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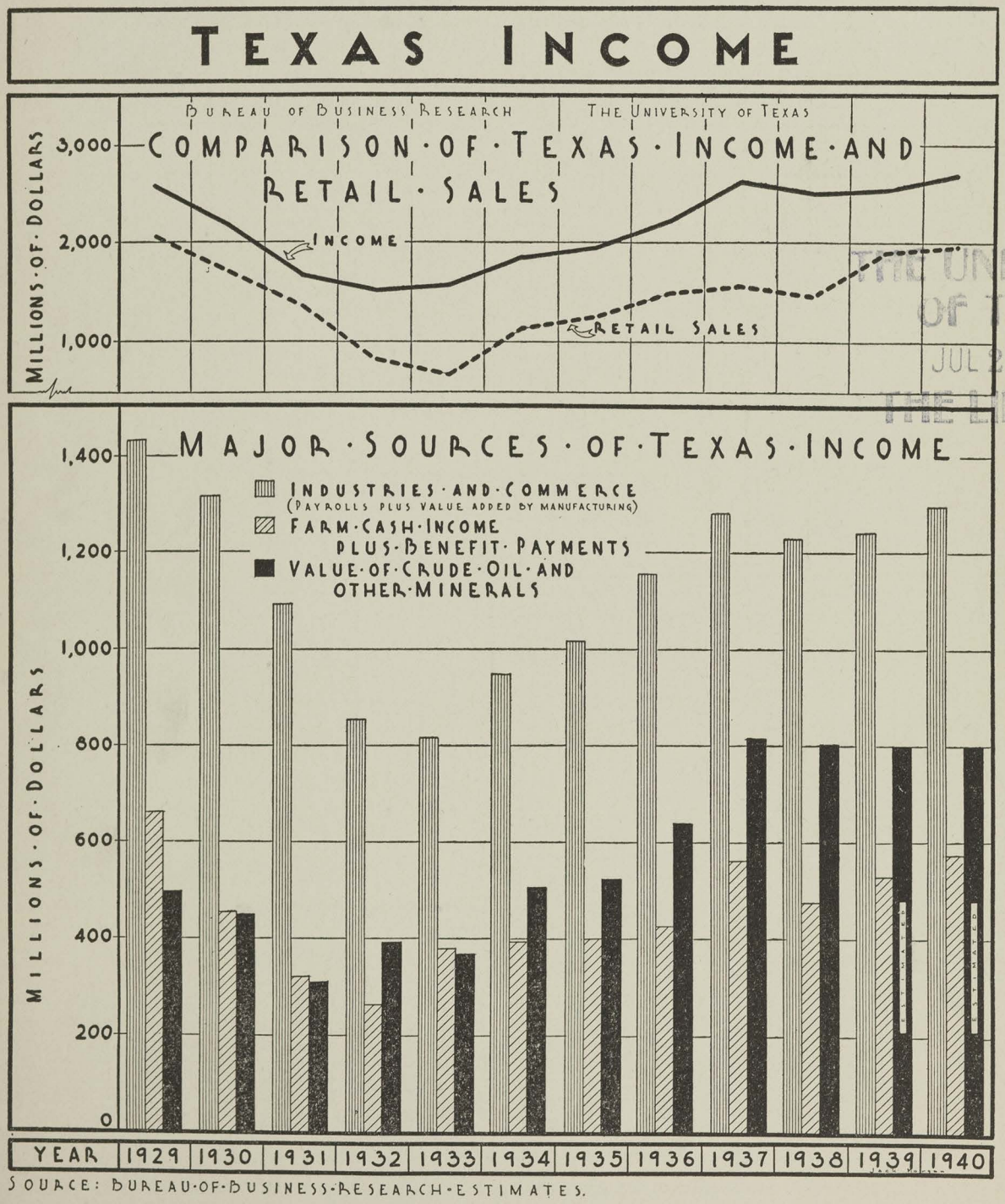

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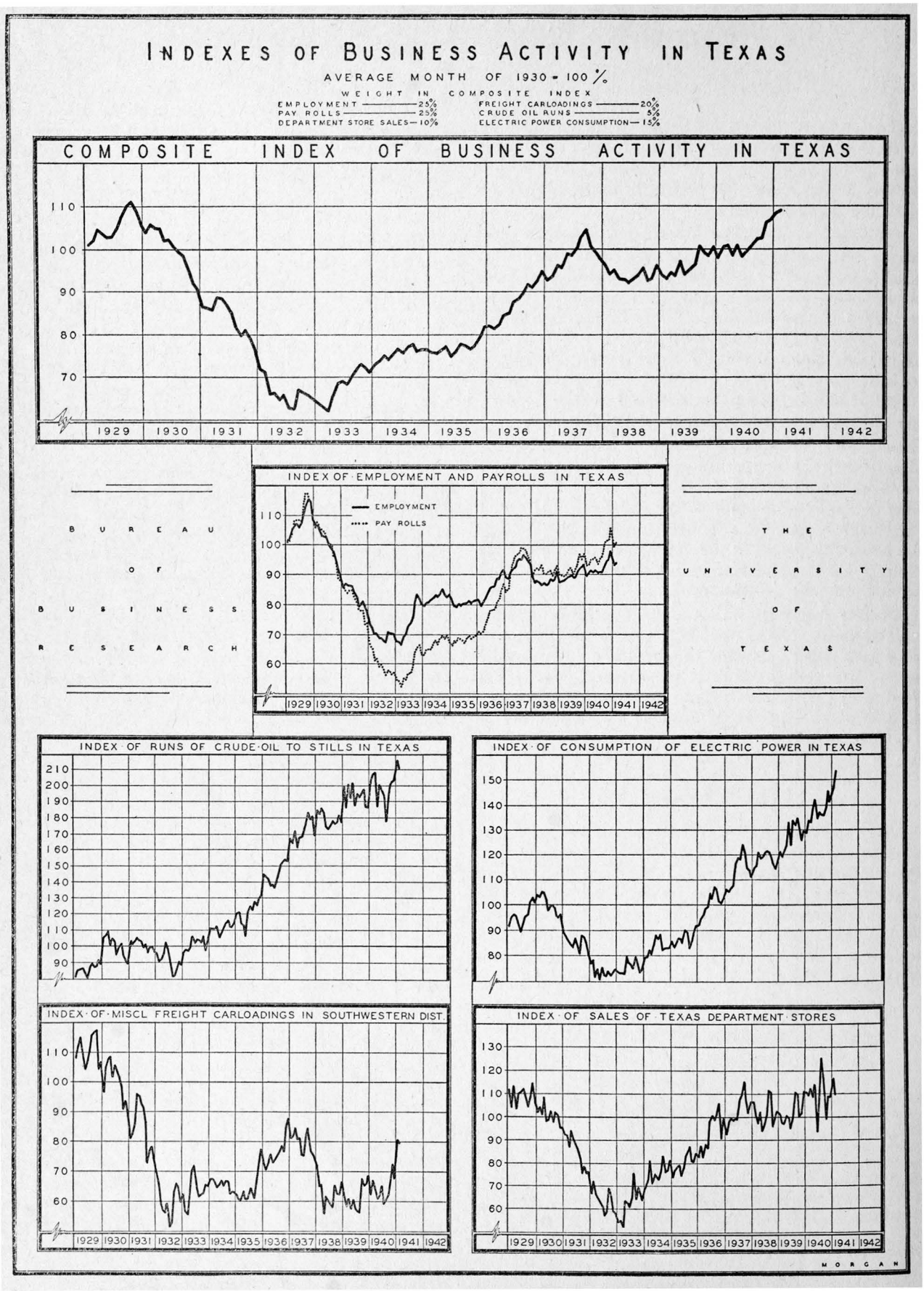

INDEXES OF BUSINESS ACTIVITY IN TEXAS
AVERAGE MONTH OF 1930 = 100 %
WEIGHT IN COMPOSITE INDEX
EMPLOYMENT — 25%
PAY ROLLS — 25%
DEPARTMENT STORE SALES — 10%
FREIGHT CARLOADINGS — 20%
CRUDE OIL RUNS — 5%
ELECTRIC POWER CONSUMPTION — 15%
COMPOSITE INDEX OF BUSINESS ACTIVITY IN TEXAS
110
100
90
80
70
1929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

Business Review and Prospect

General Business

Production in the heavy industries of the country has about reached theoretical capacity and further substantial increase in output awaits plant expansion which is now under way in many lines, especially in those directly related to the defense program.

Barron's index of industry and trade, which now stands at 98.5, reflects the saturated condition of industrial capacity, since the index is at virtually the same level as it was two weeks ago. It is probable that no appreciable change will occur in the index during the next few weeks. The margin of gain over a year ago, which is now about twenty-four per cent, promises to widen still more, however, since last year at this period the trend of industrial activity has been definitely downward; whereas, now it is virtually horizontal.

The secondary influence of defense expenditures is making itself felt to an increasing extent with the growth of pay rolls and the resulting rise in retail sales. Prices of a number of staple farm products are being affected by the increased urban demand, although up to the present time farm commodity prices in the main have recovered only partially from the abnormally low level to which they descended after the depression of 1937.

It is expected that the various forces making for more intense business activity will continue gradually to reinforce each other, causing the business indexes ultimately to rise well above their present high level. The upward trend will not become pronounced, however, until new plant capacity is brought into operation in the defense industries and in those closely related to them.

Texas Business

Industry and trade in Texas maintained, during February, a substantial margin of gain over last year, but there was no measurable change from January to February of the current year. All of the factors entering into the composite index number showed gains over February, 1940, but only three of them (employment, pay rolls, and electric power consumption) registered gains over both January of the current year and February a year ago.

INDEXES OF BUSINESS ACTIVITY IN TEXAS

	Feb. 1941	Feb. 1940	Jan. 1941
Employment	93.9	90.1	93.3
Pay Rolls	100.9	93.2	99.6
Miscellaneous Freight Carloadings (Southwest District)	79.7	67.0	80.7
Crude Runs to Stills	210.8	207.4	216.0*
Department Store Sales	109.8	109.3	116.6
Electric Power Consumption	152.9	133.0	147.0*
COMPOSITE INDEX	109.1	100.5	108.9*

*Revised.

The outlook for further improvement in Texas business remains favorable. All three of the major sources of income in the State are rising (see cover page), and retail trade is expected to show its usual close relation to changes in spendable income.

Farm Cash Income

The distinguishing characteristic of this Bureau's monthly computation of farm cash income is that the estimates are made not only for the entire State but also for each of the crop reporting districts of the State. The studies on the *Natural Regions of Texas* by Elmer H. Johnson of this Bureau, and the utilization of his studies by the United States Department of Agriculture in redistricting the State for crop reporting purposes, has made possible a precision in the use of current agricultural statistical data for income computing purposes not otherwise attainable.

In this issue of the Review, Mr. Johnson presents in brief outline some of the significant factors which are basic to agricultural production in the various crop reporting districts of the State. The relative homogeneity of natural conditions within the respective districts is reflected in every district in a high degree of agricultural specialization so that the major part of the income for a given district is derived from only four or five major types of crop and livestock enterprises. This high degree of concentration of special crop and livestock production within clearly defined geographic areas of the State, with the resulting huge surplus production and commercial marketings arising from this situation, contributes to the accuracy of the reported farm prices. Thus, with a large proportion of farm products entering commercial channels as a result of regional specialization and the consequent reliability of the reported farm prices, the computed farm cash income for each district and hence for the State has attained a high degree of accuracy. The remaining margin of understatement is gradually being reduced as the research studies on income advance. The principal remaining problem relates to computing the value of local marketings of such products as poultry, eggs, meat animals, fruits, and vegetables. Studies under way for determining per capita consumption will aid in securing more complete information on the income from these products.

Current Farm Cash Income

Cash income from agriculture in Texas continues to run well ahead of last year, and the decline from January to February was less than usual.

Computed farm cash income for February of $16,326,000 represents a gain of more than fifteen per cent over February last year, and the January-February income of $37,740,000 indicates an increase of more than twenty-one per cent over the corresponding period a year ago.

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

INDEX OF AGRICULTURAL CASH INCOME IN TEXAS

Districts	Feb. 1941	Jan. 1941	Feb. 1940	Cumulative Income Jan.–Feb. 1941	Cumulative Income Jan.–Feb. 1940
				(000 Omitted)	
1–N	74.5	59.2	74.0	3,197	3,086
1–S	147.8	125.2	119.2	4,133	3,004
2	104.7	100.2	75.7	4,088	2,788
3	133.2	113.5	115.2	2,041	1,728
4	94.9	87.3	76.7	4,975	3,865
5	78.9	72.4	47.3	1,438	822
6	221.0	121.7	107.0	3,366	2,426
7	137.0	155.7	144.7	2,282	2,212
8	115.0	120.2	105.2	2,530	2,114
9	137.4	180.8	114.6	3,707	2,575
10	72.2	125.4	84.4	819	886
10–A	133.8	154.4	178.2	5,164	5,628
STATE	116.4	109.3	101.7	37,740	31,134

Most of the gain in income is the result of the rise in prices of livestock and livestock products and does not, in the main, reflect an increase in marketings. The rise in prices of staple Texas farm products promises to go still further as the year advances and should this increase in prices later be accompanied by a rising volume of marketings, as seems probable, the margin of gain in farm cash income in comparison with 1940 will tend to widen. Assuming that government subsidies in agriculture will not vary greatly from a year ago, rural buying power in Texas may be expected to improve substantially.

F. A. Buechel.

Crop Reporting Districts in Texas

INTRODUCTION

Geographic Perspective

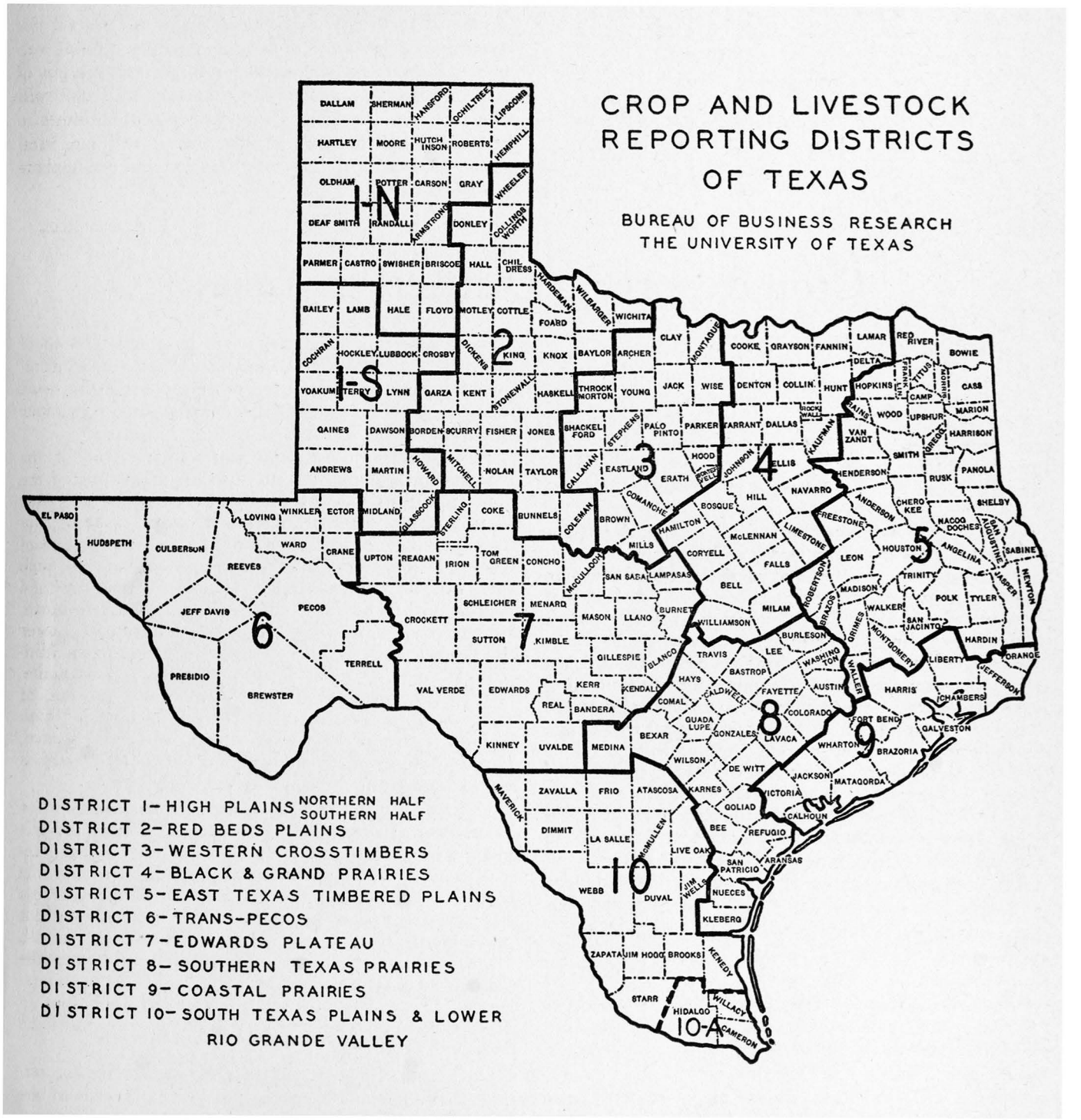
First fact of importance about Texas is its size—its total area comprises 265,896 square miles, which is a little more than one-twelfth of the total area of continental United States. A second fact concerns the geographic location of this vast territory, reaching in the Panhandle from north of the latitude of Oklahoma City southward into the subtropical citrus growing lands of the Lower Rio Grande, and in an east-west direction extending from the humid forest lands of longleaf and shortleaf pines in East Texas, across the broad expanses of the rolling Texas Prairies and westward to the variegated short-grass plains of Western Texas, to the isolated mountains and associated phenomena of the Trans-Pecos region and the sandy bolsons and gravelly mesas of the El Paso country. A third fact is locational also—the geographic position of Texas with reference to the Gulf of Mexico, its location eastward of the Rocky Mountain elements, its position embracing the southernmost portions of the Western Plains and Prairies of the North American continent. A fourth fact is associated with all three of the foregoing: the great diversity of surface and sub-surface environments of the State, and related to this diversity, the widely varied natural resources occurring in large proportions owing to the basic conditions of the State's climate, geographic geology, and physiography. Still another aspect of Texas—a corollary of location—is the geographic orientation of the State: this includes, (a) its location on the Gulf of Mexico and therefore its access to deepwater transportation, and thus to the Eastern Seaboard and to world markets as well; (b) its situation with reference to Latin American lands bordering the Gulf of Mexico and the Caribbean Sea; and (c) its location with reference to the structural geologic elements comprising the architecture of the North American continent.

Because of the extent and the diversity of the area embraced in Texas it is necessary to consider for the purpose of certain analyses, a practical sub-dividing of the State. Such subdivisions if used for agricultural purposes must be so laid out as to include within each district a general homogeneity of agricultural and range conditions.

Factors basic to regional subdivision: One of the fundamental factors basic to such a sub-dividing of the State is climate. A most striking fact concerning this environmental factor in Texas is the great range of contrasted climatic conditions within the State; these extend westward from humid East Texas and its luxuriant pine forests through the moderately humid Prairies into and beyond the sub-humid Plains; and from south to north, climatic conditions range from the sub-tropical Lower Rio Grande Valley with its citrus production to the Mid-latitude wheat growing lands of the Texas Panhandle. This wide range in climatic conditions is a function of the geographic location of the State in conjunction with the vast extent of Texas—the latter feature illustrated, for instance, by the fact that the Panhandle country is nearer Kansas City than it is to the Gulf Coast.

Climatically, a very large share of the territory of Texas has a climate suitable for growing cotton, and this in spite of the fact that from the standpoint of temperature, such features as seasonal temperatures and the length of the growing season vary considerably across the State from south to north, i.e., from citrus to wheat production. But great differences in annual rainfall, the wide variations in the type of occurrence, and the seasonal distribution of the rainfall result in fundamental differences and greatly contrasted conditions in the physical environment of the different sections of the State.

Obviously, climatic conditions are responsible for certain of the larger differences in the environment of the State. It is obvious that the sweep of climatic variations gives the broader divisions of the State. Differences wrought by the factors of geographic geology and physiography, however, are also of outstanding importance agriculturally and otherwise, not only in the laying out of the larger homogeneous sections of the


CROP AND LIVESTOCK REPORTING DISTRICTS OF TEXAS
BUREAU OF BUSINESS RESEARCH
THE UNIVERSITY OF TEXAS
DISTRICT 1-HIGH PLAINS NORTHERN HALF
SOUTHERN HALF
DISTRICT 2-RED BEDS PLAINS
DISTRICT 3-WESTERN CROSSTIMBERS
DISTRICT 4-BLACK & GRAND PRAIRIES
DISTRICT 5-EAST TEXAS TIMBERED PLAINS
DISTRICT 6-TRANS-PECOS
DISTRICT 7-EDWARDS PLATEAU
DISTRICT 8-SOUTHERN TEXAS PRAIRIES
DISTRICT 9-COASTAL PRAIRIES
DISTRICT 10-SOUTH TEXAS PLAINS & LOWER RIO GRANDE VALLEY

State, but also in bringing about very significant differentiations within these large climatic regions. That is, the larger divisions based on obvious climatic differences are sub-divided on the bases and reactions of physiographic conditions and outcrops of geologic materials.

The outstanding features of the geographic geology and physiography of Texas are distinctively expressed in the larger physiographic provinces which also are so obvious. These include the Trans-Pecos—veritably a country unto itself, the southernmost units of the Great Plains (which include the High Plains and the Edwards Plateau), the Central Denuded Region, and the Texas sections of the Gulf Coastal Plain.

The very close inter-relationships of these two major and basic environmental features—the climatic factors and the geographic geology and physiography—are reflected primarily in the conditions and characteristic features of water supplies—of surface waters, soil moisture, and underground supplies.

In the light of the close inter-relations of water conditions, climatic features, and the geographic geology and physiography within any given extent of territory, it is possible to interpret scientifically the distribution and characteristics of the derived environmental features —of both soils and natural vegetation, and therefore the bases of agricultural production in the area or region concerned.

The geographic geology and the interrelated physiography of the several regions of Texas give a topographic distinction to the characteristics of the various natural divisions or regions of the State. For instance, faulting and the relative position of fault blocks together with widespread vulcanism in places, are predominant in forming the landscape of much of the Trans-Pecos country. The rest of the State is dominantly made up of a series of plains, arranged in a sort of stair-step pattern steadily rising from the coast westward. In these various plains the surface occurrence of hard or soft rocks, of resistant or friable geologic materials, the occurrence of sculpturing effects of erosion on the one hand or of the constructional effects of deposition on the other, are the factors generally determining the characteristics of the landscape. Flattish plains, wherever they occur in Texas, almost always indicate constructional lands; dissected and rugged areas, scarps, and the like, obviously reflect conditions in which erosional forces now at least are dominant. Rolling plains, as a rule, indicate some degree of balance between constructional aspects of surface deposition or aggradation on the one hand and the degradational effects of erosion on the other; within the larger region, the type of topography indicates the degree of dominance of constructional or of destructional forces in the particular area.

To sum up: It may be stated briefly that excepting the Trans-Pecos country—much of which is a region entirely different from the rest of the State—Texas is made up of a series of plains, often of belted pattern, which rise gradually interiorward from the Gulf Coast, and which are separated by a series of topographic breaks or escarpments. A large share of the area of Texas is characterized by the distinctly belted pattern of topography, which is so distinctively expressed throughout the Coastal Plain and the Red Beds Plains. In these cases, the surface is dominated by topographic lowlands, characteristically developed on "weaker" geologic outcrops. The surface of these lowlands may be characterized by somewhat dissected conditions on the one hand or by a flattish surface on the other, or it may have an intermediate type of somewhat subdued rolling topography, the units of which are more or less sharply set off from each other by scarps, many of which are a result of differential erosion and denudation. In addition to the belted plains there occur tableland regions of large extent in varying degrees of dissection, such as is the case of the Edwards Plateau and the High Plains. These tablelands are bordered in part by escarpments, some of which are steep and sharp featured, or they may be rather subdued due to a combination of various physiographic circumstances.

Historical Perspective

Historically, the development of Texas may be said to represent a series of economic and social adjustments to the physical geographic conditions of the various regions concerned, each series of these adjustments being conditioned by the availability of technologic equipment and cultural attainments which at that period could be applied to the utilization of the natural resources concerned.

Each of these series of adjustments may be regarded as an historical sector in the conquest of environmental conditions of this portion of the North American continent. Disregarding here the pre-Anglo American occupation of Texas, the economic conquest of the State and the utilization of its natural resources took the form of great wave-like movements which advanced zone-wise across Texas. The early Anglo-American settlements were in the humid sections of the eastern part of the State and along major streams such as the Colorado and the Brazos; by the middle of last century, settlements had progressed into Central Texas. The ingress of German colonists and the formation of agricultural settlements, such as New Braunfels and Fredericksburg, were well begun by the middle of last century. Still another feature of the early Anglo-American occupation was that concerned with ranching in the coastal lands of Texas, particularly in the section south of Houston.

In this earlier period of western expansion settlers generally avoided the open landscapes of the Black Prairies with their rich soils north of the Colorado River; there were a number of definite reasons for this evasion. But about the middle of the century there began a wave of settlements which crossed the rolling lands of the then waterless interstream areas of the Black Prairies and located beyond them in the wooded country of the Eastern and Western Cross Timbers. These strips of timbered country lying between the Prairies and the short-grass plains to the west, remained for a quarter of a century a prominent frontier zone in Texas.

From the Cross Timbers belt westward nearly to the Rio Grande in New Mexico, the flattish to rolling plains country extended as a vast barrier—a barrier due primarily to the scarcity of surface waters; but it was a barrier which was all the more serious owing to the presence of roving Indian tribesmen whose knowledge of strategy and whose fighting ability on their own ground have never been questioned.

It was not until 1874 that Mackenzie broke the backbone of the Indian resistance in West Texas; then followed in rapid order the slaughter of the buffalo—of the Great Southern herd. For a short period great quantities of buffalo hides were hauled to such depots as Fort Griffin, Texas, and Dodge City, Kansas.

With the buffalo gone the Indian menace of the Plains was laid for all time, and in short order the pioneer cattlemen moved in. A new era in the settlement of the West had begun. As Frederick Jackson Turner has observed: "The day of river settlements (in the Westward Movement) was succeeded by the era of inter-river settlement and railway transportation." Following the great tide of cattle that literally swept the Western Plains, came the railways and the railway engineers who solved the problem of water supply by drilling deep wells. Then in rapid succession came the wind-mill, barbed-wire fencing, and, after the turn of the century, farming operations in these Western Plains began a steady expansion which as a dominant movement was to continue through a period of three decades.

While ranching in the western part of the State was being revolutionized in the decades of the 70's and 80's, another phase of development was taking place in the central and eastern sections of Texas. Railway extension was opening up the Black Prairies for cotton growing, making them the premier cotton region of the world, and at the same time it was initiating a movement for large scale lumbering activities in the forests of East Texas. The growth of railroad operations in Texas during these decades at the close of last century was reflected not only in the extension of farming, ranching, and lumbering operations but also in the rise of important commercial centers. The importance of oil and other mineral resources together with their revolutionary effects upon the economy of Texas came after the turn of the century.

THE CROP REPORTING DISTRICTS AND REGIONAL ANALYSIS

The crop reporting districts of Texas are so laid out as to include within each the greatest degree of agricultural and range homogeneity possible in the limited number of districts practicable for the purposes concerned.

It is to be kept in mind, however, that within each district occur areas of considerable size, either individually or in the aggregate, whose special characteristics depart markedly from the general environment of the district.

Knowledge of basic features concerning the physical environment of these various districts makes possible and is an essential requisite to a common sense interpretation of the agricultural or range utilization of the lands involved.

A natural region is an extent of territory characterized throughout by a distinctive homogeneity of the basic factors comprising its physical environment; it is a geographic unit embracing an area characterized by the likeness of its physical features and natural resources. This homogeneity unmistakably differentiates the region from adjacent territory which in turn is comprised within other natural regions. Broadly speaking, the degree of homogeneity is a function primarily of the elements of the geographic geology, including physiography, and the climate of the territory concerned. The characteristics of this homogeneity are determined basically by the interactions of climate and geographic geology (of the past, as well as the present) and are expressed physically in the physiography and water supply, the natural vegetation and soils, and in the variety, characteristics, and extent of mineral resources of the region.

The various elements comprising a region, whether environmental factors or those pertaining to resources, are inter-related and as a rule are interdependent; the homogeneity of the region is itself an expression of this inherent inter-relationship.

The concepts of an economic region, of regional economics, or of the highly important feature of the integration of the regional economies of a state or nation are all closely related to the concept of the natural regions concerned, as above defined.

Economic and social adjustments to areal units of the physical environment, i.e. the natural regions, are functions of the impact of economic movements, of forces and trends which in turn express themselves in the pattern of occupation and the type and form of utilization of the natural resources of the region concerned. The natural region is an areal expression of natural factors; it remains pretty well fixed so far as human time is concerned. The economic region represents the superimposition of a set of institutional factors upon the natural region or portions thereof; the economic region is therefore subject to changes, often of marked extent, even within the time limits of one generation. (Note: In this brief survey of the crop reporting districts, all items pertaining to oil, natural gas, non-metallic resources, and industrial development are intentionally omitted.)

The Trans-Pecos

(District 6)

Of Texas regions the Trans-Pecos landscape even to the untrained eye is different. It is different indeed from other portions of Texas and from other portions of Southwestern United States. Geologically speaking its structure is highly complex; this structure is dominated by the greatly disturbed conditions of its underlying rocks. It is dominated by the displacement of great fault blocks and the attendant sharp-faced, steep, and often high topographic escarpments, between which are the intervening, often down-faulted lowlands of considerable size now wholly or in part deeply covered with

alluvial fill which has been carried in from the adjacent highland areas. These fills form plains of local extent, most of which in the Trans-Pecos are bolsons, though some of them have been subject to considerable erosion and comprise the so-called mesas. In addition to the fault-block highlands, now greatly modified by erosion, and the intervening lowlands deeply covered over by constructional materials, large areas within the Trans-Pecos are the products of widespread vulcanism. Great lava flows occurred in Tertiary time; the Davis Mountains, now somewhat modified by erosion, were formed in one of these periods of vulcanism. In addition to these physiographic features of mountain ranges and intervening basins which give distinction to the landscape of the Trans-Pecos, there is included along the eastern margin another type of physiographic expression —the Stockton Plateau which is the western continuation (west of the Pecos) of the Edwards Plateau, and the Pecos Lowland area, both of which belong to the physiographic province of the Great Plains.

Neither the apparent order of occurrence of the dominant structural elements nor the details of the physiographic features of the Trans-Pecos will be given consideration here; instead, only the general classification which includes the highlands and mountain elements, the intervening filled-in lowlands, and the marginal plains must suffice. (Parenthetically, the crossing of several major physiographic features in the Trans-Pecos may be noted: 1. that represented by the Franklin Mountains, a continuation of the north-south trend of the San Andreas and Organ Mountains of New Mexico; 2. that of the Hueco, Quitman, Eagle, Sierra Vieja, Chinati, and Bofecillos ranges; 3. the Guadalupe, Ord and Santiago ranges, together with the Davis Mountains; and 4. the Trans-continental Lineament, the master lineament of southwestern United States, with a north-west south-east trend.) Locally, as on the Diablo Plateau and in the Davis Mountains, occur constructional areas—alluvial or overwash deposition on slight slopes; these constructional areas together with the lower portions of the filled-in valley lowlands have deeper soils and therefore naturally comprise the better grazing lands. The sharp-featured escarpments and much of the marginal portions of the highland areas are strongly erosional and thus have little or no soil. Such areas often form the picturesque landscapes so aptly designated by Dr. Robert T. Hill as rock-scapes.

Scenically, the Trans-Pecos is a country unto itself. The expression of its many landscapes is indeed different; its scenic views are at once simple and majestic; its contrasts magnificent. It is a wonderland, scientifically and otherwise—a wonderland which, in the century that has elapsed since the first scientific expeditions entered it, has but slowly yielded up its secrets; indeed, many of these secrets it still effectively conceals. The Big Bend district is a vast faultbroken, dissected plateau which continues into Mexico and from which it is separated only by the Rio Grande with its magnificent canyoned courses and narrow gorges, of which the Santa Helena Canyon is an outstanding example. Mountain eminences in the Trans-Pecos include El Capitan, Guadalupe Peak, Mount Livermore, Eagle Mountain, the Chisos Mountains and others, all outstanding as scenic features, and with most of which are associated scientific problems of wide interest.

The territory of the Trans-Pecos country itself is without outside drainage; the Rio Grande and the Pecos are through-flowing streams which in that region resemble great trenches or canals; within the Texas portion of the Trans-Pecos these two master streams receive no permanent tributaries of any consequence.

Water supplies of this district are obtained from the Rio Grande, from wells in the deep filled-in materials of the bolson areas and from springs which occur in and about the margins of the volcanic materials of the Davis Mountains and in various other scattered places as the Hueco Tanks, including such appropriately named watering places as Apache Spring, Rustler Spring, Bone Springs and the like.

Owing to its geographic location, the Trans-Pecos is a land of little rain, comparatively speaking; on the elevated areas, however, evaporation is greatly reduced, thus extending considerably the effectiveness of the rainfall, and lowlands at the foot of strong slopes receive large amounts of flood waters following heavy rains. Much of the rainfall is of a sporadic nature, the rainy season occurring in July, August, and September. The disposal of the rainfall varies considerably with the type of occurrence and with the surface conditions of the area where it falls. The characteristically dry arroyas, for instance, may suddenly become raging torrents, capable of destroying whatever is in the way; particularly do the sporadic downpours reflect conditions characteristic of other dry regions of the world.

In the Trans-Pecos the outstanding factors in various features of the physical environment—climate and weather, physiography and geographic geology, water supplies and soils—are pretty thoroughly integrated in the expression of its various forms of natural vegetation. These vegetation types vary with the soil and the rainfall, from the typical short grass and the shrubby woody growth (creosote bush, e.g.) on the one hand where the soils are deeper, or of the cacti-lechuguilla rocky slope types on the other, to the scattered timbered cover on the isolated mountain slopes and the heavier timber on the summits of some of the higher elevations.

The most important natural resource of the Trans-Pecos other than water is the natural vegetation—short grasses and browse plants—which supports the very important and highly distinctive livestock industry of that section of the State. Livestock production will long remain a dominant economic interest of the region.

Irrigation is, of course, very important, but the area irrigated is and can be at most but a small fraction of the total. Most important irrigated area is that of the alluvial lands along the Rio Grande lowland below El Paso; a complementary irrigated section is that along the Rio Grande above El Paso—the Mesilla Valley country of New Mexico—which comprises also an important item in the trade territory of El Paso. Elsewhere in the

Trans-Pecos, about the margins of the Davis Mountains and between the Davis Mountains and the Pecos River, occur local irrigated areas which in spite of their limited area are of considerable importance to the economy of the region.

An item of economic consideration in the Trans-Pecos which deserves much more serious attention than has been given it is that of its many and varied scenic attractions. For simplicity of grandeur, for sharpness of contrasts, for being different and presenting the unexpected either in landscapes, vegetation, or local color, various portions of the Trans-Pecos are without a rival.

The Great Plains

The Great Plains physiographic province includes in Texas the High Plains region and the Edwards Plateau. The Great Plains includes the plains zone lying east of the Rocky Mountains, and extends from Canada to the Rio Grande.

The High Plains

(Districts 1–N and 1–S)

Physiographically the High Plains country is a gigantic tableland; it is a vast quadrangular shaped, mesa-like region, which stands out rather sharply high above the erosional plains of lower elevation at both its eastern and western margins: the Red Beds Plains at the east and the Pecos Lowland of New Mexico at the west. The steep, sharp featured escarpments of the High Plains—the caprock—are supported by the thick layers of caliche which resist erosion and into which the precipitous cuts of marginal canyons along the eastern and northern margins have been extended. Geologically, the underlying foundation of this region—an old, erosionally planed-off surface—has been appropriately designated by Dr. Hill as the Platform of the Plains. This old surface—the land surface at a former geologic time—has since been covered over by stream deposited sediments, spread out in large apron-like forms, and comprising great lenses of sands and gravels which now serve as aquifiers. These coarser deposits in turn were subsequently blanketed by rather thick deposits of fine-textured materials which can hardly be anything other than the result of wind erosion and deposition. Wind erosion, it may be noted, has for ages been of extreme importance in the physiography of the entire Southwest, not only in its sculpturing effects but also as a depositional agent.

The High Plains country is a plain though it is neither flat nor level. South of the Canadian trench it has a gentle slope to the southeast, and the surface most everywhere is marked by the occurrence of sinks or shallow lakes; the generally billowy-like topography which prevails over the lands between these sinks is a characteristic feature of the High Plains as a whole. It may be noted here that the trench and adjacent breaks of the Canadian River constitute a physiographic feature which in size and variety is one of no small proportions.

The High Plains region is a representative short-grass country—perhaps the most representative of such regions in the world; yet by no means was all the territory of the High Plains originally typical short-grass country. Wherever occur variations from the smooth surface conditions underlain by silty clays or clay loams, whether these variations are reflected only in topography or by geologic materials, or both, the change is reflected at once in the vegetation, the vegetative cover thereon departing more or less sharply from the typical stand of the pure short-grass cover. With the occupation of these lands by white men, with the general occurrence of overgrazing and the reduction by widespread grass fires, the woody and other non-grass vegetation has expanded at the expense of the short grasses.

Chief among the physiographic features which bring about important variations from the representative High Plains environment are the breaks of the Canadian, the canyoned eastern margin of the Plains, the sandy strips (in places well developed sand dunes, many of them mobile and covering considerable areas, have been formed) which occur at the western and particularly at the southwestern sections of the High Plains region, and the floors of the deeper sinks. These areas whose characteristics depart from the representative conditions of the short-grass environment now remain as range lands whereas a large percentage of the representative short-grass country—characterized by its smooth areas and heavier textured soils—is now occupied by farms.

Naturally, the rainfall of the High Plains decreases westward; and, of course, the evaporation increases southward. But, in addition, the High Plains country, due to textural differences of surface materials, is differentiated from east to west into a zonal pattern; these north-south extending zones are associated with important differences in the dominant textures of the surface geologic materials, the finest textures occurring along the eastern margin. Considered in somewhat more detail these textural zones have a north-west south-east trend: the finest textured surface materials occur at the north-eastern portion of the Plains, whereas the deepest sands —the coarse textured materials—occur along the south-western margin; between these zones of extreme textures for the High Plains occur belts whose materials are transitional in texture between the coarser sands on the one hand and the fine textured clays on the other.

Only one permanent stream, the Canadian, entirely crosses the Texas portion of the High Plains. Much of the excess moisture in the rainy season flows into the numerous sinks which are so distinctive as a characteristic of the plains landscape; on the representative upland surfaces, sheet erosion rather than the gully type is the more important. On the steeper slopes, however, gully erosion may become severe and extremely harmful.

The underground water supply is tapped by numerous wells and the familiar wind-mill is everywhere one of the distinctive features of the landscape of the High Plains. In recent years the widespread use of irrigation water from wells has been attracting increasing attention; this is particularly the case over fairly large areas north and northwest of Lubbock.

The climate of the High Plains is sub-humid, with the average rainfall decreasing westward. Over a period of several years the low rainfall in some of the years is readily apparent as the critical factor limiting the annual agricultural production of the region. Irregularities

in its seasonal occurrence and areal distribution as well as in the type of its occurrence still further reduce the usefulness of the total annual rainfall.

On the other hand, the soils of the High Plains are very fertile and deep, and with sufficient moisture they are extremely productive; nor is there any indication but that this high productivity can be maintained for a long time to come. The soils of the High Plains belong to the Black Earth or Chernozem group of soils, a group noted the world over for its high inherent fertility.

The possibility for the settling of the High Plains was realized in the 1870's, with the removal of the Indians and the slaughter of the great buffalo herds. Cattle ranches were established as soon as the buffalo were gone and in the '80's a veritable tide of cattle swept into and across the High Plains country. With the extension of railways across the plains in the '80's came deep drilling for water. The well-drill, the wind-mill, and barbed-wire fencing, together with the railroad, all were important and critical items in the cattleman's conquest of these short-grass lands, just as a little later the advent of large power-machinery made possible the agricultural conquest of the arable areas of these lands so admirably adapted to large-scale utilization by machinery.

The production of livestock is important throughout the entire extent of the High Plains; differences in the distribution of cash crops, however, makes necessary a subdivision of the region into northern and southern sections. In the northern portion, 1–N, wheat is the dominant farm enterprise, whereas in the southern portion, 1–S, it is cotton and cotton seed, together with large production of grain sorghums.

The Edwards Plateau

(District 7)

The Edwards Plateau is the southernmost segment of the Great Plains, the latter comprising a vast physiographic province of North America lying east of the Cordilleras, and which stretches from the great wheat lands of western Canada southward across the United States to the Rio Grande.

Physiographically, the Edwards Plateau is a great tableland underlain by nearly horizontal limestone strata. These limestone strata are well consolidated, and unlike the High Plains, the Edwards Plateau region as a whole is not covered over by a thick blanket of unconsolidated sediments. The undissected, smooth-featured summit remnants of a former plain in the central and northwestern portions of the region are covered with such deposits on which has developed a black soil which is fairly deep. The margins of the Plateau are frayed and dissected by erosion into a pleasing variety of physiographic features; much of this marginal country is designated locally as the "hill country," and in places as "the mountains." On such erosional lands soils at best are thin; over considerable areas they are very thin, the bare rock materials or caliche being exposed at the surface.

The eastern and southern margin of the Edwards Plateau ends abruptly with the Balcones Escarpment—which is a great faulted zone, now dissected and eroded, and which marks the meeting place of the Great Plains province with that of the Coastal Plains. The Balcones is truly one of the great lineaments and dividing zones of the continent of North America.

This section of the Plateau along the Balcones zone has been thoroughly dissected; interiorward, the landscape is characteristically that of a mature stage in the development of the existing topographic cycle. The surface interior from the Balcones Escarpment is dominantly erosional, and over large areas occur the typical rock terraced slopes on the Glen Rose formation. One sector of this formation comprises alternating layers of marly clays (generally weathering to a yellowish hue) interstratified with thinner layers of limestone. The weathering of these alternating beds produces the terrace effect, the resistant limestone layers jutting out, thus forming the ledges, with the slopes on the intervening thicker clay layers.

The Edwards Plateau is primarily a grazing country. Owing to its size and the variety of physical conditions it embraces, this region is of primary importance in making up the agricultural picture of Texas. The smoother summit areas with their heavy textured black soils present typically a savanna landscape. The rich soils support an excellent growth of short grasses, the representative one being the sub-tropical mesquite grass.

The rather narrow valley lowlands are underlain with alluvial soils which in many cases are now used for the growing of crops. To a large extent the crops thus grown are supplemental to the livestock industry. The width of these valleys is of course relative. Compared with valleys of streams of similar size in the unconsolidated beds of the Coastal Plain, they are narrow; relative to the size of the streams now occupying them, they are wide and deep.

Not only do the erosional and dissected margins of the Edwards Plateau serve to diversify the environment of the region, but because of geologic and climatic conditions, each of these frayed and variegated marginal sections has distinctive qualities peculiarly its own, thus serving to differentiate the Edwards Plateau into a number of distinctive sub-regions. Each of these sub-regions is marked distinctively by its characteristic vegetative cover.

In brief, the southwestern portion of the Plateau, often strongly erosional, dominantly with very thin soils, and subject to long, dry periods of high temperatures is characterized by a sub-tropical vegetation dominated by shrubs (such as the creosote bush or the guajillo) on the one hand or the lechuguilla-agave type on the other. The creosote bush occupies areas underlain by softer materials; the agave-lechuguilla type by hard fragmented rocks, usually characterized by a rough surface. This section of the Edwards Plateau is distinctively subtropical in character.

The southern and eastern margin—the maturely dissected country along and interior from the Balcones Escarpment, much of which has been developed on the Glen Rose formation and is also marked by the prevalence of shallow caliche—comprises the picturesque cedar brakes country. Cedar growth generally characterizes very rocky slopes with practically no soil at all;

cedar brakes also are found on such areas throughout the Plateau except in the southwest corner, where a different vegetation—one containing scattering cedars of the western type—prevails. The cedar brakes country comprises a zone of irregular boundaries, many miles in width, which extends as a great vegetation formation from the Colorado River to the vicinity of Uvalde. Cedar brakes areas also extend north of the Colorado River but owing to the type of dissection, not as a continuous vegetation formation which is so characteristic south of the Colorado.

The Balcones zone is noted particularly for the occurrence of immense springs which literally burst forth along this margin of the Edwards Plateau and whose clear waters in several cases form rivers. These springs, from Austin to Del Rio, and their attendant rivers are outstanding as scenic features. They are important also as sources of water supply. And, it would be a curious fact indeed should these sources of permanent water supply not have been of outstanding importance from the distant periods of pre-historic occupation even down to the present.

The western margin of the Edwards Plateau country bordering the Pecos River and extending eastward therefrom is mostly a dissected and strongly erosional belt underlain by consolidated limestone. A high percentage of run-off would naturally be expected under the prevailing topographic conditions; this condition is accentuated by the characteristic rainfall which is marked by occasional heavy rains and downpours. The representative vegetation is a shrub type, such as the scattered western cedar on the higher rocky slopes and by the creosote bush on thin-soiled pediment slopes underlain by shallow caliche nearer the trench of the Pecos.

The northern margin of the Plateau, southward from the Colorado River is dissected and furthermore it is rather deeply trenched by such streams as the northeastward flowing Llano and San Saba. The productive alluvial lowlands are farmed, but even here such arable lands comprise but a small proportion of the total land area of the section in which they occur. Much of the upland areas of the central and northeastern portion of the Edwards Plateau is characterized by a live-oak savanna vegetation with the typical occurrence of short grasses, although thinner soil areas are marked by the thick shrubby growth of what locally is termed shin-oak country.

Summing up briefly, the Edwards Plateau is a great limestone tableland or mesa now more or less thoroughly dissected and whose dominantly erosional surfaces are characterized generally by very thin soils. The region stands out in the agricultural picture of Texas because of the volume and diversity of its livestock activities. The livestock production of the region is predominantly dependent upon the natural vegetation of the various portions of the Plateau; ecologically considered, the various types of physical environments represented in the various sub-divisions of the Plateau are reflected in the type and character of the vegetative cover. And as illustrative of the principles of regional economics, the various types and kinds of livestock production in the Plateau represent areal economic adjustments in ranching organization to the different environmental conditions concerned, particularly that of the natural vegetation.

The Llano Country.—Included within the crop reporting district mostly dominated by the Edwards Plateau is a section that is quite different environmentally from the Edwards Plateau country; it includes a severely denuded area from which the sedimentary rocks have been entirely removed; even the exposed underpinning of the ancient, highly resistant rocks, which are gneissic and granitic in nature, has been eroded and sculptured into topographic forms, the ones of higher elevation being known as mountains. This area has been termed the Llano country, being threaded by the Llano River just above where that stream enters the Colorado.

The landscape of the central portion of the Llano country is different from that of the Edwards Plateau—indeed, it is fundamentally different from that of any other section of the State. As a whole, the relief of the Llano country is rugged and hilly. Much of the rolling surfaces of this old-rock country are covered with coarse soils which are little more than disintegrated granitic materials. Such areas of coarse textured soils are not characterized by grass vegetation; instead, the characteristic growth is a live oak woodland with an undergrowth of leguminous herbs. The lower slopes comprising finer textured depositional materials and whose surfaces are in part constructional, support a mixed growth of live oak and mesquite trees, with some grasses, forming a typical savanna landscape.

Adjacent to the old-rock central area of the Llano country and more or less completely surrounding it is an irregular shaped zone, rolling to rough in appearance, erosional in nature and characterized by thin soils. This irregularly shaped territory is underlain by ancient rocks of Paleozoic age, generally very resistant, many of which are dolomitic limestones, though sandstones occur in some places.

Infacing escarpments of Cretaceous limestones which form the Edwards Plateau more or less completely surround and enclose the Llano country which physiographically is a lowland of denudation formed on the Llano Uplift.

Central Denuded Region

The Red Beds Plains

(District 2)

Eastward from the sharp featured cap-rock escarpment of the High Plains and northward from the frayed margins of the Edwards Plateau lies the western portion of a vast eroded and planed-off country long since designated by Dr. Hill as the Central Denuded Region; originally, Dr. Hill apparently limited the Central Denuded Region to those areas lying between the infacing or westward facing escarpments of the Cretaceous (perhaps what is now called the Goodland Escarpment) at the east and the cap-rock escarpment of the High Plains at the west. This region which comprises a varied assemblage of physiographic and other physical features

includes at the west the country of the Red Beds Plains. The Red Beds Plains portion of the Central Denuded Region embraces the southwesternmost extension of the Central plains of the United States—a major physiographic province of North America lying east of the central portion of the Great Plains.

The Red Beds Plains is a dissected country; in general, it is characterized by its broad rolling landscapes. It has a belted-cuesta type of topography whose conditions vary considerably from east to west across the belts it comprises. Rugged landscapes are characteristic of the stream cuts which extend across these cuesta ridges.

Layer by layer the strata formerly underlying this region have been stripped away by the forces of erosion and denudation. Erosional remnants such as Double Mountain or the flattish summits of the Callahan Divide not only indicate the former extent to great thicknesses of these sedimentary rocks which long since have been stripped away, exposing the generally friable Permian "red beds" materials beneath; but their summits mark the extent of the great sheet of the Comanchean Cretaceous rocks which formerly spread over the entire area.

The Permian and Triassic strata in this portion of the State dip westward and extend beneath the summit areas of the High Plains; they reappear on the western limb of this great syncline, in the Pecos Lowland of New Mexico. The exposed outcrops of these strata trend in a general north-south direction, and the Red Beds Plains region with its stair-step topographic pattern is thus a belted country, but with the sharper escarpments facing eastward, and the longer back slopes of the cuesta-patterned topography extending more or less gently westward to and underneath the next east-facing scarp, finally ending with the caprock escarpment of the High Plains.

Each of these belts of country is characterized by its own distinctive type of physiographic and other physical features which, in turn, as would be expected, are closely associated with the natural vegetation cover and the soils and therefore with the uses that now are made of the lands occupying each of these belts.

The westernmost belt of country lying below and adjacent to the cap-rock of the High Plains, comprising an irregular strip, widest at the south and almost negligible at the north, is not Permian but is Triassic in age. The more horizontal attitude of the alternating layers (sandstones with relatively thick layers of heavy clay between) has produced, as erosion and dissection progressed, a distinctive topographic type characteristic of this belt. This comprises in general the relief-upholding layers of the consolidated sandstones, now strongly erosional, and the flattish-floored lowlands on heavy clays which in places at least are blanketed by depositional materials and are characterized generally by constructional slopes.

Of the three topographic belts of the Permian, the westernmost may appropriately by designated as the Gypsum Belt or the Gypsum Plains—its rolling and dissected nature being closely related to the "strong" and thick layers of gypsum whose outcrops form characteristic escarpment features of the landscape; the easternmost belt of the Permian, also of variegated topography, is underlain by the Wichita-Albany beds (dominantly limestones at the south, but which grade into sandy clays northward toward Red River). Between these dissected and erosional belts are the fairly extensive constructional surfaces and smooth plains of the lowland belt which is characteristic of the "weaker" Clear Fork beds of the Permian. This latter region, the middle section, of the Red Beds Plains may appropriately be designated as the Abilene-Haskell Plains; northward across Red River they extend into the vicinity of Altus, Oklahoma.

Geologically the greater part by far of the Permian materials are friable; they crumble readily, and thus are very susceptible to the work of erosional agencies. Unquestionably wind erosion has long been an important factor in these regions; and deep cut, sharp faced gorges are especially characteristic of water erosion in the western portions of the Permian Plains. The thick beds of clayey materials constitute belts of physiographic weakness; the alternating, thin, more resistant beds of dolomite or sandstone or thick beds of gypsum are relief-upholding formations, which as denudation progressed, formed the north-south extending scarps whose dissected fronts and crenulated patterns give a particular distinctiveness to the belted landscape throughout the extent of the Permian Plains.

The Red Beds Plains country occupies topographically a considerably lower elevation than the High Plains; also, in contrast to the constructional landscape of the High Plains, the surface features of the Permian Plains have been produced mainly by erosional and degradational forces. A large proportion of the surface of the Permian Plains is now erosional, much of it strongly so, and such areas obviously are suitable only for range utilization.

Constructional surfaces, however, do occur in the Red Beds country; such surfaces are of two types. One type characterizes predominantly flattish areas, usually developed in elongated belts of country underlain by "weaker" geologic materials; the other occurs on the rolling areas, particularly those in the Gypsum Belt. The fine textured materials of these constructional surfaces are apparently wind deposited and on the flatter areas many of the characteristics of the High Plains are duplicated in miniature. On such flattish areas occur deep and very productive soils of the Black Earth group.

The more rolling areas of the Permian Plains country, even when covered with a blanket of finer textured materials, are in general much better adapted to range utilization than to farming; in some cases, however, with proper care, such areas with more gentle slopes can be successfully cultivated, and if moisture is adequate the yields are extraordinarily high.

Farm crops in the Red Beds Plains are dominantly cotton and grain sorghums though considerable quantities of wheat are also grown.

The Western Cross Timbers

(District 3)

Like the Permian Plains to the west the Western Cross Timbers comprise a portion of the larger physiographic sections designated as the Central Denuded Region.

Lying between the Red Beds on the one side and the Grand Prairies of the Comanchean Cretaceous limestones on the other, the north-south trending physiographic elements of the Western Cross Timbers are in the main underlain by resistant rocks, of Carboniferous age; these rocks vary from conglomerates and hard sandstone to old and strongly resistant limestones. Considered as a whole, this region is variegated upland or low plateau which presents a somewhat modified cuesta topography; the upland as a whole is rather sharply dissected by numerous streams, the larger ones being characterized by an intricate meander pattern which is deeply intrenched into the hardrock upland. This is the case of the Brazos River which flows through the rugged Palo Pinto area in a rather deep and narrow gorge. The areas underlain by resistant rocks are dominated by erosional surfaces, oftentimes with fairly steep slopes and therefore the soils in such locations are thin. Locally, strips of depositional materials occur along the streams. Though these are wooded areas, a considerable display of grasses occurs, and like the rest of the district, these lands are used mostly for grazing.

More or less local sandy areas occur, characteristic of the rolling plains underlain by the friable pack-sands of the basal Cretaceous sediments. Such "weak" rock areas support a hardwood growth of post oak and black jack woodland and are suitable for special crops, particularly peanuts and fruits. These sandy areas form one phase of the Western Cross Timbers. These sands when cleared and plowed become sources of blow sands which in many cases accumulate along the edge of cleared fields in the form of dunes.

The portion of this region underlain by resistant rocks is mainly range country. Where deeper soils have formed on local slopes of the smoother portions of the limestone uplands a certain amount of grass vegetation is characteristic; but in the main the vegetative cover is now a woodland, ranging from mesquite shrubs on the limestone uplands and on the lower slopes of constructional plains to the scrubby hardwoods characteristic of the thin soiled sandstone uplands and the higher slopes or the scraggly cedar shrubs on the steep-sloped limestone scarps.

The Coastal Plain

That part of Texas east of the Edwards Plateau and the Comanchean Cretaceous outcrops of North-central Texas is occupied by the Coastal Plain. In the main, this is a province of comparatively slight relief; nevertheless, it is one which comprises and is distinguished by a vast diversity of topographic conditions.

Physiographically, the Coastal Plain, like the Great Plains and the Central Plains, constitutes a major physiographic sub-division of the North American continent. Extending from Cape Cod and Long Island southward along the Atlantic coast, it includes all of Florida, and thence westward along the Gulf of Mexico it extends well into Texas. Geologically, the Coastal Plain is a sort of annex to the North American Continent, forming a tape of young geologic materials attached to the older hard rocks of the interior. The Coastal Plain forms a third of the area of Texas, but in this State, it bends southward and extends into Mexico, roughly paralleling the Gulf Coast. Its most southern unit, after having bent around the Gulf of Mexico, comprises the Peninsula of Yucatan.

Throughout its entire extent in North America the Coastal Plain is crossed by through-flowing streams which as a rule have cut extraordinarily broad valley lowlands at almost right angles across the strata outcrops of the generally soft and non-resistant geologic materials characteristic of the entire Coastal Plain province.

Geologically most of the formations comprising the Coastal Plain are young. In Texas particularly, and in the Black Belt of Alabama, the limy formations of the Upper Cretaceous form an inner lowland of exceptional importance, agriculturally and otherwise. The bulk of the Coastal Plains country, however, is underlain by Tertiary strata, characteristically arranged in a series of successive couplets which embrace sandy members alternating with clayey formations. In addition to the Cretaceous and Tertiary formations, the Coastal Plain also contains important Pleistocene and Recent deposits.

Geologically, the Gulf Coastal Plain, excepting the Upper or Gulf Cretaceous, comprises a series of alternating strata of sands and clays, in a couplet arrangement, which are generally unconsolidated; some limestone deposits occur in the Tertiary. These strata dip gently Gulfward. The beveled outcropping members are crossed at approximately right angles by through-flowing streams, the river valley lowlands being of considerable width.

Topographic Adjustment to the Underlying Rocks.—Though geologically young, most of the Coastal Plain country, and particularly the interior portions, has suffered considerable physiographic reduction. Stream erosion and dissection, particularly in the interior sections of the Gulf Coastal Plain, have reduced and carried away considerable portions of the exposed weak formations, thus forming a series of lowlands, which roughly parallel the present coastline; by way of contrast the somewhat more resistant formations remain exposed as ridges, the sharp scarps of which face interiorward. Usually the lowlands are formed on the unconsolidated clayey or marly layers, i.e., on the geologically weaker or less resistant layers, and the intervening ridges on the somewhat more consolidated sandy materials.

The Coastal Plain, a Belted Country.—Physiographically, the Coastal Plain country is dominantly a series of belts of alternating lowlands plains separated by rather low, subdued ridges; in general, the belts lie parallel to the Gulf Coast, though very important exceptions occur. Throughout its extent along both the Atlantic and Gulf coasts this belted pattern with its attendant patterns of economic and cultural adjustments is one of the distinguishing features in the landscape of this vast physiographic province.

The Texas Coast Line.—The gradual slope of the Coastal Prairies continues out under the Gulf of Mexico for a considerable distance. A slight elevation of the Coastline zone would give to Galveston an interior location.

The barrier beaches, elongated ridges of bare sands, paralleling the mainland have been heaped up by waves in the shallow waters. One of these, Padre Island, is a remarkable example, stretching continuously for more than a hundred miles in front of Laguna Madre, a broad shallow lagoon. Other fringing islands occur.

The shallowness of the Gulf waters has resulted in making necessary large expenditures for harbor improvements.

South Texas Plains and the Lower Rio Grande Valley

(District 10)

The belted physiographic pattern, although modified considerably in the vicinity of the through-flowing streams and along the coast, is characteristic of the entire extent of the South Texas Plains. In addition, owing to the climatic environment, this entire region is characterized generally by the occurrence of indurated caliche, often of great thicknesses. Caliche accumulations in South Texas form important topographic features of the region; modifying the soils and soil moisture relations, they are an important and often a critical factor in determining the vegetative habitat wherever they occur. Outside the river lowlands the characteristic natural vegetation is now chaparral. Prior to the coming of white man, however, these plains were characterized by a typical savanna landscape, comprising short grasses and mesquite trees, with prickly pear cactus on the heavy black soils and a restricted chaparral growth on the gravelly, thin-soiled lands and the shallow caliche areas. These rolling uplands represented one of the typical savanna districts of Texas. Paralleling the extension of grazing or over-grazing since white man's occupation and the reduction of grass fires, there has occurred a marked spread of the chaparral growth at the expense of the native grasses in this section of the State.

The belted pattern characteristics of the South Texas Plains region have been greatly modified by the influence of such streams as the Rio Grande, the Nueces and its tributaries. In addition, just to the north of the Lower Rio Grande Valley occurs a large area of deep sands characterized in places by moving dunes; this sands district constitutes a sub-region as distinctive as, although much less important economically than, the Lower Rio Grande Valley itself. There is also the characteristic district interior from the Lissie formation forming a distinctive belt which has been appropriately designated the Caliche Plateau.

Farming in the South Texas Plains is mostly carried on with the aid of irrigation. The outstanding features of the Lower Rio Grande Valley—an area whose agricultural utilization is dominated physiographically by its varied constructional topographic features—with its outstanding advantages for the production of high class citrus fruits and vegetables, are well known; the well-marked conditions of river irrigation of alluvial lands in the vicinity of Laredo and Eagle Pass, for example, and of well-water irrigation in the interior Winter Garden district are important enough to merit thorough consideration in any comprehensive economic study of Texas. Outside the irrigated lands the territory of this crop reporting district is mostly range country devoted to livestock production.

THE TEXAS PRAIRIES

The Texas Prairies formed on limy, fine textured geologic materials of the Coastal Plain constitutes one of the outstanding agricultural producing sections of North America. These moderately humid plains were formerly covered by a thick, rank growth of tall grasses, whose long roots penetrated deeply into the sub-soil. They are characterized by the rather smooth contours of a widely rolling to undulating topography and are underlain by fine textured dark to black colored soils; the rich black soil is a function of the tall grass vegetation formerly covering the Prairies lands in conjunction with the presence of fine textured geologic materials, the plentiful supply of lime, and other basic substances in these geologic materials. Geographically, the Prairies of the United States occupy a vast zone climatically transitional between the humid eastern country covered with heavy, luxuriant forest and the sub-humid, short-grass country of the Western Plains. A fact of great economic importance is that the Prairies of North America are unique in geographic occurrence; they do not occur in large areas outside of this continent. A small area of Prairies does occur in Argentina—comprising the Corn Belt of that country—but the total extent of the Argentinian Prairies is only about a third of the area of the State of Iowa. Since large prairie regions of the type of the American Prairies occur nowhere else in the world, and since they do occur in large extents in the United States, this is obviously a fact of tremendous importance in evaluating the agriculture and agricultural policies of the United States. Typical Prairies in the South occur mostly in Texas.

The Black and Grand Prairies

(District 4)

The Black and Grand Prairies of Texas, particularly the Black Prairies, may be considered as typical of the Southern Prairies of the United States. The Black Prairies country is characteristic of the rolling lands underlain by various formations of the Upper or Gulf Cretaceous—formations of soft rock or of unconsolidated materials, whose general uniformity of geologic materials is remarkable throughout their entire extent across the State. These formations outcrop in a greatly elongated pattern and on them occur quite definite strips or belts of country which have a general north-south trend. The formations whose outcrops form these distinctive strips of country of the Black Prairies comprise the Eagle Ford shales, the Austin Chalk, the Taylor Marl and the Navarro formation, the latter mainly being clays, but which have a higher sand content than and are otherwise somewhat different from the previously named formations.

The Grand Prairies are formed in part from limestone materials that are far more thoroughly consolidated than are those of the Black Prairies. They belong to the Lower Cretaceous or Comanchean strata. Physiographically, these "hard" limestone strata are the relief-

upholding materials of the Grand Prairies. As a result of this feature in combination with the stage in its topographic cycle and of the type of dissection to which the region has been subjected, much of the area of the Grand Prairies is erosional and has on that account only thin soils. Such lands are suitable only for grazing; however, on the lower slopes or elsewhere where deeper soils have accumulated owing to the presence of inter-bedded clays or of the occurrence of depositional materials on gradual slopes, the lands are excellent for farming purposes.

Southward of the Brazos River the outcrops of the Comanchean limestones widen considerably, forming the Lampasas Cut Plains. The Lampasas Cut Plains is a transitional area; it is a tongue of the Edwards Plateau much more thoroughly dissected, and climatically it lies within the sub-humid zone. Owing to the type and degree of dissection, much of the area is range country but where deep enough the soils are exceptionally fertile.

Lying between the "soft" rock country of the Black Prairies and the "hard" limestone of the Grand Prairies is a relatively narrow strip of dissected hilly country underlain by sandy materials, geologically known as the Woodbine Sands. This strip is covered with hardwood trees of post oak and black jack and is known as the Eastern Cross Timbers. Much of the territory of the Eastern Cross Timbers has long been farmed, supporting general farming operations. It is an important fruit, vegetable, and poultry producing area.

The Coastal Prairie

(District 9)

The geographic position and extent of the Coastal Plain in Texas, with its characteristically belted topographic pattern and its through-flowing streams attended by wide valley lowlands, is such that its contrasted climatic range extends from the humid forested lands of eastern Texas through the moderately humid and sub-humid plains southward to the dry chaparral and shallow caliche lands along the Rio Grande. District 9 is that section of the Coastal Prairies in which humid or moderately humid conditions are predominant.

The Coastal Prairies country is commonly described as flat and some large areas are approximately flat. Generally, however, the surface is very slightly undulating and interiorward some 50 miles from the coast it becomes slightly rolling. Geologically, the Coastal Prairies are underlain by two formations of Pleistocene age; the Lissie formation and the Beaumont Clays. The Lissie formation lies inland from the Beaumont Clays, the latter extending down to and paralleling the coast. The strip of Beaumont Clays is nearly flat in the interstream areas; originally these clays were high in lime and over much of their extent they are distinctively marked by a very heavy black soil. Where well enough drained, these deep black soils areas are exceptionally productive, cotton being the characteristic crop.

The Lissie formation, interior from the flattish country of the Beaumont Clays, is characterized by an undulating to slightly rolling surface; the soils of this formation are distinctively light in color and if they once contained lime, that material has long since been leached away. The soils on the Lissie formation are thoroughly eluviated. Generally the light colored soils of the Lissie plains are underlain by a heavy, practically impervious clayey subsoil, or clay pan. This heavy clay subsoil has been developed subsequent to the deposition of the geologic material; it has been formed by the carrying downward and the leaving at that level by the percolating waters, of highly deflocculated clay particles, the deflocculation in the surface soil having been brought about by the reaction of the clay particles to the presence in small amounts of chemical substances, presumably sodium compounds.

The presence of this heavy impervious subsoil under flattish areas of these Coastal Prairies has been of great importance in rice growing in these sections of Texas, as it serves to retain and thus conserve irrigation water in the rice fields.

The Southern Texas Prairies

(District 8)

This district illustrates well the agricultural consequences of the belted succession of different strips or zones of country lying between the Balcones Escarpment and the coast. It illustrates also the reactions of soils and natural vegetation to a sub-humid climate, so that technically most of these lands, like those of the Edwards Plateau occur in the Black Earth group of soils.

The Southern Black Prairies.—Farthest interior in this district and adjacent to the Balcones Escarpment lie the so-called Southern Black Prairies, extending in a rather narrow strip from the Colorado River to the vicinity of Uvalde. This strip is underlain by rocks of the Upper Cretaceous on which a lowland plain has been formed, in part at least by erosion. Streams from the Edwards Plateau, which lies to the west and north, subsequently spread rather wide and thick deposits of alluvium, including limestone fragments or gravel, over considerable portions of this lowland strip. The presence of caliche is general but there are rather wide local differences in its occurrence. The lands underlain by fine alluvium and by the fine textured weathered materials formed in place from the "soft" Cretaceous rock have excellent soils which are well known for their high productivity.

The Coastal Prairies.—Just interior from the coast in the Corpus Christi section, in Nueces and San Patricio counties, lie the extremely flat lands of the Coastal Prairies of that portion of the State. These lands, characterized by extremely rich soils, have been converted to farms largely within the past three decades. As would naturally be expected, power-machine farming on a large scale pattern is a characteristic feature of the utilization of these lands.

The Brenham-Schulenburg-Yorktown Prairies.—About half-way between the Coastal Prairies and the Southern Black Prairies occurs a fairly wide strip of Black-land soils developed on "soft" limy materials; this strip, lying in the Tertiary belt, may be appropriately designated as

the Brenham-Schulenburg-Yorktown Prairies. This interior belt with its rich black soils is an excellent farming region. The relief is somewhat more broken than is characteristic of the Black Prairies, the stream dissection is of a finer texture, and consequently more timber growth occurs; the smooth slopes, where underlain predominantly by limy materials, are characterized by deep black soils of high productivity.

The Timbered Belts.—Alternating between these distinctive and important belts of Black-land soils, which formerly were dominantly covered with tall Prairie grasses, are fairly wide, irregularly shaped, timbered strips of hardwoods, dominated by post oaks; these wooded lands represent the southwesternmost extension of the oak-hickory forests of central United States. These belts are underlain generally by sandy materials, sandy clays, or thick deposits of coarse gravels. These timbered strips with light colored soils ordinarily have somewhat stronger relief and a considerable portion of them have a broken topography as contrasted with the more subdued relief and smooth contours of the Prairie belts. Within these timbered areas also occur "islands" of fine textured materials and black soils which can appropriately be designated as mesquite land, owing to the characteristic occurrence of that tree or shrub. Such "islands" constitute representative savanna areas. These areas now are generally farmed, making "islands" of agricultural country surrounded by timbered lands; the timbered strips or belts are used mostly for grazing purposes.

The Gulf Coast Forest Zone

The Gulf Forest zone together with the Atlantic portion of the southern Coastal Plain and Piedmont, comprises another major section of the United States which, like the Prairies, is unique in that the occurrence of this type of environment is practically limited to the North American continent.

East Texas Timbered Plains

(District 5)

The East Texas Timbered Plains comprise a typical section of the humid Gulf Coastal Plain. It contains the westernmost portion of the great Southern pine forest which is so distinctive of Southeastern United States, and which extends westward from the Atlantic Coast well into East Texas. To the west of the pine lands occur belts of heavier textured but non-limy soils; these areas comprise a section of hardwoods timber, the post oak belt, which is the southwestern extension of the oak-hickory forests of central United States. Both at the south and north the East Texas Timbered Plains country is margined by prairie conditions which widen out considerably to the west and southwest.

Physiographically, the southern portion of the East Texas Timbered Plains, as a general proposition, is relatively simple; the northern portion, which may be designated as northeastern Texas, is rather complicated, a fact directly reflected by the variegated topography. East Texas represents one of the most complex and most important of all Texas regions; many of its physical characteristics remain to be worked out and interpreted. The following description is but a brief outline of some of its features.

The interior portion is an apparently reduced and dissected peneplane. In a previous topographic cycle the land had been reduced to a nearly flattish plains condition; subsequent uplifts have rejuvenated the streams and resulted in the initiation of the existing topographic cycle. The "weaker" beds are characterized by lowlands; the "stronger" beds stand out boldly as hills or uplands.

Most of the piney woods country is characteristically sandy; the somewhat slightly rolling country of the longleaf section (a continuation of the longleaf forests from Louisiana) on the southern margin of this district is underlain by very deep sands. And along the southern edge of the longleaf district and north of the Coastal Prairie areas occurs an irregularly shaped strip of mixed hardwoods and loblolly pines, often forming a luxuriant forest growth. Immediately back from the coast occurs a strip of Coastal Prairie country.

The broad alluvial lowlands through East Texas are subject to overflow; quite generally they are characterized by heavy growths of luxuriant hardwood forests.

Most of the interior pine lands, those of the physiographically more complicated portions of northeast Texas, are more broken in relief than is characteristic of the longleaf pine country; parts of the area, such as the Red Hills country, have considerable relief. Although the soils of these shortleaf pine areas are sandy, the subsoils are not so deep as in the longleaf country and they contain a fair amount of clay. A considerable portion of the shortleaf pine country is underlain by deep red soils which are derived in part from the weathering of geologic materials containing greensand. The greensand is high in potash and the geologic materials often contain considerable quantities of shells which are, of course, high in lime. Although dissection has produced a somewhat broken, and in places a rough landscape, wherever the bright red soils are deep enough they are quite productive. Most of the shortleaf pine country is dominated by cotton production, but a rather wide list of other crops are grown including important specialized crops such as tomatoes and other vegetables, peaches, etc.

The western margin of this district lying between the pine country and the Black Prairies, is dominantly a slightly rolling plain underlain by heavy textured, non-limy materials whose soils are thoroughly eluviated; this is the post oak country, and although the soils are dominantly light in color a considerable proportion of the land in this belt is in farms. At the northern margin of the East Texas Plains are the rich alluvial lands along Sulphur and Red rivers and in between these alluvial strips occur rolling plains containing the more or less frayed-out northeastern extensions of the Black Prairies. Areas of deep black or dark colored soils in this section are highly productive.

Elmer H. Johnson.

Directory of Texas Manufacturers, 1940

The *Directory of Texas Manufacturers* dated January 1, 1941, and covering the manufacturing developments in Texas up to that date has been released.

The new Directory contains the names of approximately 9,000 firms including all types and sizes of plants classified as manufacturers by the Technical Subcommittee on Industrial Classification of the Central Statistical Board, Washington, D.C.

Section I contains the "Index of Cities" consisting of a list arranged alphabetically of the Texas towns and cities in which manufacturing plants are located. The county in which each city is located is also shown. The "Names of Firms Under Cities" includes the list of firms located in each city together with the date of establishment, a code number indicating the approximate area of distribution of the products manufactured, the name of the principal officer, and location of the home office. Numbers indicating the headings under which the products manufactured are classified follow the general information for each plant.

Section II consists of an "Index of Product Classifications" which lists the subject headings alphabetically together with the corresponding code and page number for each subject. The "Names of Firms Under Product Classifications" lists all manufacturers of each product under the product heading. Trade names are added directly under the name of the manufacturer. Because it is possible to use more than one subject heading for certain products, many cross-reference entries have been used, and it is believed that the present arrangement offers the greatest possible convenience to users of the Directory.

Although the present edition of the *Directory of Texas Manufacturers* is enlarged and includes all new firms established during the last two years, the same price of $2.00 per copy has been maintained. Inquiries or orders should be addressed to the Bureau of Business Research, The University of Texas, Austin, Texas.

ANNOUNCEMENTS

The following organizations have announced convention dates for April, 1941:

American Association of Petroleum Geologists, 26th Annual Meeting, (Convention Official, L. C. Snyder, Geology Dept., The University of Texas, Austin), Rice Hotel, Houston, April 2–4;

Texas Cotton Ginners Association, (Convention Official, John C. Thompson, 109 North Second Avenue, Dallas), San Antonio, April 3–5;

Lumbermen's Association of Texas, (Convention Official, Jack Dionne, 615 Second National Bank Bldg., Dallas), Galveston, April 7–9;

Texas Dairy Products Association, Inc. (Convention Official, A. J. Riddle, Denison), Fort Worth, April 9–10;

American Society of Agricultural Engineers, S. W. Section, (Convention Official, Dr. H. P. Smith, College Station), Dallas, April 11–12;

Southwestern Social Science Association, (Convention Official, Dr. Daniel W. Borth, L. S. U., Baton Rouge, La.), Dallas, April 11–12;

Retail Furniture Association of Texas, (Convention Official, H. E. Dill, 1521 Commerce St., Dallas), Galveston, April 20–23;

Natural Gasoline Association of America, Annual Convention, (Convention Official, Wm. F. Lowe, 923 Kennedy Bldg., Tulsa, Okla.), Baker Hotel, Dallas, April 23–25;

Texas Statistical Council (Convention Official, Dr. F. A. Buechel, Bureau of Business Research, The University of Texas, Austin), Austin, April 25.

COTTON BALANCE SHEET FOR THE UNITED STATES AS OF MARCH 1

(In Thousands of Running Bales Except as Noted)

	Carryover Aug. 1	Imports to March 1*	Government Estimate as of March 1*	Total	Consumption to March 1	Exports to March 1	Total	Balance March 1
1931–1932	6,369	56	16,629	23,054	3,077	5,925	9,002	14,052
1932–1933	9,682	75	12,710	22,467	3,253	5,597	8,850	13,617
1933–1934	8,176	81	12,664	20,921	3,400	5,548	8,948	11,973
1934–1935	7,746	65	9,472	17,280	3,255	3,165	6,420	10,860
1935–1936	7,138	74	10,420	17,632	3,530	4,410	7,940	9,692
1936–1937	5,397	94	12,130	17,621	4,521	3,921	8,442	9,179
1937–1938	4,498	65	18,242	22,805	3,505	4,231	7,736	15,069
1938–1939	11,533	86	11,621	23,240	3,959	2,456	6,415	16,825
1939–1940	13,033	103	11,792	24,928	4,704	4,917	9,622	15,305
1940–1941	10,596	72	12,287	22,955	5,221	714	5,935	17,020

*In 500-pound bales.

The cotton year begins August 1.

EMPLOYMENT AND PAY ROLLS IN TEXAS

February, 1941

	Estimated Number of Workers Employed*		Percentage Change		Estimated Amount of Weekly Pay Roll		Percentage Change	
	January 1941[1]	February 1941[2]	from January 1941	from February 1940	January 1941[1]	February 1941[2]	from January 1941	from February 1940
MANUFACTURING								
All Manufacturing Industries	137,963	139,483	+ 1.1	+ 6.0	$2,696,809	$2,770,830	+ 2.7	+ 8.4
Food Products								
Baking	6,072	6,303	+ 3.8	+ 3.7	129,872	141,145	+ 8.7	+ 6.3
Carbonated Beverages	2,672	2,675	+ 0.1	+ 8.5	62,169	63,222	+ 1.7	+18.0
Confectionery	813	794	− 2.3	− 2.6	8,056	8,101	+ 0.5	+ 0.7
Flour Milling	1,827	1,838	+ 0.6	+14.7	32,751	32,971	+ 0.7	+12.2
Ice Cream	770	803	+ 4.2	+ 4.1	14,843	15,819	+ 6.6	+ 4.1
Meat Packing	4,929	4,365	−11.4	+11.3	108,299	90,024	−16.9	+ 9.5
Textiles								
Cotton Textile Mills	6,932	7,062	+ 1.9	+ 5.6	84,705	90,209	+ 6.5	+11.1
Men's Work Clothing	3,251	3,383	+ 4.1	− 4.9	32,687	36,308	+11.1	+ 9.0
Forest Products								
Furniture	1,687	1,899	+12.5	+11.0	24,907	29,686	+19.2	+20.7
Planing Mills	2,341	2,412	+ 3.0	+29.6	50,119	51,512	+ 2.8	+56.4
Saw Mills	16,584	17,026	+ 2.7	+11.7	204,178	208,192	+ 2.0	+15.4
Paper Boxes	578	597	+ 3.2	+10.6	9,939	9,244	− 7.0	+13.6
Printing and Publishing								
Commercial Printing	2,318	2,280	− 1.6	− 2.3	50,769	50,502	− 0.5	+ 2.3
Newspaper Publishing	4,701	4,850	+ 3.2	+ 2.0	116,817	121,620	+ 4.1	+ 6.5
Chemical Products								
Cotton Oil Mills	3,821	3,432	−10.2	+22.6	34,549	29,938	−13.4	+ 7.4
Petroleum Refining	19,998	20,075	+ 0.4	− 0.1	599,778	602,402	+ 0.4	− 1.0
Stone and Clay Products								
Brick and Tile	2,105	2,082	− 1.1	+20.4	25,374	25,618	+ 0.9	+38.6
Cement	822	923	+12.3	− 7.7	23,802	26,409	+11.0	+17.6
Iron and Steel Products								
Foundries and Machine Shops	10,881	11,243	+ 3.3	+ 2.4	299,658	328,156	+ 9.5	+ 8.6
Structural and Ornamental Iron	2,336	2,399	+ 2.7	+28.2	42,372	47,976	+13.2	+53.2
NONMANUFACTURING								
Crude Petroleum Poduction	29,338	29,310	− 0.1	− 4.6	974,084	958,814	− 1.6	− 2.8
Quarrying	[3]	[3]	+ 2.1	+ 7.4	[3]	[3]	+ 1.3	+ 9.6
Public Utilities	[3]	[3]	− 1.2	+ 3.2	[3]	[3]	− 1.5	+ 8.4
Retail Trade	174,670	177,857	+ 1.8	+14.2	3,182,243	3,245,644	+ 2.0	+ 8.7
Wholesale Trade	58,675	60,128	+ 2.5	+ 3.6	1,745,069	1,758,562	+ 0.8	+ 6.1
Dyeing and Cleaning	2,265	2,230	− 1.5	− 4.6	30,076	30,876	+ 2.7	− 3.7
Hotels	15,074	15,558	+ 3.2	+ 5.1	177,842	192,065	+ 8.0	+14.2
Power Laundries	10,524	10,532	+ 0.1	+11.4	133,650	130,353	− 2.5	+15.5

CHANGES IN EMPLOYMENT AND PAYROLLS IN SELECTED CITIES[4]

	Employment Percentage Change		Pay Rolls Percentage Change	
	Jan., 1941 to Feb., 1941	Feb., 1940 to Feb., 1941	Jan., 1941 to Feb., 1941	Feb., 1940 to Feb., 1941
Abilene	+ 7.2	− 2.4	+ 8.2	+ 9.9
Amarillo	− 1.7	+ 6.7	− 0.4	+11.8
Austin	+ 0.8	+ 8.6	+ 3.7	+ 4.5
Beaumont	− 1.1	+ 7.4	− 1.0	+ 9.4
Dallas	+ 1.5	+15.0	+ 4.7	+21.3
El Paso	+ 5.5	+17.0	+ 3.8	+21.2
Fort Worth	− 1.6	+ 7.4	− 2.4	+ 9.0
Galveston	− 0.9	−19.6	+ 1.0	−13.5
Houston	+ 1.6	− 1.5	+ 2.3	+ 5.9
Port Arthur	+ 1.1	− 3.9	+ 1.1	− 0.4
San Antonio	+ 2.3	+ 8.5	+ 1.4	+10.1
Sherman	+ 5.5	+ 6.0	+ 8.5	+18.7
Waco	+ 4.1	+ 0.7	+ 3.0	+14.3
Wichita Falls	− 0.4	− 0.1	− 3.6	+ 4.4
STATE	+ 0.6	+ 4.1	+ 1.3	+ 8.3

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

	1940[1]	1941
January	944,000	1,052,000
February	943,000	1,072,000[2]
March	965,000	
April	963,000	
May	983,000	
June	982,000	
July	983,000	
August	988,000	
September	1,009,000	
October	1,022,000	
November	1,048,000	
December	1,084,000	

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

[1] Revised.

[2] Subject to revision.

[3] Not available.

[4] Based on unweighted figures.

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

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

BANKING STATISTICS

(In Millions of Dollars)

	February, 1941		February, 1940		January, 1941	
	Dallas District	United States	Dallas District	United States	Dallas District	United States
DEBITS to individual accounts	$ 945	$35,612	$ 809	$30,698	$ 984	$37,846
Condition of reporting member banks on—	February 26, 1941		February 28, 1840		January 29, 1941	
ASSETS:						
Loans and investments—total	589	26,450	535	23,268	580	25,676
Loans—total	320	9,495	271	8,528	319	9,308
Commercial, industrial, and agricultural loans	221	5,227	180	4,324	219	5,076
Open market paper	1	319	2	332	2	314
Loans to brokers and dealers in securities	4	478	3	609	4	458
Other loans for purchasing or carrying securities	12	455	14	478	13	459
Real estate loans	23	1,232	22	1,185	23	1,229
Loans to banks	1	36	----	52	----	35
Other loans	58	1,748	50	1,548	58	1,737
Treasury Bills	30	727	19	647	28	685
Treasury Notes	40	2,555	44	1,735	37	2,214
U.S. Bonds	100	7,052	92	6,469	97	7,051
Obligations fully guaranteed by U.S. Gov't	38	2,766	51	2,421	39	2,744
Other securities	61	3,855	58	3,468	60	3,674
Reserve with Federal Reserve Bank	153	12,003	131	10,390	155	12,111
Cash in vault	14	530	12	480	13	527
Balances with domestic banks	300	3,473	292	3,104	281	3,352
Other assets—net	31	1,255	29	1,261	31	1,232
LIABILITIES:						
Demand deposits—adjusted	544	23,431	472	19,414	536	22,932
Time deposits	138	5,454	135	5,290	136	5,425
U.S. Government deposits	22	356	31	571	14	237
Inter-bank deposits:						
Domestic banks	289	9,253	269	8,085	280	9,076
Foreign banks	1	626	1	732	1	650
Borrowings	----	----	----	----	----	1
Other liabilities	4	755	4	692	4	754
Capital account	89	3,836	87	3,719	89	3,823

NOTE: From Federal Reserve Board.

PETROLEUM

Daily Average Production

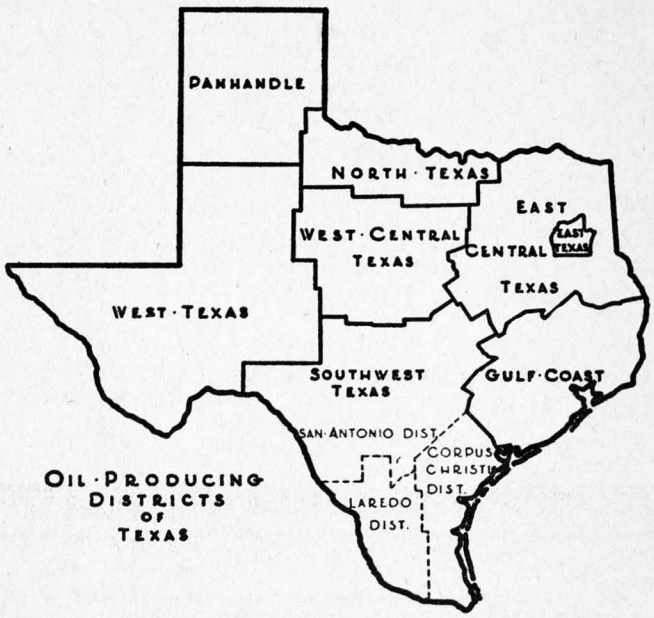
(In Barrels)

	Feb., 1941	Feb., 1940	Jan., 1941
Coastal Texas*	254,350	234,700	234,030
East Central Texas	72,550	79,000	80,240
East Texas	374,950	419,650	346,070
North Texas	100,950	101,100	98,050
Panhandle	71,300	76,350	72,380
Southwest Texas	203,450	222,900	184,100
West Central Texas	30,200	33,300	30,020
West Texas	236,050	235,700	206,230
STATE	1,343,800	1,403,700	1,251,120
UNITED STATES	3,629,400	3,734,100	3,506,560
Imports	258,107	224,586	223,114

*Includes Conroe.

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

Gasoline sales as indicated by taxes collected by the State Comptroller were: January, 1941, 120,010,000 gallons; January, 1940, 102,495,000 gallons; December, 1940, 116,430,000 gallons.



FEBRUARY RETAIL SALES OF INDEPENDENT STORES IN TEXAS

	Number of Firms Reporting	Percentage Change Feb., 1941 from Feb., 1940	Percentage Change Feb., 1941 from Jan., 1941	Percentage Change Year to date, 1941 from Year to date, 1940
TEXAS	1025	+12.1	− 4.5	+15.9
STORES GROUPED BY LINE OF GOODS CARRIED:				
APPAREL*	111	+ 6.5	− 8.2	+ 8.3
Family Clothing Stores	27	+18.9	− 8.6	+11.3
Men's and Boys' Clothing Stores	36	+14.3	−20.7	+11.0
Shoe Stores	18	+15.0	+ 9.7	+18.0
Women's Specialty Shops	29	+ 0.6	− 2.0	+ 5.3
AUTOMOTIVE*	60	+31.7	+ 2.8	+32.0
Motor Vehicle Dealers	58	+31.3	+ 2.7	+31.8
COUNTRY GENERAL	100	+ 7.2	− 4.0	+11.7
DEPARTMENT STORES	54	+ 7.2	− 3.9	+10.1
DRUG STORES	128	− 0.6	− 8.3	+ 6.0
DRY GOODS AND GENERAL MERCHANDISE	21	+19.8	+ 9.2	+ 2.6
FILLING STATIONS	37	+ 1.4	− 8.5	+ 3.5
FLORISTS	24	+ 0.2	+ 7.6	+ 1.8
FOOD*	170	+ 0.4	− 5.3	− 0.1
Grocery Stores	47	− 2.6	− 4.2	− 3.0
Grocery and Meat Stores	118	+ 1.1	− 5.7	+ 0.6
FURNITURE AND HOUSEHOLD*	54	+10.3	− 2.3	+12.6
Furniture Stores	45	+11.6	− 3.3	+13.4
Household Appliance Dealers	5	− 6.9	+10.7	− 0.6
JEWELRY	34	+40.0	− 5.1	+35.5
LUMBER, BUILDING, AND HARDWARE*	193	+10.8	−15.2	+31.4
Farm Implement Dealers	10	+10.3	+ 3.9	+21.7
Hardware Stores	61	− 1.0	− 8.0	+11.6
Lumber and Building Material Dealers	120	+14.7	−18.3	+40.5
RESTAURANTS	24	+ 0.8	− 7.0	+ 0.6
ALL OTHER STORES	15	+ 9.4	− 5.8	+12.2
TEXAS STORES GROUPED ACCORDING TO POPULATION OF CITY:				
All Stores in Cities of—				
Over 100,000 Population	187	+10.1	− 4.4	+14.1
50,000–100,000 Population	128	+23.1	− 4.8	+25.6
2,500–50,000 Population	441	+10.6	− 5.6	+14.9
Less than 2,500 Population	269	+ 3.7	+ 1.0	+ 8.1

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

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

FEBRUARY, 1941, CARLOAD MOVEMENT OF POULTRY AND EGGS

Shipments from Texas Stations

Destination*	Cars of Poultry: Live Chickens Feb. 1941	Live Chickens Feb. 1940	Live Turkeys Feb. 1941	Live Turkeys Feb. 1940	Dressed Chickens Feb. 1941	Dressed Chickens Feb. 1940	Dressed Turkeys Feb. 1941	Dressed Turkeys Feb. 1940	Cars of Eggs† Feb. 1941	Cars of Eggs† Feb. 1940‡
TOTAL	2	5	1	1	55	34	6	6	105	41
Intrastate	0	0	0	0	0	1	2	0	2	3
Interstate	2	5	1	1	55	33	4	6	103	38
Origin	Receipts at Texas Stations									
TOTAL	—	—	—	—	—	1	2	2	—	7
Intrastate	—	—	—	—	—	1	2	1	—	3
Interstate	—	—	—	—	—	0	0	1	—	4

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

†Powdered eggs and canned frozen eggs are converted to a shell egg equivalent on the following basis: 1 rail carload of powdered eggs equals 3 carloads of shell eggs, and 1 carload of frozen eggs equals 2 carloads of shell eggs.

‡Revised.

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

TEXAS CHARTERS

	February 1941	February 1940	January 1941
Domestic Corporations			
Capitalization*	$1,316	$3,010	$ 958
Number	72	126	80
Classification of new corporations:			
Banking-Finance	5	3	6
Manufacturing	8	26	13
Merchandising	12	50	20
Oil	9	14	11
Public Service	1	0	0
Real Estate-Building	10	9	7
Transportation	3	3	4
All Others	24	21	19
Numbers capitalized at less than $5,000	23	47	42
Number capitalized at $100,000 or more	1	1	2
Foreign Corporations (Number)	9	15	21

*In thousands.

NOTE: Compiled from records of the Secretary of State.

POSTAL RECEIPTS

	February 1941	February 1940	January 1941
Abilene	19,138	17,158	21,612
Austin	68,476	64,725	72,898
Beaumont	26,441	25,261	29,429
Big Spring	5,885	5,200	6,739
Brownsville	6,431	5,805	6,947
Bryan	4,777*	†	5,215*
Childress	2,223	2,272	3,070
Cleburne	2,685	1,957	2,138
Corpus Christi	28,675	26,096	36,643
Corsicana	5,840	5,220	5,982
Dallas	384,636	363,063	408,351
Del Rio	6,838	4,147	5,762
Denison	5,897	5,381	6,551
Denton	7,969	7,817	8,971
El Paso	54,461	40,956	61,212
Fort Worth	152,728	143,497	154,818
Galveston	31,395	31,318	32,354
Gladewater	2,532*	†	2,535*
Harlingen	6,456	6,364	7,055
Houston	256,874	254,170	271,666
Jacksonville	3,061	3,104	3,687
Longview	8,644	8,547	10,364
Lubbock	19,463	18,012	21,677
Lufkin	4,474	4,665	5,244
McAllen	4,963	4,834	6,438
Marshall	5,641	5,952	6,589
Palestine	4,996	5,254	6,651
Pampa	6,089	6,909	6,786
Paris	6,552*	†	6,706*
Plainview	4,032	3,769	4,241
Port Arthur	12,829	12,782	14,603
San Angelo	12,150	11,156	13,312
San Antonio	135,080	122,887	145,688
Sherman	7,311	7,249	8,086
Snyder	1,460	1,456	1,624
Sweetwater	4,387	4,505	5,558
Tyler	14,414	15,421	17,284
Waco	31,609	30,787	37,981
Wichita Falls	22,229	21,481	26,371
TOTAL	1,475,880	1,299,177	1,484,382

*Not included in total.

†Not available.

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

COMMODITY PRICES

	Feb. 1941	Feb. 1940	Jan. 1941
Wholesale Prices:			
U.S. Bureau of Labor Statistics (1926=100%)	80.6	78.7	80.8
Farm Prices:			
U.S. Department of Agriculture (1910–14=100%)	103.0*	101.0	104.0
U.S. Bureau of Labor Statistics (1926=100%)	70.3	68.7	71.6
Retail Prices			
Food (U.S. Bureau of Labor Statistics 1935–39=100%)	97.9	96.6	97.8
Department Stores (Fairchilds Publications, Jan. 1931=100%)	94.5	92.6	94.2

*Preliminary.

FEBRUARY RETAIL SALES OF INDEPENDENT STORES IN TEXAS

	Number of Firms Reporting	Percentage Change in Dollar Sales Feb., 1941 from Feb., 1940	Feb., 1941 from Jan., 1941
TOTAL TEXAS	1,025	+12.1	− 4.5
TEXAS STORES GROUPED BY PRODUCING AREAS:			
District 1–N	62	+ 5.2	− 1.8
Amarillo	11	+ 9.6	− 3.8
Canyon	7	−10.9	−14.6
Pampa	8	+ 4.5	+ 1.0
Plainview	11	+ 8.3	−11.7
All Others	25	+ 1.0	+ 4.4
District 1–S	18	−23.6	−24.6
Lubbock	6	−23.2	−26.8
All Others	12	−24.7	−19.0
District 2	88	+ 1.8	+ 3.9
Abilene	13	+49.1	− 4.0
Wichita Falls	18	− 1.9	+ 3.2
All Others	57	−13.3	− 9.8
District 3	38	+37.6	− 8.0
Breckenridge	6	− 2.3	− 9.4
All Others	32	+40.8	− 7.9
District 4	229	+ 9.7	− 3.0
Cleburne	8	− 4.4	− 9.2
Corsicana	7	+13.2	+ 9.5
Dallas	41	+ 7.7	+ 0.7
Denison	8	− 2.9	−32.1
Fort Worth	37	+10.8	− 9.4
Taylor	6	+23.1	− 5.7
Temple	7	+ 9.7	− 3.6
Waco	27	− 0.4	− 9.7
All Others	88	+31.8	+ 6.4
District 5	105	+15.6	− 3.8
Bryan	5	− 2.4	− 5.7
Henderson	5	+40.0	−12.6
Longview	5	+45.0	+16.0
Marshall	7	+ 8.3	− 4.3
Texarkana	5	+13.4	+11.4
Tyler	12	+ 8.0	−19.3
All Others	66	+14.2	− 0.9
District 6	34	+44.2	+ 0.3
El Paso	21	+49.0	+ 0.5
All Others	13	− 5.8	− 2.5
District 7	58	+ 7.7	−11.9
Brady	6	− 3.3	+11.3
Fredericksburg	9	+17.9	−10.9
San Angelo	13	+11.2	−20.7
All Others	30	+ 2.8	− 1.7
District 8	187	+13.4	− 4.8
Austin	23	+10.7	−17.3
Corpus Christi	10	+ 7.5	+ 1.0
Lockhart	8	+38.5	+ 2.2
San Antonio	56	+15.5	− 3.4
San Marcos	8	+ 0.2	−15.1
All Others	82	+ 7.2	+ 5.5
District 9	147	+10.9	− 6.3
Bay City	6	+67.2	− 7.1
Beaumont	21	+ 4.6	− 2.2
Galveston	15	+37.6	− 0.5
Houston	53	+ 9.1	− 8.5
Port Arthur	14	+ 6.9	−10.0
Victoria	6	−13.9	− 4.5
All Others	32	+ 9.8	+10.2
District 10	69	− 9.3	− 4.7
Brownsville	9	+ 0.9	+ 0.7
Harlingen	5	+17.1	− 3.6
All Others	45	−14.5	− 6.5

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

FEBRUARY CREDIT RATIOS IN TEXAS RETAIL STORES

(Expressed in Per Cent)

	Number of Stores Reporting	Ratio of Credit Sales to Net Sales		Ratio of Collections to Outstandings		Ratio of Credit Salaries to Credit Sales	
		1941	1940	1941	1940	1941	1940
All Stores	66	65.8	67.3	39.7	39.5	1.2	1.2
Stores Grouped by Cities:							
Abilene	3	49.7	62.7	36.7	32.3	1.8	2.6
Austin	6	59.2	60.1	45.7	44.8	1.4	1.5
Dallas	10	72.8	73.6	41.8	42.8	0.8	0.8
El Paso	3	57.1	58.2	37.0	36.0	1.1	1.2
Fort Worth	6	64.3	66.6	35.7	35.8	1.5	1.3
Houston	8	64.8	65.8	40.7	39.5	1.6	1.7
San Antonio	5	48.4	52.3	43.6	43.4	2.4	1.8
Waco	5	64.4	65.1	30.2	28.4	1.6	1.7
All Others	20	62.7	63.3	38.4	36.8	1.8	1.9
Stores Grouped According to Type of Store:							
Department Stores (Annual Volume Over $500,000)	20	66.0	67.1	40.5	41.3	1.1	1.2
Department Stores (Annual Volume under $500,000)	11	59.0	62.2	36.4	31.9	2.1	2.3
Dry-Goods-Apparel Stores	5	51.5	64.4	36.8	39.4	2.9	2.2
Women's Specialty Shops	14	67.2	68.8	38.8	35.6	0.8	0.7
Men's Clothing Stores	16	66.8	67.6	37.8	39.3	1.7	2.0
Stores Grouped According to Volume of Net Sales During 1940:							
Over $2,500,000	9	69.2	69.4	40.7	39.6	1.0	0.9
$2,500,000 down to $1,000,000	11	60.0	62.3	42.0	40.4	1.2	1.4
$1,000,000 down to $500,000	10	59.6	59.9	40.5	38.9	1.7	1.9
$500,000 down to $100,000	28	51.5	59.8	37.6	37.3	1.7	2.3
Less than $100,000	8	55.3	52.4	36.5	30.6	5.1	4.5

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

CEMENT

(In Thousands of Barrels)

	Feb. 1941	Feb. 1940	Jan. 1941
Texas Plants			
Production	637	477	654
Shipments	628	533	793
Stocks	773	850	764
United States			
Production	8,365	5,041	9,025
Shipments	7,458	4,905	7,986
Stocks	25,327	25,895	24,420
Capacity Operated	43.5%	24.7%	42.4%

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

LUMBER

(In Board Feet)

	Feb., 1941	Feb., 1940	Jan., 1941
Southern Pine Mills:			
Average Weekly Production per unit	319,633	271,025	325,918
Average Weekly Shipments per unit	336,450	240,668	340,522
Average Unfilled Orders per unit, end of month	1,031,150	673,697	1,041,316

NOTE: From Southern Pine Association.

PERCENTAGE CHANGES IN CONSUMPTION OF ELECTRIC POWER

	Feb., 1941 from Feb., 1940	Feb., 1941 from Jan., 1941
Commercial	+ 9.9	− 4.4
Industrial	+10.4	− 1.9
Residential	+ 9.6	− 7.8
All Other	+ 3.0	− 4.0
TOTAL	+ 9.2	− 3.8

Prepared from reports from 12 electric power companies to the Bureau of Business Research.

TEXAS COMMERCIAL FAILURES

	Feb. 1941	Feb. 1940	Jan.* 1941
Number	27	18	37
Liabilities†	$351	$182	$372
Assets†	205	116	186
Average Liabilities per Failure†	13	10	10

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

BUILDING PERMITS

	February 1941	February 1940	January 1941
Abilene	55,753	26,160	74,860
Amarillo	197,525	137,791	173,960
Austin	769,188	750,229	392,158
Beaumont	88,453	128,488	307,310
Big Spring	7,245	6,600*	12,630
Bryan	30,535†	‡	18,910†
Coleman	7,200†	‡	20,740*†
Corpus Christi	1,455,958	1,405,942	1,202,464
Corsicana	8,475	13,632	31,550
Dallas	971,557	1,129,982	1,048,691
Denton	11,750	5,800	18,375
El Paso	285,782	173,722	223,032
Fort Worth	350,659	494,902	500,882
Galveston	96,795	153,080	111,030
Gladewater	3,800	524	0
Harlingen	27,100	29,335	13,800
Houston	1,116,640	1,322,470*	2,004,075
Jacksonville	10,400	1,700	11,400
Kenedy	4,200	2,500	300
Longview	11,800	12,700	3,950
Lubbock	380,263	312,469	211,971
Lufkin	23,513	36,072	24,266
McAllen	25,016	51,962	8,004
Marshall	28,548	11,725*	63,660
Midland	50,715	95,565	17,825
Palestine	17,736	11,956	9,026
Pampa	16,500	20,300	31,750
Paris	16,050	12,075	7,475
Plainview	3,475	2,215	3,800
Port Arthur	106,428	87,535	84,416
San Angelo	56,057	38,246	66,000
San Antonio	379,362	432,371	1,083,086
Sherman	28,751	23,795	8,273
Sweetwater	18,140	8,385	10,985
Tyler	43,528	45,346	46,065
Waco	151,566	81,413	165,085
Wichita Falls	81,120	42,987	58,125
TOTAL	6,899,848	7,109,974	8,030,280

*Does not include public works.
†Not included in total.
‡Not available.
NOTE: Compiled from reports from Texas chambers of commerce to the Bureau of Business Research.

PURCHASES OF SAVINGS BONDS

	Feb., 1941	Feb., 1940	Year-to-date, 1941	Year-to-date, 1940
Amarillo	83,512	34,369	139,837	115,069
Austin	108,113	53,119	242,513	166,238
Beaumont	97,594	59,860	157,662	193,623
Big Spring	7,369	24,225	26,063	52,650
Brownsville	2,325	9,975	†	23,963*
Bryan	18,788*	†	†	†
Corpus Christi	26,663	55,631	60,976*	†
Dallas	549,825	258,769	1,091,344	821,363
Del Rio	881	2,306	5,569	9,900
Denison	6,581	14,663	15,975	50,232
Denton	2,758	983	15,639	12,777
El Paso	192,863	92,100	287,119	306,469
Fort Worth	233,138	128,306	432,076	185,171
Galveston	126,956	52,481	229,069	137,156
Gladewater	12,131	6,469	45,562	57,882
Harlingen	5,456	4,181	10,275	17,081
Kilgore	27,825	18,356	49,500	25,612
Longview	36,019	36,356	104,325	89,381
McAllen	13,331	10,781	20,550	22,312
Marshall	16,556	58,106	53,474	102,937
Palestine	47,231	6,900	52,069	34,219
Pampa	12,038	1,425	15,507	9,338
Paris	4,125*	†	21,450*	†
Plainview	2,700	900	8,568	19,931
Port Arthur	55,350	21,244	76,388	80,775
San Angelo	32,663	8,569	70,144	54,619
San Antonio	347,625	174,919	642,975	644,194
Sherman	2,873	9,544	14,648	33,544
Temple	13,762	20,963	20,474	23,063
Tyler	47,513	23,006	158,551	152,231
Waco	62,081	168,544	155,231	290,044
Wichita Falls	19,893	94,463	125,494	216,301
TOTAL	2,193,626	1,451,513	4,266,601	3,924,112

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

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

	Cattle		Calves		Hogs		Sheep		Total	
	1941	1940	1941	1940	1941	1940	1941	1940	1941	1940
Total Interstate Plus Fort Worth¶	2,110	2,041	691	629	782	592	218	400	3,801	3,661
Total Intrastate Omitting Fort Worth	203	301	130	124	18	26	†	20	351	471
TOTAL SHIPMENTS	2,313	2,342	821	753	800	618	218	420	4,152	4,132

TEXAS CAR-LOT* SHIPMENTS OF LIVE STOCK, JAN 1–MARCH 1

	Cattle		Calves		Hogs		Sheep		Total	
	1941	1940	1941	1940	1941	1940	1941	1940	1941	1940
Total Interstate Plus Fort Worth¶	4,722	4,803	1,621	1,476	1,783	1,262	581	810	8,707	8,351
Total Intrastate Omitting Fort Worth	413	642	282	195	35	47	14	41	744	925
TOTAL SHIPMENTS	5,135	5,445	1,903	1,671	1,818	1,309	595	851	9,451	9,276

*Rail-car Basis: Cattle, 30 head per car; calves, 60; hogs, 80; and sheep, 250.
†Less than one-half of a carload.
Fort Worth shipments are combined with interstate forwardings in order that the bulk of market disappearance for the month may be shown.
NOTE: These data are furnished the Agricultural Marketing Service, U.S.D.A. by railway officials through more than 1,500 station agents, representing every live stock shipping point in the State. The data are compiled by the Bureau of Business Research.

LIST OF PUBLICATIONS

PRINTED BULLETINS

The Basis of the Commercial and Industrial Development of Texas, by Elmer H. Johnson. Price $2.00

Natural Regions of Texas, Elmer H. Johnson. Price $1.00

Directory of Texas Manufacturers, 1940 Edition, by F. A. Buechel and Clara H. Lewis, assisted by Carrol Brown and Edward Dedeke. Price $2.00

Eight Years of Livestock Shipments in Texas, 1925–1932, Part I, Cattle and Calves, by F. A. Buechel. Price $1.00; Supplement to Part I, 1933–1939, by F. A. Buechel. Price $1.00; Part II Hogs and Sheep, 1925–1939, by F. A. Buechel. Price $1.00

A System of Accounting Procedure for Livestock Ranches, by F. W. Woodbridge. Price $1.50

Methods for the Study of Retail Relationships, by William J. Reilly. Price $1.00

What Place Has the Advertising Agency in Market Research, by William J. Reilly. Price $1.00

MIMEOGRAPHED BULLETINS

Studies of Employment Problems in Texas, by A. B. Cox. Price $1.00

Manufacture of Dairy Products in Texas, by F. A. Buechel and Elmer H. Johnson. Price $1.00

Farm Cash Income in Texas, 1927–1938, by F. A. Buechel and Elmer H. Johnson. Price $1.00

MONTHLY PUBLICATIONS

Texas Business Review. Price $1.00 per year
New Passenger Car Registration in Texas. Price $2.00 per year
New Commercial Car Registration in Texas. Price $1.50 per year

CONTENTS