

## The Texas Economy: New Forces

BY STANLEY A. ARBINGAST

For the past six decades, Texas has been in a process of explosive growth. Since 1900 population has more than tripled, from slightly over 3,000,000 to 10,300,000. The key factors in this growth have been the wide diversity of raw materials available for industry and man's recognition of their value as resources. But in 1965, because many of the nation's dynamic new industries are not oriented to raw materials, the people of Texas need to take a new and searching look at those resources which have been the major basis for economic development, for there is already evidence that as a growth factor raw materials are declining in relative importance. For example, outbound shipments of commodities, such as lumber, oil, cotton, and sulfur, no longer contribute anything like as great a share of the state's income as they did formerly.

Since frontier times, Texans have been extractors. Some plowed and planted large acreages of land and harvested crops, and some pastured livestock. Some cut trees. Others dug deep for solid minerals, such as stone, and later many others dug much deeper for oil and gas. And, then, by and large, they shipped out the goods they had extracted, and they returned to the earth for more.

The extractive days are far from done; they never will be. But today industries based on materials extracted from the earth—agriculture, forestry, fishing, and mining—use almost as many machines as workers, and many workers who were employed in these occupations are now busied with reshaping goods in factories and moving those goods to the consumer rather than in producing raw materials. Mechanization of agriculture, forestry, and mining released many dwellers in rural areas for work in urban communities, but, fortu-

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nately, this displacement paralleled an increasing demand for factory employees. In 1939 farm employment accounted for 46.9 per cent of the labor force, but in July 1964 only about 9.5 per cent of the labor force were employed in agriculture. Employment in forestry and mining has declined, too, but not so radically.

Raw materials on which most Texas industry is based can be divided conveniently into three categories: earth materials, plant and animal materials, and industrial intermediates.

The earth materials include petroleum, natural gas, helium, sulfur, limestone, oyster shell, aggregates, dimension stones, cement and gypsum materials, salt and salt brines, lignite, glass sands, vermiculite, uranium, barite, and talc, among many others. It is this group of resources in great demand by modern industry, either as sources of energy or as raw materials, which has contributed the most to recent industrial growth in Texas, but these resources are exhaustible, and it seems likely that only a few new discoveries of large deposits of them will be made. The effect of new technological developments on mineral commodities, particularly those which are sources of energy, affect demand and supply conditions. For example, the community of Thurber in Erath County was once a city of 6,000 inhabitants where most of the labor force made their living as coal miners. After the discovery and use of petroleum and gas as suppliers of energy, Thurber lapsed into obscurity<sup>1</sup> with only a monument as a reminder of its economic importance in the early 1900's.

Plant and animal raw materials are available in great variety and quantity from the state's forests and farms, and from the ocean. Among the most important are timber, wool, mohair, cotton, corn, grain sorghums, other cereal grains (among them, rice, wheat, oats, and barley), sugar beets, citrus and other fruits, peanuts, pecans, castor beans, vegetables, flax, fish, and livestock and poultry products, such as meat, eggs, and milk. Ironically, technology has helped to increase the supply of cotton at a time when there has been a decrease in demand because of the development of substitute fibers derived from Texas oil and gas. Demand for wool and mohair has also decreased because of the development of Texas-based substitute fibers. What is even more ironic, Texas is the leading state in the production of cotton, wool, mohair, and the chemical intermediates

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<sup>1</sup> In 1960, according to the *Texas Almanac*, Thurber had two inhabitants.

used to manufacture synthetic fibers, all of them competing for the same market.

Comprising the third group are industrial intermediates made or processed in Texas plants which in turn often become the raw materials for other factories. Steel, copper ingot, alumina, aluminum pig and extrusion ingot, cottonseed oil, sugar, refinery gases, sulfuric acid, propylene, ethylene, butadiene, styrene, bromine, ammonia, chlorine, caustic soda and soda ash, carbon black, synthetic rubber, rocket fuels and rocket engines, wood pulp, paperboard, newsprint, sawed lumber, plywood, portland cement, cotton textiles, aircraft components, tin, lead, lime, ferroalloys, and many other products, particularly other chemicals. Availability of these industrial intermediates is of special importance to additional expansion of the manufacturing base, especially to expansion of the number of factories with market-orientation. As an illustration, availability of chlorine, soda ash, and caustic soda derived from Texas oyster shell and salt at what is now the plant of the Chemicals Division of Pittsburgh Plate Glass at Corpus Christi was an important attractive factor when decisions were made to construct such factories as those of Owens-Illinois Glass at Waco and Champion Paper and Fibre at Pasadena.

People are a resource, too; in fact, they are the most important of all resources. They serve as extractors, but also as managers, manufacturers and transporters, and as servicers of machines. In fact, it is human imagination acting upon resources that gives rise to manufacturing and to improvements in techniques of servicing the needs of the population. The imagination may be that of the manufacturer, who designs and fashions a useful or attractive product, or it may be that of the consumer, who decides he wants something he has never had or of which he has not had enough to satisfy his wants. In either case, it takes people to be the consumers. It takes a number of people to be the entrepreneurs and to do the manufacturing and transporting. It takes raw materials, and it takes capital to finance buildings, machines, and other equipment.

Most of the recent shift from overwhelming dependence on raw materials-oriented industry to greater emphasis on output of consumer goods for local and regional markets has been financed by Texas capital. Companies such as Texas Instruments, Texas Industries, Lone Star Brewing Company, Ling-Temco-Vought, Hicks-

Ponder, Structural Metals, Inc., Frito-Lay, Haggar, Williamson-Dickie, Reed Roller Bit, Kilgore Ceramics, and Nichols Industries are owned and operated for the most part by Texans. Some Texas banks and insurance companies and some Texas-based manufacturing companies are now among the nation's largest.

Oil and gas are no longer quite as attractive to the large investor for speculation, and small investors have been discouraged by the ever-increasing cost of petroleum exploration and the declining prospects for success. Too, agriculture, because of low and erratic returns, is unattractive for investment to many.<sup>2</sup> Because oil and agriculture have decreased drawing power for investment, entrepreneurs are turning to growth industries—particularly to those which are developing in response to the expansion of local and regional markets and to those which are developing as a result of technological advances, *i.e.* electrical machinery.

It is apparent, then, that new economic forces not based to great degree on raw materials availability are beginning to come into play, and it is these new forces which will control the direction of the Texas economy. The takeoff point of a new era has been reached; the resources of Texas agriculture and Texas minerals are still of great importance, but relatively less so.

New interrelationships between extractors, manufacturers, and marketers are developing. Illustrative of these new interrelationships is the trend for chain grocers when they reach a certain size to buy local manufacturing plants or to contract with food processors to manufacture for distribution not under the processor's label but under the chain's label. The influence of Dallas wholesale and retail establishments on the choice of a Dallas location for fashion-goods manufacturing is illustrative of new trends, too.

Another developing interrelationship is the feedback of technology by manufacturers to producers. Wood processors have sponsored the expansion of tree farming in East Texas; meat packers set specifications for livestock and poultry they buy; Campbell Soup Company, with a new plant at Paris on the Red River, is ready to offer technical aids to farmers who produce the vegetables for the factory. This

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<sup>2</sup> In 1961, according to the U. S. Department of Agriculture, the average cotton farm in the Texas Blacklands returned only \$3.93 for every \$100 invested. In effect Blacklands' farmers were earning an hourly wage rate of only \$0.59. See U. S. Department of Agriculture, *Farm Costs and Returns, Agriculture Information Bulletin Number 230*, revised October 1962.

trend means that efficiency of production by primary producers is increased.

There is also the centripetal tendency of markets to be self-reinforcing. Farmers and small-town residents move to the city. Approximately 75 per cent of the Texas population is now concentrated in communities of 2,500 or more, and between 1950 and 1960 well over half of the 254 Texas counties lost population even though the increase in number of inhabitants for the state as a whole was substantial. As a city grows, it offers expanded facilities for retail trade, cultural and recreational activities, and for medical and other specialized services. It attracts more trade and more migrants from rural areas. There is increased emphasis on distributive and service industries because of specialization. External factors, such as the improvement of transportation, reinforce the centripetal tendency as does the spread of mass media to a more sophisticated market, helping to create specialized wants which often cannot be met by retail stores and service industries in small towns.

There can be no change in direction of the economy of the state, however, without serious lags in social adjustment or what the late E. W. Zimmermann<sup>3</sup> referred to as resistances; and in Texas these resistances are numerous. Training for service and distribution workers is clearly inadequate. These are low-wage industries, and managers seem to be willing to put up with substandard performance rather than to pay for a job better done. Upgrading capabilities of unskilled and semiskilled workers is often resisted by the underqualified, many of whom are semiliterate or illiterate. Application of technological advances to certain activities lags because of organized opposition of workers to change and to competition from machines. Unemployment rates are critically high among minority groups and in rural areas where there is overpopulation because work opportunities have declined. Many persons, particularly older people, are reluctant to leave rural areas and small towns to become urban dwellers. As farms become more efficient and transportation facilities improve, there are fewer reasons for many small towns to exist.

Problems of adjustment by cities in order to assimilate the influx of thousands of new residents are staggering. Educators are hampered by lack of funds sufficient to cope with rising enrollments and the

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<sup>3</sup> For many years until his death in 1960, Professor of Resources at The University of Texas.

need of modern industry for employees trained in new skills and techniques which have not heretofore been included in the curriculum. Even though it is recognized that there is less and less demand for laborers devoid of skill other than muscle power, training them to cope with the complexities of modern industry takes money, and the taxpayer has to foot the bill.

The major population increase in Texas to a great degree is due to a high birth rate; contrary to popular opinion, outmigration almost equals immigration. This high birth rate means that an ever larger number enters the labor force every year at a time when employment is tending to stabilize in some industries and decline in others because of automation. In some states total manufacturing employment is declining; in Texas it is still increasing because of new factories which are for the most part market-oriented rather than resource-oriented.

Competition of new industries among the states grows more intense each year. Location of the dynamic industries of the sixties, such as research, electronics, and aerospace, is not strongly influenced by the availability of natural resources. To compete, Texas must place less dependence on natural resources and more dependence on a skilled and educated labor force. Texas citizens must understand the challenge and use wisdom and foresight if economic growth is to continue.