Plains, however, the escarpments are interior facing ones in contrast to those of the Central Denuded Region which face eastward.

In more technical language each of these elements constitute a cuesta, which consists of two topographic components—a sharper-faced escarpment and the longer, more gradual inclined "back-slope," developed on the dip plain. The general "level" of the Central Denuded Region is made up of a succession of cuestas, all with sharper east-facing escarpments. The back-slope feature of these cuestas invariably inclines westward, dipping beneath the next escarpment; the physiographically stable belts of the Central Denuded Region occur on this back slope. These back slopes differ in width and the surface features vary within a considerable range. All the farming areas of the region are on these back-slopes.

Still another physiographic feature associated with the topographic conditions in the Red Beds Plains is the

stream pattern. Moreover, this is a region in which "sand" rivers are distinctively developed.

The susceptibility to erosion of the friable materials of the Red Beds Plains is well exemplified in the "red rises" occasioned by heavy rains and the consequent over-burdening of streams with these sediments.

In addition, the different belts of country of the Central Denuded Region present varying conditions as to sub-surface water supplies. All of these are items that can only be mentioned in this article.

The High Plains

Topographically, the High Plains of west Texas and eastern New Mexico are high plains—a large, quadrangular, relatively smooth surfaced area which rises above the Central Denuded Region at the east and its physiographic analogue, the Pecos Lowland at the west —both of which are physiographically reduced areas, having been lowered in altitude and sculptured into innumerable relief forms in the period that C. E. Dutton long ago termed the Great Denudation.

Structurally, however, this whole area is a syncline and the High Plains region overlies the belt of greatest depth of the Permian Basin.

From whatever angle it is viewed, the High Plains country, which at first glance may seem to be the most monotonous appearing large region of Texas, is one of the most complex, interesting ,and entrancing to be found anywhere. This is so whether as regards the various stages in its complex geologic history, from the Cambrian deposition laid down on the pre-Cambrian peneplane to the latest blanket of dust deposited on its apparently monotonous surface, and including, of course, the various types of deposits laid down on the Platform of the Plains during periods of Late Tertiary continental sedimentation; or of such things as its structural deformations, the evolution of the so-called buried West Texas Platform, the peculiar phases of Permian deposition in the shifting Permian seas—which includes the formation of the so-called reef limestones, chemical precipitation of a variety of evaporites in desiccating seas, blanket deposits of continental Red Beds, and so on; or of the more recent things, such as the present-day surface features and the genetic factors concerned in their development, the former drainageways that extended across the High Plains, the underground water supplies, the various types of natural vegetation, the evolution of the Chernosem soils, as well as many other items which space forbids even the mention of.

Most of the High Plains and all of the Central Denuded Regions lies within the Black Earth or Chernosem Zone of soils. As a matter of fact, these two Texas regions possess the large share of arable soils of the Southern Black Earth or Southern Chernosem section.

Chernosem or Black Earth soils, occurring in subhumid climates, are non-leached soils. The physical conditions of typical Black Earth soils are excellently adapted to plant growth for well-known reasons that cannot even be noted here for lack of space; likewise these soils are rich chemically in those elements required for plant growth. It is a peculiar fact that the basic reason for the intense richness, both physically and chemically, of Black Earth soils is also the limiting factor in plant and crop growth in these regions; this factor is the reduced rainfall, as compared with the amount of rainfall in humid regions.

Furthermore, these two regions, the High Plains and the Central Denuded Region, together comprise an important as well as one of the most distinctive agricultural regions in the United States. Again, in explanation of this situation, the concept of ecologic equivalents needs to be applied in order to interpret both the scientific and economic aspects of this agricultural area. In addition to its agriculture, these two regions are also important for their production of range livestock.

The agricultural conquest of these sub-himid plains, which did not begin in Texas until the 1870's, constitutes an important segment in what is now regarded by the students of the situation as the greatest agricultural revolution of modern times. Any discussion of the comparative aspects of this development will have to be left to a later article.

The point of emphasis is, of course, the necessity for a dynamic interpretation of these vital phenomena in their comparative relations. The need is for a broad perspective at once substantial and distinctive and intelligible by means of which the comparative and genetic features of the problems can be brought together into a coördinated whole.

From the standpoint of oil and gas the West Texas fields together with those of the Texas Panhandle constitute one of the great oil districts of the nation.

A map of the West Texas or Permian Basin fields shows what may at first appear as peculiar patterns of alignment. In brief these alignments follow certain lineaments of the "Central Basin Platform" or the West Texas Platform as well as the margins of the Permian Basin, in which, of course, the West Texas Platform occurs. Concerning the latter, a U. S. G. S. statement summarizes as follows: "A major structural feature in the west Texas district is a buried uplifted platform of Paleozoic rocks, having a width of 30 miles or more and extending northwestward from Crockett County into New Mexico, a distance of more than 200 miles. This uplift is known as the Central Basin Platform. West of this uplift is a structural basin 75 miles wide, the Delaware Basin, in which the rocks lie much lower than rocks of corresponding age in the Central Basin uplift; east of the uplift is another basin, the main Permian [Midland] basin, 60 to 75 miles wide, in which the rocks lie some 2,000 feet lower than on the uplift. . . . The east and west flanks of the Central Basin Platform are steep, suggesting major faulting."

Most of the oil production in West Texas to date is from the Permian but current knowledge of the subsurface geology of the Permian Basin, in spite of the immense amount of work that has been done upon it during the past decade or so, is by no means as complete as is to be desired. From beneath the Permian in this region important production has been obtained in the Early Paleozoics, particularly from the Ordovician and the Ellenburger of Cambro-Ordovician age.

How much oil these Early Paleozoics may ultimately produce is of course a puzzle which won't be solved until considerable more exploratory drilling has been done.

From the standpoint of oil and gas the Panhandle is different still. The Panhandle gas field, some 125 miles in length, and of a fair width in proportion to its length, is, like the gigantic East Texas oil field, in a class entirely by itself. It may be that further drilling will reveal that the Panhandle gas field is connected with the great Hugoton gas field in southwest Kansas.

Along the northern border of the Panhandle gas field is the Panhandle oil field; this oil field as yet hasn't been proved to be a continuous one. It is, however, one of the sizable oil fields of the nation.

By way of summary, the Permian Basin and the Panhandle together constitute one of the great oil reserves of the United States; the wider potentialities of the Panhandle gas reserves have by no means been given the consideration these reserves merit from the standpoint either the potentialities to Texas of natural gas as an industrial fuel or as a raw material for a new and potentially tremendously important synthetic organic chemicals industry.

The Edwards Plateau

The Edwards Plateau is sometimes described as a great slab of limestone—which it is not. In the main, the surface of the Edwards Plateau comprises a plane which bevels across several limestone formations of the Comanchean series; this plane is the surface of a great mesa-like land form, the margins of which have been frayed and dissected by the action of erosional agencies.

In general, this plane which caps the Edwards Plateau extends beneath the varied unconsolidated materials which blanket the High Plains. Hill called this feature the Platform of the Plains, it being the peneplane that had been developed by the close of the Oligocene.

Like the High Plains and the Central Denuded Region as well, the Edwards Plateau is a portion of the Great Plains province of North America. The Edwards Plateau, with certain exceptions, has none of the blanketing unconsolidated deposits which are so strikingly characteristic of the High Plains. Whether or not the Edwards Plateau was formerly covered over with these unconsolidated materials, and which subsequently have been eroded away, need not concern us here. The fact is that throughout the extent of the Edwards Plateau region, the soils as a rule are thin and over a large proportion of the area, rock exposures are readily in evidence at the surface.

The eastern margin of the Edwards Plateau is the escarpment of the Balcones fault system—an escarpment now eroded and dissected and considerably reduced; from the vicinity of San Antonio the escarpment continues in modified form westward to Del Rio.

The Balcones Escarpment was so named by R. T. Hill in 1889 and its true geologic aspects were worked out by Hill about the same time. Along this escarpment the Coastal Plain meets with the southern extremity of the Great Plains, but from this line of junction, these two great land features extend in divergent directions so as to include between them much of interior North America: the Coastal Plain, extending along the Gulf and thence skirting the Atlantic Coast to Cape Cod (beyond which it is submerged beneath the border of the Atlantic), the Great Plains continuing northward far into the Arctic zone in Canada.

The Llano district.—In the northeast corner of the Edwards Plateau is an area quite different indeed from any other portion of Texas. This is the Llano district—an area from which the sedimentary layers of the Comanchean Cretaceous and of the Early Paleozoics have been stripped away, exposing the old pre-Cambrian igneous and metamorphic rocks which comprise a wide range of materials, such as granite, gneiss, schist, and quartzite. On the flanks of the Llano Uplift and adjacent to the pre-Cambrian exposures are Early Paleozoics which dip radially away from the central section of the region. These Paleozoics dip beneath the surrounding Comanchean limestones, which in general surround the Llano district and whose infacing escarpments form an upland below which the Llano country, threaded by the Colorado and Llano rivers, forms an irregularly shaped basin, the floor of which has a considerably diversified surface.

In many respects the Llano district belongs in the Central Denuded Region; the Llano area, however, has been unroofed down to the Early Paleozoics and even to the pre-Cambrian; the surfaces developed on the exposures of these rocks are indeed different from those of any other section of Texas.

Taken as a whole the Edwards Plateau is a grazing country—and a very important one it is, too—which means, of course, that its primary natural resource is its natural vegetation—the grasses and browse plants which support its herds of cattle and its flocks of sheep and goats.

There is some farming in the region but farming occurs only in certain exceptional areas where deeper soils occur and in those areas it is largely, although not entirely, devoted to the growing of feedstuffs.

The natural vegetation of the Edwards Plateau is varied, reflecting in part the physical environmental differences and contrasts that are manifested in the various parts of the region, and in addition the extension into the United States of plants from the Mexican Plateau country. This region lies in the short-grass savanna sector of Texas; but the natural vegetation in certain areas may depart widely from the conditions of the typical short-grass savanna landscape. These varying facies of the natural vegetation are associated with the occurrence of differing local environments exhibited in the region, and, in addition, the vegetation in these exceptional areas has been greatly modified by man's occupation of them, and especially by the practice of overgrazing.

In the Llano district, for instance, grasses are absent over considerable areas—and this is something exceptional to Texas; the vegetative floor, however, consists of herbaceous plants, including legumes. Along the frayed margins of the Balcones Escarpment from north of the Colorado to the vicinity of Uvalde occurs an

irregularly shaped district aptly designated as the cedar brakes. In brief, this now rather dense cedar vegetation is characteristic of the thin-soiled erosional slopes on the Glen Rose beds which in this area comprise alternating members of marly clays and limestones.

Prior to white man's occupation of the Edwards Plateau, this region like most other sections of Texas, was more or less regularly burned over by the Indians. These huge grass fires served to kill out much of the woody types of vegetation.

Since white man's occupation, the big fires have been greatly reduced or stopped entirely; and with the occupation of the lands for grazing, a large portion of them have been subjected to overgrazing. Overgrazing naturally makes for the killing out of the desirable types of vegetation whose place is taken by less desirable or even obnoxious or poisonous types—in brief it results in what is aptly termed ecologic retrogression.

Ecologic retrogression, associated with overgrazing and in combination with the reduction of grass fires since the occupation of these lands by the white man, has been a very important factor in modifying the vegetation of the entire area of the sub-humid plains of Texas; this modification is especially marked in the Edwards Plateau and in the chaparral areas of South Texas.

South Texas

South Texas is the southern portion of the Coastal Plains of Texas and like the Coastal Plains in general it is characterized by three rather distinctive belts which are quite obvious in this region. These belts of country comprise the Coastal Prairies Belt, the Inner Lowland or Interior Belt, and in between these, the wide and considerably diversified Central Dissected Belt.

Interiorward and lying next the Balcones Escarpment is an Inner Lowland, largely developed on Upper Cretaceous beds but which is also characterized by rather widespread continental deposits of limy materials derived from the physiographic reduction of the Edwards Plateau.

The low and flattish Coastal Belt, although fairly distinct as a physiographic belt, is also considerably modified to the southward by a blanket cover of wind deposited materials of different textures, and at the southern extremity of the Coastal Belt in Texas the deltaic and associated features of the Rio Grande stand out in a prominent maner.

The Central Dissected Belt, lying between these two, widens considerably along the Mexican border owing to the influence of the Rio Grande Embayment; this Central Belt is a variegated one, being made up of subsidiary belts of country extending approximately parallel to the main belts of the Coastal Plain. It includes, for instance, the so-called Caliche Plateau, the eastern edge of which merges into the low and flattish Coastal Belt; the western edge of the Caliche Plateau is a strikingly developed inland-facing escarpment which overlooks a lowland plain, one of the subsidiary belts of the Central Dissected Belt.

Most of the area of South Texas is a grazing country, but several very important farming areas occur. The Inner Lowland Belt from Austin to San Antonio and thence westward to Uvalde is characterized by the presence of Chernosem or Black Earth soils. Likewise the dark-colored clayey soils of the Central Belt are Black Earth or Chernosem. There are, in fact, two subdivisions of Black Earth soils in the Coastal Belt—one in the Corpus Christi-Robstown district, the other in the upland portion of the Lower Rio Grande Valley. Between these two districts of Black Earth soils is a large area covered with windblown sands, part of it rather deeply. The deep sands area is characterized by a scattered growth of live oaks and it may have moving sand dunes.

The less deep sand areas, or areas where the sands are mixed with silts, are characterized by a mesquite savanna type of vegetation, the vegetative cover roughly paralleling the proportion of sand and its depth in the soil. Farther south, the sands area grades into the silty upland plain with its Black Earth soils, which forms a continuous area of citrus and vegetables production in the Lower Rio Grande Valley. The lowlands portion of the Lower Rio Grande consists of the remnants of the anastomosing pattern left by the Rio Grande as it has migrated back and forth across the river lowland. Sections of the former channel remains as arroyos or resacas; remnants of natural levees occur in a scattered distribution throughout the lowland (these natural levee areas, combining favorable surface drainage with soils of good texture are excellent farm lands, but usually are of limited extent); and in addition to these, are the lower, flat-lying intervening areas usually composed of clays; if well enough drained, these low lands produce good crops of such plants as are adapted to heavy textured soils.

The agricultural value of the rich soils of the Lower Rio Grande Valley is largely dependent upon irrigation. Other irrigated areas in South Texas comprise the Winter Garden district together with lowland areas along the Rio Grande below Del Rio, as in the vicinities of Laredo and Eagle Pass.

South Texas is an important region in oil and gas production; the development of its oil and gas resources, however, has proceeded rather quietly, and as a consequence, has not achieved the public recognition its importance obviously merits.

The southern fault-line fields of Luling, Darst Creek, and Salt Flat, together with the Somerset shallow production district lie near the western limits of South Texas. These are older fields in South Texas, Luling having been discovered in 1922.

The rest of South Texas oil and gas production can be grouped into two main divisions: the Laredo and Corpus Christi districts.

To the end of 1942 the Laredo district had produced a total of 250 million barrels of oil; the comparable figure for the Corpus Christi district was 400 million barrels. These cumulatives may be contrasted with the cumulative of the Houston or Upper Gulf Coast district which was nearly 1,500 million barrels.

The Corpus Christi district is especially important in natural gas production and is particularly noted for its recycling operations.

The entire Gulf Coast country is certainly one of the big oil and gas reserves of the United States. What still deeper drilling will reveal throughout the Gulf Coast is, of course, eagerly awaited by both the oil and gas industries.

The Trans-Pecos

Trans-Pecos Texas is different in practically all respects from the rest of Texas. Geologically, it is characterized by tremendous faulting, to which vast outpourings of volcanic rocks are added. The results of faulting and tilting, of volcanic outpourings of igneous materials, and the subsequent modifications by erosion give to the Trans-Pecos of Texas a diversified relief, together with eminences that show remarkable climatic and vegetative zonation. All combined, these natural features make the Trans-Pecos one of the most unique of North American regions.

Faulted, uplifted and tilted fault blocks, together with the Davis Mountains volcanic materials, form the main ranges; the parallel trending, intervening down-faulted lowland units have been subjected to considerable filling-in with detrital materials derived from the adjacent highlands, except along the Rio Grande where the finer materials have been carried long distances. The surfaces of these lowlands in some cases are smooth; in other cases have been greatly modified by erosion, resulting in dissection and in some cases the formation of terraces, many of which are of striking appearance. In other cases, volcanic materials have been pushed up from beneath, giving rise to striking geologic and physiographic expressions, as is the case, for instance, of the Chisos Mountains, which occur in a great graben lying between two opposite-facing major escarpments in the Big Bend country.

Geologically as well as climatically Trans-Pecos Texas belongs to the Southwest Border Zone—a transverse belt of country which extends westward to the Pacific.

The natural vegetation of the Trans-Pecos varies with moisture conditions; its distribution is exemplified in a vertical zonation pattern as outlined in the October, 1943, issue of the Texas Business Review.

The Trans-Pecos district, like the entire Southwest Border Zone, is primarily a grazing country. Much of the area has a low carrying capacity, owing to the reduced rainfall and its variable occurrence. On the other hand, certain areas of considerable size, as in the Davis Mountains, and in some of the plains are excellent grazing lands.

The problem of water supply is a critical one in the Trans-Pecos. Springs occur scatteringly; some are of very large size, and all of them are landmarks. The Pecos and the Rio Grande extend through the Southwest Border Country as great canals, rather than as characteristic streamways. Most of the streams originating in the Trans-Pecos are "suicidal" in type, even including the flooded arroyos which extend out on the lowlands following heavy rains.

Other than some local irrigation projects, as in the Balmorhea district, the agriculture of Trans-Pecos Texas is in the irrigated portion of the Rio Grande lowland which extends southeastward from El Paso. A complementary lowland area devoted to irrigation agriculture lies north of El Paso in New Mexico. Irrigation water for both of these areas is supplied from the Elephant Butte reservoir on the Rio Grande in New Mexico.

Resumé

Perhaps something of the magnitude of the natural diversity of Texas has become more apparent from a consideration of the foregoing discussion of Texas regions. The discussion, however, is but an outline and consequently many significant features are entirely omitted and others are only mentioned.

The geologic history of Texas during the Tertiary, basic to an understanding of Texas physiography, could not be considered as a whole. The concept of the Regional Coastward Slope of the Mid-Tertiary and in which the present relief of the State was carved by erosion during the later Tertiary and Pleistocene is not even mentioned as such.

Also, it may be hoped that, in addition to suggesting the tremendous amount of diversity the State possesses, the outlines dealing with the several natural regions of the State as contained in this article may add to an appreciation of the comparative position these regions occupy among the larger natural divisions of the North American continent.

It has also been impossible to point out certain large and important aspects of geologic deposition in the various periods which are of great concern to students of the geology of oil and natural gas. Deposition, where it occurred, in the Early Plaeozoic period, was of the normal marine type but in Late Paleozoic time, as exemplified in the Pennslyvanian and Permian, a great change in deposition began to the evident. There are marked contrasts, too, as regards folding and faulting to which the Early Paleozoic beds were subjected and the lesser amount of widespread folding Late Paleozoic time. Likewise there are the contrasts in deposition between Early Mesozoic and the Late Mesozoic (Cretaceous), together with the gradational aspects evident in Jurassic time.

The primary objective of an analysis of Texas by the use of the natural regions concept is to present the fundamental features of these natural divisions as habitat areas, primarily, of course, in relation to human occupation. The essential idea is, that with a perspective of earth conditions and the associated natural resources, it is possible to interpret more completely the reactions of those major geographic shifts in agriculture and basic manufacturing industries as they have migrated into Texas, together with the characteristics these phases of economic development have displayed in the various sections of the State.

With such analyses as a background, studies much more comprehensive than it is possible to show or suggest in this article, will make possible a fuller consideration in a substantial and concrete manner of the agricultural and industrial problems of the State which inevitably will demand a solution in the future.

Elmer H. Johnson.

Greater Mechanization Essential to the Cotton Industry

The tremendous importance of the cotton industry to the economy and social order of the large cotton growing region, and through it the whole United States, makes imperative an aggressive policy for solving its problems. The trouble is the loss of markets. Many causes have contributed to this loss, but the predominant one is the comparatively high costs of both raw cotton production and manufacture. The major reason for the high costs of production are due to continued use of hand labor in both production and harvest in a country where other production, even in agriculture, has been mechanized.

Cotton manufacturing was one of the very first of the major industries to be mechanized as a vital part of the Industrial Revolution in the middle of the 18th Century. The trouble with the industry now is that it has not kept pace with other industries in discovering and adopting labor saving devices such as is characterized by the use of automatic machines in assembly line or continuous production and in eliminating or shortening processes.

The foregoing facts raise three fundamental questions. Is the cotton industry worth saving, and, if so, how can it be done, and how would the economy of the South be affected?

There are four major crops in the United States States around which our agricultural economy and a large share of our commerce and manufacturing are built—corn, wheat, cotton, and hay. As industrialization proceeds and population increases, relative values of crops will be determined more and more by their capacity to yield values in terms of industrial raw materials, food and feed. Because cotton yields such a wide range of these, especially textiles, chemicals, foods, and feeds, it is preeminent among our major crops.

Analyses of United States Census data show that employment of about 4,500,000 people in the United States is attributable to cotton and its multitude of products.

Cotton production is climatically oriented in the long hot summer zones where our other major crops are not well adapted and have not been able to compete successfully with it. A large percentage of the cultivable land area of the United States is in this zone, and the distinctive production of this region is a vital factor in balancing the economy of the nation.

Cotton's capacity to produce value per acre is far ahead of the other major crops. Figures published by the United States Department of Agriculture show that the average farm value of wheat produced per acre during the five years ending 1940 was $11.54, corn, $20.46, cotton, $28.35, and hay $11.45.

Surely an industry which plays such a vital and distinctive role in the nation's economy, and has such great variety and capacity to produce, is worth saving.

How can it be done? According to the Department of Agriculture, the average cost per acre of producing wheat in the United States in 1940, the last year for which data are available, was $10.00, not including rent, corn $14.83, and cotton $20.29, data are not available for hay.

The major difference in the per acre cost of producing cotton, corn and wheat lies in two items—cultivation and hoeing and in harvesting. In the case of corn, these two items total $5.49, in wheat only $0.90, and in cotton $12.10.

If cotton growers could reduce costs on these two items to the corn level through mechanization, the cost of producing cotton would be reduced to $13.68 per acre, and cotton would become the most attractive major crop in the nation. Abundant evidence that these costs can be reduced is already available.

According to studies made by Bonnen of the Texas Agricultural Experiment Station, costs of producing cotton on the high plains of Texas with four row tractor drawn equipment was only $6.41 per acre in 1934, not including land charge and taxes; and fifty per cent of this was charged against hoeing and harvesting. The average yield was 180 pounds of lint per acre. Obviously the mechanization of these last two processes will make costs of cotton production in favorable areas very low.

Notable advances toward mechanization of these two burdensome hand processes in cotton production are being made. If reports are true, the leaf menace to mechanical harvesting is in the way of being eliminated by American Cyanamid Company's discovery of a cheap, quick means for defoilating the plant for harvest purposes.

Recently a farmer adapted his wheat combine to the harvesting of cotton. Sleds and strippers for harvesting cotton are being improved. In addition to all this, the breeding of cotton with upright plants, short branches and rapid fruiting habits combined with defoliation and improved cleaning equipment at the gin, and many other developments all point unquestionably to complete, cheap mechanization of cotton production.

Complete mechanization of cotton production will affect the economy of the South profoundly. Areas adapted to machine methods will prosper; other areas may eventually be forced out of the cotton business. Substantial shifts in population will probably occur, and fewer cotton farmers will be needed. On the other hand, through it the industry can be saved with prospects of increasing markets, production and overall employment.

Any cotton policy which has the unfortunate effect of continuing cotton production in high cost producing areas and of preventing the attainment of maximum economies of mechanization in favorable areas will inevitably result in the gradual loss of the industry through the slow, deadening process of attrition resulting from loss of markets due to high costs. High costs here protected by above market price loans will keep us out of foreign markets and will pave the way for synthetic fibers to cut deeper and deeper into the domestic market.

What I am trying to say is that the South and the nation cannot dodge the cotton problem or put it off much longer with soothing subsidies. The cotton problem demands immediately bold, constructive, comprehensive thinking and planning in both its agricultural and manufacturing aspects.

The emergency lies in coming to a clear understanding of potentialities and objectives for the cotton industry and in formulating constructive policies to reach those objectives.

Mechanization of production is not the end objective —it is only one means to the end of saving a great industry to increase employment at higher returns.

Mechanization will not come all at once for many varying factors and differing conditions over the belt will prevent that; but it is vital and urgent that our national cotton policy encourage rather than hinder this transition from hand labor to machine production, and that we formulate coördinate programs of research to adjust our whole economy, and especially the agricultural aspects of it, to meet the changing situation.

History shows clearly that in the long run mechanization creates more jobs than it destroys, for it increases production and production is a function of employment though not of the kind and often not in the place where the introduction of the machine displaced it. The adjustments to complete mechanized cotton production will be discussed later.

A. B. Cox.

COTTON BALANCE SHEET FOR THE U.S. AS OF JANUARY 1, 1944

(In Thousands of Running Bales Except as Noted)

Year	Carryover August 1	Imports to Jan 1*	Gov. Est. as of Jan. 1	Total	Cons. to Jan. 1	Exports to Jan. 1	Total	Balance Jan. 1
1934–1935	7,746	49	9,737	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	5,829	17,455
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	4,180	19,150
1941–1942	12,367	†	10,976	23,343	4,441	†	4,441	18,902
1942–1943	10,590	†	12,982	23,572	4,713	†	4,713	18,869
1943–1944	10,687	†	11,478	22,165	4,324	†	4,324	17,841

The cotton year begins August 1.
*Figures are in 500-pound bales.
†Not available.

PERCENTAGE CHANGES IN CONSUMPTION OF ELECTRIC POWER

	Dec., 1943 from Dec., 1942	Dec., 1943 from Nov., 1943
Commercial	+ 31.4	+ 2.7
Industrial	+ 44.5	− 1.5
Residential	+ 18.1	+ 10.7
All Others	+206.6	+ 2.0
TOTAL	+ 58.2	+ 0.5

Prepared from reports of 7 electric power companies to the Bureau of Business Research.

TEXAS COMMERCIAL FAILURES

	Dec., 1943	Dec., 1942	Nov., 1943
Number	0	1	0
Liabilities*	0	$24	0
Assets*	0	4	0
Average Liabilities per failure*	0	24	0

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

TEXAS CHARTERS

	Dec., 1943	Dec., 1942	Nov., 1943
Domestic Corporations:			
Capitalization*	$1,289	$52,721	$696
Number	50	32	57
Classification of new corporations:			
Banking-Finance	3	1	0
Manufacturing	6	3	6
Merchandising	13	5	16
Oil	1	6	3
Public Service	2	0	1
Real Estate Building	13	7	9
Transportation	3	3	1
All Others	9	7	21
Number capitalized at less than $5,000	29	6	17
Number capitalized at $100,000 or more	2	4	2
Foreign Corporations (Number)	20	14	15

*In thousands.
NOTE: Compiled from records of the Secretary of State.

EMPLOYMENT AND PAY ROLLS IN TEXAS

December, 1943

	Estimated Number of Workers Employed* Nov., 1943[1]	Dec., 1943[2]	Percentage Change from Nov., 1943	Dec., 1942	Estimated Amount of Weekly Pay Roll Nov., 1943[1]	Dec., 1943[2]	Percentage Change from Nov., 1943	Dec., 1942
MANUFACTURING								
All Manufacturing Industries	168,479	169,180	+ 0.4	+ 4.5	5,452,835	5,452,835	+ (3)	+ 21.9
Food Products								
Baking	8,640	8,882	+ 2.8	+ 14.9	265,493	275,865	+ 3.9	+ 28.2
Carbonated Beverages	3,831	3,666	— 4.3	+ 22.8	111,598	107,148	— 4.0	+ 29.4
Confectionery	1,621	1,707	+ 5.3	+ 30.4	21,573	22,713	+ 5.3	+ 28.2
Flour Milling	2,267	2,310	+ 1.9	+ 8.8	65,189	65,848	+ 1.0	+ 37.4
Ice Cream	1,273	1,242	— 2.4	+ 2.2	33,018	32,396	— 1.9	+ 12.1
Meat Packing	6,948	6,572	— 5.4	— 3.6	262,046	226,688	— 13.5	+ 13.3
Textiles								
Cotton Textile Mills	5,611	5,662	+ 0.9	— 17.3	129,873	126,393	— 2.7	— 8.8
Men's Work Clothing	4,227	4,241	+ 0.3	— 19.2	78,695	67,339	— 3.0	— 6.6
Forest Products								
Furniture	1,937	1,870	— 3.4	+ 17.4	48,140	46,640	— 3.1	+ 59.7
Planing Mills	2,073	2,095	+ 1.0	— 4.4	56,936	57,752	+ 1.4	— 3.1
Saw Mills	15,945	15,928	— 0.1	— 2.9	292,218	293,556	+ 0.5	+ 14.3
Paper Boxes	996	971	— 2.5	+ 15.0	23,716	24,379	+ 2.8	+ 34.3
Printing and Publishing								
Commercial Printing	2,375	2,541	+ 7.0	+ 7.3	79,055	86,994	+ 10.0	+ 22.6
Newspaper Publishing	4,033	4,082	+ 1.2	— 8.2	118,115	120,841	+ 2.3	+ 2.0
Chemical Products								
Cotton Oil Mills	4,108	4,216	+ 2.6	+ 0.3	70,434	71,035	+ 0.9	+ 19.8
Petroleum Refining	23,126	23,321	+ 0.8	+ 5.5	1,307,652	1,323,394	+ 1.2	+ 29.5
Stone and Clay Products								
Brick and Tile	1,546	1,730	+ 11.9	— 7.7	26,105	29,099	+ 11.5	— 6.7
Cement	1,067	1,058	— 0.9	— 15.4	39,627	39,548	— 0.2	— 12.4
Iron and Steel Products								
Structural and Ornamental Iron	2,666	2,762	+ 3.6	— 3.4	79,329	86,865	+ 9.5	+ 18.7
NONMANUFACTURING								
Crude Petroleum Production	25,848	26,136	+ 1.1	+ 2.1	1,369,505	1,380,757	+ 0.8	+ 30.1
Quarrying	(4)	(4)	— 2.8	— 15.5	(4)	(4)	— 3.5	— 5.8
Public Utilities	(4)	(4)	— 0.5	+ 4.8	(4)	(4)	— 6.0	+ 16.7
Retail Trade	245,749	272,045	+ 10.7	+ 5.7	5,701,213	6,230,368	+ 9.3	+ 24.1
Wholesale Trade	61,846	63,080	+ 2.0	— 2.3	2,302,771	2,328,632	+ 1.1	+ 4.8
Dyeing and Cleaning	2,813	2,745	— 2.4	+ 4.4	60,743	60,639	— 0.2	+ 21.2
Hotels	18,927	19,254	+ 1.7	+ 13.2	317,879	323,228	+ 1.7	+ 42.3
Power Laundries	13,587	14,093	+ 3.7	— 1.3	233,531	247,787	+ 6.1	+ 17.3

CHANGES IN EMPLOYMENT AND PAY ROLLS IN SELECTED CITIES[6]

	Employment Percentage Change Nov., 1943 to Dec., 1943	Dec., 1942 to Dec., 1943	Pay Rolls Percentage Change Nov., 1943 to Dec., 1943	Dec., 1942 to Dec., 1943
Abilene	— 1.2	+ 34.9	+ 2.9	+ 32.4
Amarillo	+ 1.8	— 14.3	+ 3.7	— 7.4
Austin	+ 5.4	— 4.7	+ 5.5	+ 4.6
Beaumont	+ 2.8	— 2.0	— 0.1	+ 13.5
Dallas	+ 3.5	+ 34.8	+ 4.0	+ 60.6
El Paso	+ 2.9	— 2.9	— 1.9	+ 15.7
Fort Worth	— 3.5	+ 77.4	— 5.2	+ 94.2
Galveston	+ 10.7	+ 3.6	+ 0.1	+ 52.1
Houston	— 1.4	+ 5.8	— 5.6	+ 10.4
Port Arthur	— 1.2	+ 3.6	— 0.4	+ 28.9
San Antonio	+ 3.3	+ 5.8	+ 0.2	+ 12.4
Sherman	— 2.1	+ 3.2	— 8.0	+ 13.7
Waco	+ 8.7	+ 5.5	+ 10.1	+ 2.0
Wichita Falls	— 1.1	— 14.9	— 6.8	+ 11.4
STATE	+ 0.7	+ 15.8	— 1.5	+ 31.5

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

	1941[1]	1942[1]	1943		1941[1]	1942[1]	1943
January	1,094,000	1,170,000	1,385,000[1]	July	1,156,000	1,317,000	1,450,000
February	1,120,000	1,199,000	1,397,000[1]	August	1,176,000	1,352,000	1,441,000[2]
March	1,120,000	1,226,000	1,415,000[1]	September	1,203,000	1,373,000	1,448,000[2]
April	1,114,000	1,222,000	1,433,000[1]	October	1,219,000	1,384,000	1,455,000[2]
May	1,120,000	1,251,000	1,458,000[1]	November	1,219,000	1,389,000	
June	1,134,000	1,291,000	1,478,000[1]	December	1,222,000	1,413,700	

*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] Less than 1/10 of 1 per cent.

[4] Not available.

[5] Based on unweighted figures.

[6] Not including self-employed persons, casual workers, or domestic servants, and exclusive of military and maritime personnel. These figures are furnished by the Bureau of Labor Statistics; U.S. Department of Labor.

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

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

POSTAL RECEIPTS

	Dec., 1943	Dec., 1942	Nov., 1943	Year 1943	Year 1942
Abilene	$ 61,784	$ 63,282	$ 39,500	$ 504,664	$ 393,294
Amarillo	76,489	74,765	53,382	631,345	479,149
Austin	116,003	130,510	82,261	1,062,149	1,001,942
Beaumont	63,031	58,195	45,043	514,780	415,415
Big Spring	16,388	14,675	8,912	120,287	96,023
Brownwood	43,210	38,178	22,788	307,929	213,050
Childress	10,010	7,090	7,004	62,532	44,609
Cleburne	7,790	6,590	5,143	41,941	47,665
Coleman	5,808	5,420	4,059	48,430	40,885
Corpus Christi	94,459	80,845	60,083	696,876	555,491
Corsicana	42,366	14,028	10,292	136,570	91,518
Dallas	5,746,272	622,451	504,883	10,859,732	5,091,473
Del Rio	9,199	6,937	5,548	70,252	45,886
Denison	16,201	14,999	9,348	114,264	96,870
Denton	14,155	13,124	10,667	119,108	107,433
Edinburg	5,750	4,696	3,787	45,719	38,388
El Paso	148,367	119,428	95,074	1,113,635	809,753
Fort Worth	292,117	285,000	258,519	2,555,899	2,196,206
Galveston	67,395	68,521	49,752	565,652	484,794
Gladewater	5,370	4,846	3,722	45,570	39,001
Graham	4,426	10,080	2,743	24,134	35,038
Harlingen	19,853	34,154	12,593	138,139	118,303
Houston	490,890	460,513	338,720	4,004,004	3,568,706
Jacksonville	6,252	5,798	4,039	110,435	47,608
Kenedy	7,988	2,499	2,064	32,590	24,993
Kerrville	6,146	5,430	3,402	45,232	39,283
Lubbock	45,208	43,500	32,544	373,249	313,716
Lufkin	8,958	8,896	7,335	78,246	71,143
McAllen	9,534	9,254	6,363	74,945	66,147
Marshall	14,636	15,667	9,193	113,784	108,575
Palestine	10,605	9,317	7,279	87,131	77,212
Pampa	15,930	13,882	8,955	117,593	93,556
Paris	30,096	22,647	19,369	234,817	119,321
Plainview	7,861	8,157	5,259	63,984	57,960
Port Arthur	42,554	36,283	25,703	300,994	232,087
San Angelo	32,101	30,459	19,837	236,732	196,315
San Antonio	360,008	333,959	249,149	2,907,310	2,242,660
San Benito	17,547	16,632	10,862	136,186	118,664
Sherman	3,077	3,086	2,104	25,539	20,930
Snyder	10,918	8,555	6,494	89,875	67,706
Sweetwater	24,095	19,973	14,924	154,334	118,478
Temple	39,202	31,704	22,109	291,475	278,752
Tyler	44,941	27,524	31,068	337,866	208,802
Waco	72,007	61,033	47,009	574,028	484,408
Wichita Falls	64,938	57,238	10,665	488,487	468,325
TOTAL	$ 8,231,875	$ 2,938,873	$ 2,191,840	$30,790,145	$21,593,516

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

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

	Cattle		Calves		Hogs		Sheep		Total	
	1943	1942	1943	1942	1943	1942	1943	1942	1943	1942
Total Interstate Plus Fort Worth	3,406	4,004	964	1,054	1,168	1,128	488	745	6,026	6,931
Total Intrastate Omitting Fort Worth	317	1,189	50	252	99	37	52	155	518	1,633
TOTAL SHIPMENTS	3,723	5,193	1,014	1,306	1,267	1,165	540	900	6,544	8,564

TEXAS CAR-LOT* SHIPMENTS OF LIVE STOCK FOR YEAR 1943

	Cattle		Calves		Hogs		Sheep		Total	
	1943	1942	1943	1942	1943	1942	1943	1942	1943	1942
Total Interstate Plus Fort Worth	62,903	61,357	11,715	13,985	16,402	11,947	13,316	12,840	104,336	100,129
Total Intrastate Omitting Fort Worth	8,180	9,934	1,921	1,955	830	350	1,378	1,849	12,309	14,088
TOTAL SHIPMENTS	71,083	71,291	13,636	15,940	17,232	12,297	14,694	14,689	116,645	114,217

*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.

BUILDING PERMITS

	Dec., 1943	Dec., 1942	Nov., 1943	Year 1943	Year 1942
Abilene	$ 7,192	$ 3,380	$ 27,045	$ 238,449	$ 1,180,028
Amarillo	11,730	43,795	8,580	566,409	965,507
Austin	93,014	33,748	33,698	439,957	1,587,223
Beaumont	15,616	30,985	73,613	2,085,370	3,621,220
Brownwood	1,680	49,350	2,160	24,243	392,355
Coleman	0	0	14,000	19,450	125,365
Corpus Christi	45,385	1,048,692	78,010	3,079,742	5,113,810
Corsicana	1,267	2,300	1,780	33,680	156,939
Dallas	576,164	277,172	966,624	5,534,869	6,561,617
Del Rio	3,130	2,800	43,381	138,202	76,415
Denton	1,510	150	1,300	28,845	50,513
El Paso	42,458	62,355	36,041	465,121	2,608,644
Edinburg	1,645	1,010	2,008	39,392	44,738
Fort Worth	204,295	775,545	561,875	6,508,870	11,018,898
Galveston	141,318	11,355	90,361	1,099,623	1,448,303
Gladewater	35	0	1,000	7,000	6,580
Graham	0	0	3,003	12,378	18,008
Harlingen	0	950	1,775	7,698	102,160
Houston	995,380	61,890	364,035	8,458,060	11,292,009
Jacksonville	2,080	500	250	14,955	13,950
Kenedy	75	0	300	5,740	2,990
Kerrville	506	725	1,865	58,409	32,150
Lubbock	37,825	7,862	25,071	270,731	2,068,875
McAllen	21,820	2,895	13,705	99,573	150,433
Marshall	7,959	3,784	6,578	343,294	201,517
Midland	8,225	0	700	45,769	283,161
New Braunfels	790	485	1,905	14,702	39,609
Palestine	950	125	9,180	36,774	39,161
Pampa	0	0	213,535	436,195	148,800
Paris	78,355	4,125	20,100	265,105	225,715
Plainview	350	0	3,650	42,455	10,465
Port Arthur	11,885	11,670	18,400	210,768	330,899
San Antonio	405,720	419,693	152,095	2,973,605	4,872,476
Sherman	9,408	4,031	9,520	132,088	343,284
Snyder	1,550	0	0	42,400	21,770
Texarkana	22,625	53,789	7,765	276,483	1,136,740
Tyler	12,822	9,074	11,597	128,657	218,473
Waco	56,240	66,300	66,300	785,788	1,350,877
Wichita Falls	82,300	2,539	10,665	280,524	643,546
TOTAL	$ 2,903,304	$ 3,051,115	$ 2,888,980	$35,251,373	$58,565,223

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

DECEMBER, 1943, CARLOAD MOVEMENTS OF POULTRY AND EGGS

Shipments from Texas Stations

*Destination	Cars of Poultry: Chickens, December 1943	Chickens, December 1942	Turkeys, December 1943	Turkeys, December 1942	Cars of Eggs: Shell, December 1943	Shell, December 1942	Frozen, December 1943	Frozen, December 1942	Dried, December 1943	Dried, December 1942	Shell Equivalent† December 1943	Shell Equivalent† December 1942
TOTAL	16	23	141	208	14	22	84	35	101	71	990	660
Intrastate	0	7	16	14	11	18	41	2	1	16	101	150
Interstate	16	16	125	194	3	4	43	33	100	55	889	510

Receipts at Texas Stations

TOTAL	4	14	5	2	63	38	35	6	11	7	221	106
Intrastate	1	11	4	0	8	8	19	1	0	7	46	66
Interstate	3	3	1	2	55	30	16	5	11	0	175	40

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

†Dried eggs and frozen eggs are converted to a shell egg equivalent on the following basis: 1 rail carload of dried eggs=3 carloads of shell eggs, and 1 carload of frozen eggs=2 carloads of shell eggs.

NOTE: These data furnished to the Division of Agricultural Statistics, B. A. E., by railroad officials through agents at all stations which originate and receive carload shipments of poultry and eggs. The data are compiled by the Bureau of Business Research.

DECEMBER RETAIL SALES OF INDEPENDENT STORES IN TEXAS

	Number of Establishments Reporting	Percentage Changes in Dollar Sales: Dec., 1943 from Dec., 1942	Dec., 1943 from Nov., 1943	Year 1943 from Year 1942
TOTAL TEXAS	925	+21.9	+30.0	+27.4
STORES GROUPED BY LINE OF GOODS CARRIED:				
APPAREL				
Family Clothing Stores	24	+16.4	+27.2	+43.9
Men's and Boys' Clothing Stores	35	+23.4	+42.7	+45.2
Shoe Stores	12	− 1.8	+11.9	+29.8
Women's Specialty Shops	31	+30.9	+32.9	+48.5
AUTOMOTIVE*				
Motor Vehicle Dealers	53	+10.3	− 3.0	+20.2
COUNTRY GENERAL	93	+15.4	+10.8	+20.7
DEPARTMENT STORES	57	+19.3	+32.2	+33.9
DRUG STORES	110	+18.7	+39.2	+24.6
DRY GOODS AND GENERAL MERCHANDISE	20	+15.6	+21.4	+49.0
FILLING STATIONS	29	+34.9	+ 1.9	+24.5
FLORISTS	19	+39.1	+80.3	+43.8
FOOD*				
Grocery Stores	30	+17.6	+13.2	+17.4
Grocery and Meat Stores	95	+21.9	+13.1	+20.3
FURNITURE AND HOUSEHOLD*				
Furniture Stores	56	−10.9	+16.4	+18.6
JEWELRY	26	+26.3	+101.8	+35.1
LUMBER, BUILDING, AND HARDWARE*				
Farm Implement Dealers	10	+25.0	− 5.4	− 5.5
Hardware Stores	54	+ 9.2	+ 6.4	− 1.4
Lumber and Building Material Dealers	98	+10.5	− 8.5	−13.7
RESTAURANTS	24	+23.5	− 2.2	+22.6
ALL OTHER STORES	8	+98.7	−15.7	+19.5
TEXAS STORES GROUPED ACCORDING TO POPULATION OF CITY:				
All Stores in Cities of—				
Over 100,000 Population	135	+20.6	+29.3	+30.3
50,000–100,000 Population	103	+14.2	+30.3	+21.5
2,500–50,000 Population	77	+55.1	+22.9	+27.6
Less than 2,500 Population	226	+22.3	+ 6.2	+15.5

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

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

DECEMBER CREDIT RATIOS IN TEXAS DEPARTMENT AND APPAREL STORES

(Expressed in Per Cent)

	Number of Stores Reporting	Ratio of Credit Sales to Net Sales: 1943	1942	Ratio of Collections to Outstandings: 1943	1942	Ratio of Credit Salaries to Credit Sales: 1943	1942
All Stores	50	42.4	48.7	66.0	63.7	0.9	0.9
Stores Grouped by Cities:							
Austin	5	36.9	43.9	76.5	76.2	0.8	0.9
Dallas	7	50.7	58.1	61.3	61.0	0.7	0.6
Fort Worth	4	37.6	45.5	75.3	69.1	1.1	1.2
Houston	5	40.4	48.0	64.0	59.4	1.2	1.2
San Antonio	4	36.7	39.0	69.0	64.7	1.1	1.2
Waco	3	41.9	48.4	61.8	58.4	0.8	0.8
All Others	22	38.1	43.8	72.3	69.5	0.7	0.8
Stores Grouped According to Type of Store:							
Department Stores (Annual Volume Over $500,000)	16	40.5	47.1	67.4	66.9	1.0	1.0
Department Stores (Annual Volume under $500,000)	8	39.2	42.4	71.9	64.6	0.9	0.9
Dry-Goods-Apparel Stores	3	36.1	43.5	62.3	66.2	1.2	1.2
Women's Specialty Shops	10	52.3	57.1	58.4	58.4	0.5	0.5
Men's Clothing Stores	13	39.2	47.2	75.9	60.0	0.9	0.9
Stores Grouped According to Volume of Net Sales During 1943:							
Over $2,5000,000	10	38.9	45.4	67.6	67.9	0.7	1.0
$2,500,000 down to $1,000,000	10	42.0	47.4	63.7	60.5	0.8	0.8
$1,000,000 down to $500,000	7	31.4	40.1	70.9	61.9	0.9	1.2
$500,000 down to $100,000	23	34.8	37.0	73.1	68.7	1.4	1.3
Less than $100,000							

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.

DECEMBER RETAIL SALES OF INDEPENDENT STORES IN TEXAS

(By Districts)

	No. of Establishments Reporting	Percentage Changes Dec., 1943 from Dec., 1942	Dec., 1943 from Nov., 1943	Year 1943 from Year 1942
TOTAL TEXAS	925	+18.7	+26.7	+27.2
TEXAS STORES GROUPED BY PRODUCING AREAS:				
District 1–N	67	+ 4.0	+14.3	+22.1
Amarillo	22	− 1.4	+19.6	+23.2
Pampa	12	+10.6	+ 8.2	+11.0
Plainview	13	+ 9.2	+32.5	+23.9
All Others	20	+ 8.6	− 2.6	+22.5
District 1–S	33	+44.2	+27.5	+42.2
Lubbock	20	+55.5	+22.0	+44.9
All Others	13	+27.6	+ 7.2	+36.8
District 2	73	+10.0	+16.5	+21.6
Abilene	14	+ 9.3	+24.5	+30.0
All Others	59	+ 9.9	+11.8	+18.8
District 3	33	+ 9.7	+15.8	+18.5
District 4	197	+15.7	+23.8	+43.1
Dallas	32	+23.6	− 0.7	+43.9
Fort Worth	16	+19.1	+32.1	+30.4
Sherman	10	+ 4.7	+16.8	+11.8
Temple	14	+ 1.4	+15.8	+10.5
Waco	18	+18.7	+40.8	+54.8
All Others	107	+12.9	+12.9	+24.4
District 5	97	+20.2	+26.4	+27.8
District 6	38	+14.8	+29.5	+23.4
El Paso	21	+14.7	+29.8	+23.3
All Others	17	+14.5	+28.9	+22.9
District 7	48	+12.5	+25.2	+20.2
San Angelo	12	+10.3	+25.7	+21.2
All Others	36	+13.8	+24.0	+18.5
District 8	149	+20.6	+32.1	+20.8
Austin	14	+15.6	+34.0	+15.2
San Antonio	42	+21.7	+36.1	+26.7
All Others	93	+23.5	+11.2	+19.7
District 9	106	+16.1	+25.8	+26.2
Houston	43	+16.2	+25.5	+27.6
All Others	63	+16.1	+26.4	+24.0
District 10	71	+24.5	+18.7	+38.1
District 10–A	44	+31.8	+14.9	+56.2

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

LUMBER

(In Board Feet)

	Dec., 1943	Dec., 1942	Nov., 1943
Southern Pine Mills:			
Average Weekly Production per unit	227,374	239,786	272,236
Average Weekly Shipments per unit	222,565	268,526	228,508
Average Unfilled Orders per unit, end of month	14,093,376	1,587,722	16,151,860

NOTE: From Southern Pine Association.

PETROLEUM

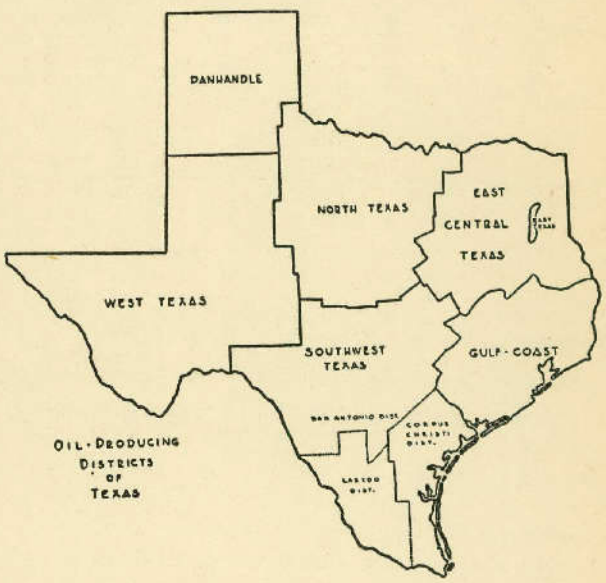
Daily Average Production (In Barrels)

	Dec., 1943	Dec., 1942	Nov., 1943
Coastal Texas*	520,650	312,900	524,600
East Central Texas	125,650	101,040	139,200
East Texas	365,600	347,780	376,400
North Texas	143,350	137,950	141,900
Panhandle	93,450	92,460	85,500
Southwest Texas	291,400	174,910	298,050
West Texas	355,050	208,510	359,750
STATE	1,895,150	1,384,550	1,925,400
UNITED STATES	4,371,850	3,871,640	4,413,450

Gasoline sales as indicated by taxes collected by the State Comptroller were: November, 1943, 103,031,954; November, 1942, 145,768,000; October, 1943, 102,641,255.

*Includes Conroe.

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



COMMODITY PRICES

	Dec., 1943	Dec., 1942	Nov., 1943
Wholesale Prices:			
U.S. Bureau of Labor Statistics (1926=100%)	103.2	101.0	102.9
Farm Prices:			
U.S. Bureau of Labor Statistics (1926=100%)	121.8*	113.8	121.4
Retail Prices:			
Food (U.S. Bureau of Labor Statistics (1935–1939=100%)	137.1	132.7	137.3
Department Stores (Fairchild's Publications January, 1931=100%)	113.1	113.1	113.1
Cost of Living Index, (1938–1939=100%)	124.4	120.4	†

*Preliminary.
†Not available.

DAIRY PRODUCTS MANUFACTURED IN PLANTS IN TEXAS

Product and Year	January	February	March	April	May	June	July	August	September	October	November	December	Total
CREAMERY BUTTER (1000 lb.)													
1943*	3,012	3,001	2,724	3,446	4,740	4,275	4,051	3,452	2,629	2,581	2,236	1,924	38,071
1942*	2,341	2,076	2,131	3,311	4,396	4,358	3,937	3,684	3,602	3,243	2,515	2,341	38,066
1930–39 average	2,074	2,109	2,392	3,138	3,556	3,166	4,113	2,867	2,513	2,608	2,301	2,211	32,048
ICE CREAM (1000 gal.)													
1943*	1,554	1,218	1,408	1,823‡	2,327‡	2,391‡	2,758‡	2,763‡	1,990‡	1,622‡	1,443‡	940	22,237
1942*	745	700	1,014	1,312	1,812	2,305	2,476	2,324	1,911	1,698	1,614	1,046	16,089
1930–39 average	1,215	1,262	434	570	752	893	904	846	686	460	259	205	6,486
AMERICAN CHEESE (1000 lb.)													
1943*	874	1,025	1,108	1,633	2,120	1,943	1,896	1,405	1,019	819	621	809	15,272
1942*	1,308	1,302	1,644	2,204	2,756	2,674	2,580	2,048	1,604	1,221	757	735	20,717
1930–39 average	554	590	737	1,050	1,215	1,129	1,119	1,025	866	852	718	641	10,496
MILK EQUIVALENT OF DAIRY PRODUCTS† (1000 lb.)													
1943*	98,377	90,422	88,540	115,788	154,491	142,700	143,120	124,558	93,186	85,084	73,290	62,253	1,271,809
1942*	75,435	77,913	83,621	105,047	148,707	145,064	145,868	131,841	119,279	104,273	83,502	72,806	1,237,136
1930–39 average	54,675	57,139	67,456	89,641	104,323	97,562	97,075	89,185	76,165	73,444	60,119	55,872	922,656

*Estimates of production made by the Bureau of Business Research.
†Mill Equivalent of Dairy products was calculated from production data by the Bureau of Business Research.
‡Includes ice cream, sherberts, ices, etc.
NOTE: 10-year average production on creamery butter, ice cream and American cheese based on data from the Agricultural Marketing Service, U.S.D.A.

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