

August 11, 1939

To the Committee on Graduate Study:

I am submitting to you a thesis written by Victor Albert Hyde entitled "A Geographical Survey of Knoxville, Tennessee." I recommend that it be accepted for eighteen quarter hours credit in partial fulfillment of the requirements for the degree of Master of Science, with a major in Geography.

H.C. Amick

Major Professor

We have read this thesis
and recommend its acceptance:

George M. Hall

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Accepted for the Committee

H.C. Amick

Dean of the Graduate School

**A GEOGRAPHICAL SURVEY OF
KNOXVILLE, TENNESSEE**

-0-

A THESIS

**Submitted to
the Committee on Graduate Study
of
The University of Tennessee
in
Partial Fulfillment of the Requirements
for the degree of
Master of Science**

by

Victor Albert Hyde

August 1939

ACKNOWLEDGMENTS

In developing this project, I have been particularly indebted to Professor H. C. Amick, who suggested the problem originally, and whose active assistance and constructive criticisms have proved indispensable. I am grateful to Dr. G. M. Hall and Dr. C. Rappenecker for their interest and suggestions in the correction of the manuscript of this paper. Thanks are due also to Miss Jane Akers of the Knoxville Bureau of Recreation, Mr. F. D. Jones of the Knoxville Housing Authority, Mr. J. S. Johnston of the Knoxville Real Property Survey, Mr. F. A. Roberts, Secretary, Knoxville Chamber of Commerce, Mr. J. E. Brownlow, and Miss Beth Cheney for her work in typing this thesis.

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DEPARTMENT OF THE INTERIOR
FRANKLIN K. LANE, SECRETARY
U.S. GEOLOGICAL SURVEY
GEORGE OTIS SMITH, DIRECTOR

Scale numbers

Edition of 1916.

CHAPTER I

LOCATION AND EARLY HISTORY

I. Location

The city of Knoxville is located approximately 83°55' West Longitude and 35°58' North Latitude. It is the second largest city in East Tennessee, the fourth largest city in the state. The city is situated near the center of the Great Valley of East Tennessee, which extends from southwest Virginia to northwest Georgia, and forms part of a great natural highway extending from New York to Alabama.¹ This Valley is one of the beautiful and prosperous valleys of the United States. The Valley is bounded on the southeast by the Unaka Chain of Mountains and on the northwest by the Cumberland Plateau.

In 1926, The United States Department of Commerce, in its Commercial Survey of the Southeast, said of Knoxville:

Knoxville, situated in the center of the upper valley of Tennessee, grew up as a strategic distributing center for that area. The fertile valleys comprising its territory, watered by the many streams pouring into the Tennessee River, constituted from the first a grain and livestock area which still finds its principal market in the cotton belt. Thus the history of Knoxville was primarily that of a trading center, but in recent years use has been made of the raw products of coal, iron, copper, marble, zinc, and miscellaneous minerals in fostering industrial development. Knoxville has

1. Bartholomew, Harland, and Associates, A Comprehensive City Plan for Knoxville, (Knoxville: Knoxville City Planning Commission, 1930), p. 19.

become an important center for the manufacture of knit goods, and industrial expansion is likely to be accelerated with development of the potential waterpower resources centering there.²

II. Early History

The city, named in honor of General Henry Knox, the Secretary of War in President Washington's Cabinet, developed from a small log cabin erected on the west side of First Creek at a site which is today the northeast corner of Clinch Avenue and State Street. The forerunner of the city was White's Fort on the Indian frontier which was founded by James White, a pioneer from North Carolina.³ The first year (1786) was particularly favorable for growth, with comparative freedom from Indian incursions and outrages as a result of the concession made by the Hopewell Treaty,⁴ which was negotiated in the latter part of November, 1785.

In 1789, North Carolina, as payment of all obligations incurred in the Revolutionary War, which were to be assumed by the general government, ceded to the United States all right and title to the Tennessee country.⁵

2. Hager, John M., "Commercial Survey of the Southeast," U. S. Department of Commerce, Domestic Commerce Series, U. S. Gov't. Printing Office, Washington, 1927, p. 142.

3. Rule, W., Mellon, F. G., and Wooldrige, J., Standard History of Knoxville, Tennessee, (Chicago: Lewis Publishing Company, 1900), p. 37.

4. Ibid., p. 35.

5. Ibid., p. 42.

On June 8, 1790, President Washington appointed William Blount governor of the "Territory of the United States South of the River Ohio." One of the first moves on the part of the new governor was an attempt to gain the friendship and confidence of the Cherokees. He called a council of the chiefs and head men of the tribe, which meeting took place where the First Creek enters the Tennessee River near the foot of Central Street on October 26, 1791. As an outcome of this meeting, the Treaty of the Holston was obtained which was a statement of peace and friendship between the Indians and the whites. However, the one significant clause in the treaty extinguished all Indian claims to land in the vicinity of Knoxville.

The original town consisted of sixteen blocks, being bounded on the North by Church Street, on the South by Front Street, on the West by Crooked Street (now Walnut Street), and on the East by First Creek. The first lots were laid out in 1791, although 1792 is often considered the date of founding, yet the seal of the City of Knoxville carries the date 1794. Haywood and Ramsey, commenting on the early history of Knoxville, contradict themselves in regard to the date of the founding of Knoxville. Haywood, in referring to the Knoxville Gazette, calls attention to

the name and date of the paper alleging, "Knoxville was not laid off till February, 1792."⁶ Farther on he cites an act of the territorial legislature establishing Knoxville, in which he says, "... which had been laid off by Colonel James White in the year 1791,"⁷ Ramsey, in speaking of the Gazette says, "In February of the next year (1792) Knoxville was laid off by Colonel White," yet farther on he says, "... some of the lots were sold in 1791, but no considerable improvement was commenced until February of 1792, when several small buildings were erected."⁸

As to who actually laid out the town, brings up another controversy. The majority of writers⁹ give credit

6. Haywood, John, The Civil and Political History of the State of Tennessee, Exact reprint of edition of 1823. Publishing House of the Methodist Episcopal Church, South. Barbee and Smith, Agents, Nashville, 1891, p. 272.

7. Ibid., p. 336.

8. Ramsey, J. G. M., Ramsey's Annals of Tennessee and Fain's Index, J. Russel, Charleston, 1853, p. 558.

9. Ibid., p. 558.

9. Haywood, John, loc. cit.

9. Phelan, James, History of Tennessee; The Making of a State (New York: Houghton-Mifflin and Company, 1888), p. 149.

9. Hamer, P. M., Tennessee, A History, (New York: The American Historical Society, Inc., 1933), Vol. I, p. 774.

9. Parish, W. H. Publishing Company, Art Work of Knoxville, (Knoxville: W. H. Parish Publishing Company, 1895), p. 3.

to Colonel James White, but in several other works¹⁰ Colonel Charles McClung is credited with having surveyed and laid out the town.

Knoxville became the seat of the Tennessee territorial government, and when the territory became a state, in 1796, it became the capital city. In 1811, the capital was moved to Kingston for one day, then back to Knoxville, then to Murfreesboro, and to Nashville, but in 1817, Knoxville was again made the center of government for a short period. From this humble beginning developed one of the great cities of the South. Unlike so many cities below the Mason-Dixon line, Knoxville represents a transitional type of city between the typical Northern and Southern city types. From a mere hamlet consisting of 2,676 persons in 1850, the city has developed steadily until at the present time the City Directory lists 170,153 inhabitants.¹¹

10. Heiskell, S. G., Andrew Jackson and Early Tennessee History, (Nashville: Ambrose Printing Company, 1918), p. 47.

10. Knoxville Chamber of Commerce, Outline of Knoxville's Early History, (Knoxville: Knoxville Chamber of Commerce, 1938), one page mimeographed material.

11. City Directory Company of Knoxville, Knoxville City Directory, 1939, (Knoxville: City Directory Company of Knoxville), p. 3.

CHAPTER II

POPULATION GROWTH¹

The study of the population growth of Knoxville must not be limited to an analysis of the city itself, as Knoxville has always constituted a considerable portion of the population included within the county statistics. Furthermore, city population figures were not returned separately prior to 1850 which would tend to distort the true picture of growth in the city's early development. (See charts at the end of chapter).

The first Federal Census report of 1800 for Knox County shows a total population of 12,446, of which the whites made up 11,129 and the negroes 1,317. Although a contrast cannot be made with any preceding census, it is of interest to note that this one shows that the percentage of negroes in Knox County was the lowest in history, being only 10.6 per cent. From 1800 to 1810 there was a decrease in the total county population of 2,275 persons. Of this decrease all but 22 were white, thus reducing the percentage of white population in the county from 89.4 per cent in 1800 to 87.3 in 1810.

1. Unless otherwise stated, all statistics given are by the Department of Commerce, Bureau of the Census, Federal Decennial Censuses.

During the period from 1810 to 1820, the county population increased over the previous census by 27.18 per cent, an increase of 2,363 persons over the census of 1810. Of this increase the whites represented 2,250, and the negroes 613. Even with the small numerical increase of negroes, their percentage of the total population increased 1.9 per cent to make up 14.6 per cent of the total population.

In the decade from 1820 to 1830, the county population continued to rise, and showed an increase of 11.23 per cent. Of the increase of 1,464, the whites represented 1,231. Even the small 1.6 per cent population increase of the negroes raised their percentage of the total population to 14.7 per cent. This percentage marked the greatest proportion of negroes in Knox County during the entire period from 1800 to 1870.

The census figures for the years from 1830 to 1840 show that although the population tended to increase it did so at a decreasing rate. The rate for total population increase was 6.8 per cent compared to 11.23 per cent in the previous decade. A numerical decrease in the negro population of 34 persons is also noted. This decade is the last one to show such a numerical decrease in the negro population.

From 1840 to 1850, the county population again increased quite rapidly, showing a growth of 21.52 per cent over the previous census. Of this increase only 259 were negroes, thus reducing the percentage of negroes to 13.0 per cent of the total county population. In 1850, the first Federal Census was taken for the city of Knoxville, and reported a population of 2,076 inhabitants. This was 11.04 per cent of the total county population, the lowest percentage shown to date for the city. The 1850 census further shows that the percentage of whites in the county population was 87 per cent, and in the city 71.2 per cent; the negroes 13 per cent and 28.2 per cent respectively.

The period from 1850 to 1860 was one of marked confusion, and during this period only county statistics are available. During this decade the county population continued its upward swing from 1840 with an increase of 21.3 per cent or 4,006 persons. Of this increase, 3,635 were whites which raised the percentage of the white population to 87.5 per cent of the total county population. This percentage was the highest ever shown by the white group from 1810 to 1920.

The county population from 1860 to 1870 increased 27.08 per cent, representing an increase of 6,177 people.

Of this increase 2,047 were negroes pushing their percentage of the total population to 16.7 per cent. As no figures are given for the year 1860 for the city of Knoxville, the percentages and figures may be misleading when taken over the twenty-year period from 1850 to 1870. Knoxville increased from 2,076 in 1850 to 8,632 in 1870, an increase of 318.5 per cent over the twenty-year period. Of this population, 70 per cent constituted whites, while for the county the white population represented 83.3 per cent.

From 1870 to 1880 the growth of the county population was much greater than that for the city of Knoxville. The county statistics show an increase of 34.96 per cent or 10,134 persons, while the city itself increased by only 1,011 representing a population increase of 11.7 per cent. During this period the percentage of negroes in both the city and county increased, the county showing an increase of 1.8 per cent, and the city an increase of 2.5 per cent.

During the period from 1880 to 1890 the population in both the city and the county increased the greatest percentage to date. The city population increased from 9,693 in 1880 to 22,535 in 1890, representing an increase of 132.9 per cent. The county registered an increase of 20,433 persons or an increase of 52.3 per cent. It should

be noted that the percentage of negroes in the city definitely decreased by four per cent, while the percentage of negroes in the county remained constant.

From 1890 to 1900 the population increase in both the city and the county levelled off. The city showed an increase of 45.0 per cent, and the county 24.76 per cent. Of this increase the whites in both the city and the county constituted the greater percentage, thus increasing the whites in the city to 77.5 per cent (an increase of 6 per cent from the 1890 census), and the percentage of whites in the county to 84.2 per cent (2.7 per cent increase).

The decade from 1900 to 1910 showed a marked decline in the rate of population growth of Knoxville, represented by an increase of 11.35 per cent. The county rate of growth however, remained more or less constant as represented by a 26.76 increase over the 1900 census which showed an increase of 24.76 per cent.

From 1910 to 1920 the population growth of the city itself showed a remarkable increase, while the county statistics show a decrease in the percentage of population increase from the 1910 census of 6.86 per cent. During this period Knoxville boasted of an increase of 114.1 per cent, and the enthusiasm ran high. Special tags were

distributed to accompany the automobile license plates, and this was supposed to mark the beginning of a great expansion of the city - a metropolitan Knoxville. If, however, one looks at the percentage the city made up of the total county population in 1910 and then in 1920 the falsity of the reported increase can readily be seen. During this period the percentage of the whites in both the city and the county population was the greatest to date, excepting the county population which was given only in the census of 1800.

During the period from 1920 to 1930 the city population continued to increase as did the population in the county. The city had an increase of 35.9 per cent, while the county population expanded by 38.06 per cent. The rate of increase in this decade was more normal with resulting affects shown in an increased county population.

Since no statistics by the government are available, a definite figure on the present population cannot be given. However, by comparison of growth based on figures since 1900, it is quite safe to say that the city population is somewhere in the neighborhood of 122,000 persons by a projection of the curve on the Population Growth Chart at the same rate of growth as in the preceding decade.

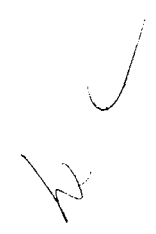


Table I

II A

Population Statistics - Knoxville, Tennessee

1850 - 1930

Year	Total	Population			% Total Population		Actual Numerical Increase from Previous Census				% Increase Based on Total Population		
		White	Negro	Others	White	Negro	Total	White	Negro	Others	Total	White	Negro
1930	105,802	88,705	17,093	4	84.0	16.0	27,984	22,194	5,791	-1	35.9	28.5	7.4
1920	77,818	66,511	11,302	5	85.5	14.5	41,472	37,805	3,664	3	114.1	104.0	10.1
1910	36,346	28,706	7,638	2	79.0	21.0	3,709	3,428	279	2	11.35	10.5	0.85
1900	32,637	25,278	7,359	-	77.5	22.5	10,102	9,172	936	-6	45.0	40.8	4.2
1890	22,535	16,106	6,423	6	71.5	28.5	12,842	9,562	3,274	6	132.9	98.9	34.0
1880	9,693	6,544	3,149	-	67.5	32.5	1,011	471	540	-	11.7	5.44	6.26
1870*	8,682	6,073	2,609	-	70.0	30.0	6,606	4,595	2,011	-	318.5	221.5	97.0
1860													
1850	2,076	1,478	598	-	71.2	28.8							

* Population statistics prior to 1850 and in 1860 not returned separately

Table II

11 B

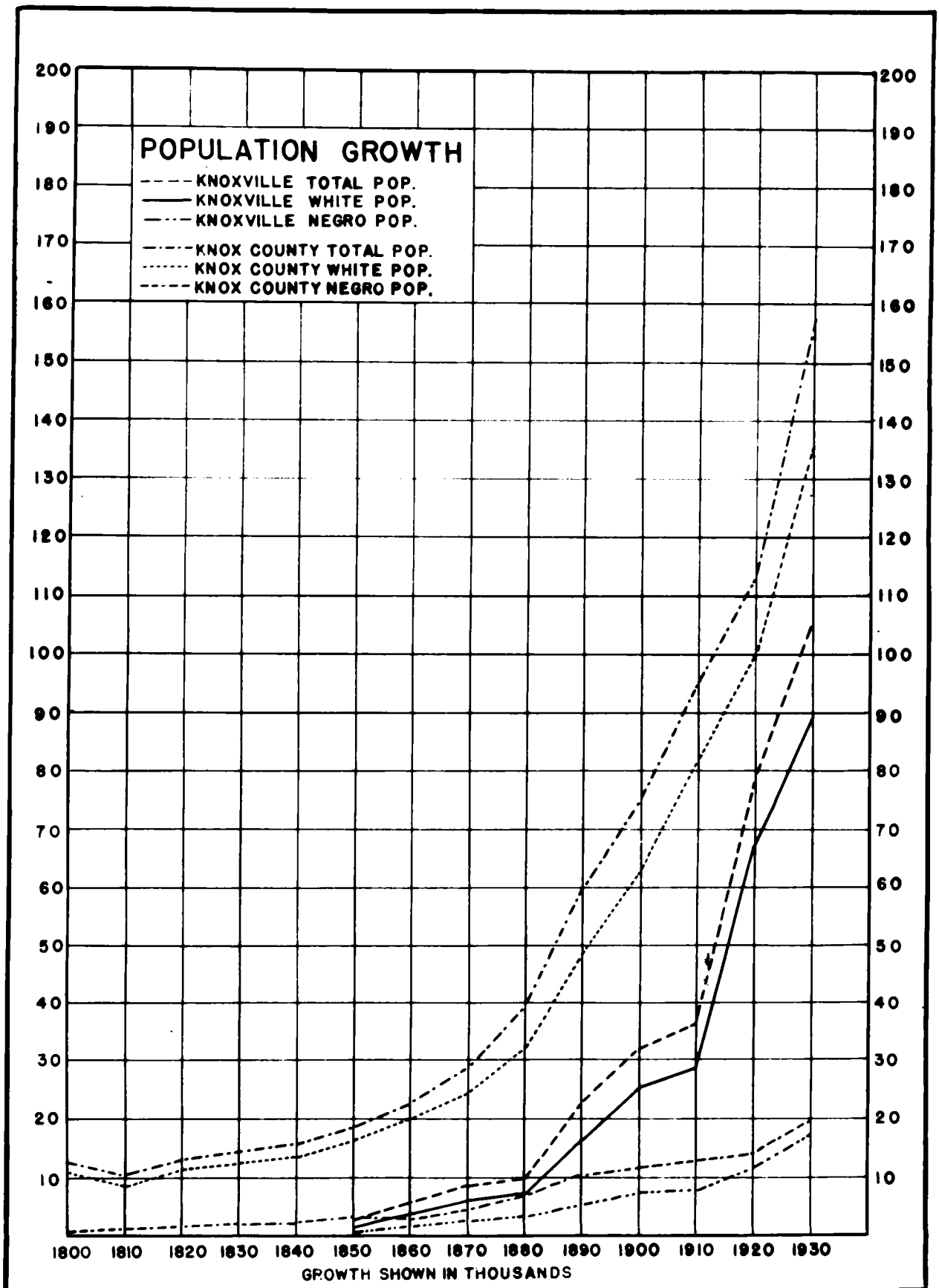
Population Statistics - Knox County, Tennessee

1800 - 1930

Year	Population				% Total Population		Actual Numerical Increase from Previous Census			% Increase based on Total Population		
	Total	White	Free Negroes	Slaves	White	Negro +	Total	White	Negro +	Total	White	Negro +
1930	155,902	136,698	19,198	-	87.7	12.3	42,975	37,091	5,888	38.06	32.85	5.21
1920*	112,926	99,607	13,310	-	88.3	11.7	18,730	18,131	601	19.9	19.25	0.64
1910*	94,187	81,476	12,709	-	86.5	13.5	19,988	18,951	932	26.76	25.51	1.25
1900	74,302	62,525	11,777	-	84.2	15.8	14,745	13,916	829	24.76	23.37	1.39
1890	59,557	48,609	10,948	-	81.5	18.5	20,433	16,729	3,704	52.3	42.76	9.47
1880	39,124	31,880	7,244	-	81.5	18.5	10,134	7,730	2,404	34.96	26.66	8.30
1870	28,990	24,150	4,840	-	83.3	16.7	6,177	4,130	2,047	27.08	18.11	8.97
1860	22,813	20,020	423	2370	87.5	12.5	4,000	3,635	371	21.3	19.33	1.97
1850	18,807	16,385	229	2193	87.0	13.0	3,322	3,007	259	21.52	19.42	2.10
1840	15,485	13,378	173	1934	86.4	13.6	987	1,021	-34	6.8	7.04	-0.24
1830	14,498	12,357	108	2033	85.3	14.7	1,464	1,231	208	11.23	9.63	1.6
1820	13,034	11,126	83	1825	85.4	14.6	2,863	2,250	613	27.18	-21.13	6.05
1810	10,171	8,876	24	1271	87.3	12.7	-2,275	-2,253	-22	-18.28	-18.10	-.08
1800	12,446	11,129	19	1298	89.4	10.6						

* Where number of whites and negroes is less than total population, difference is due to inclusion of other "non-whites".

+ Free negroes and slaves considered collectively.

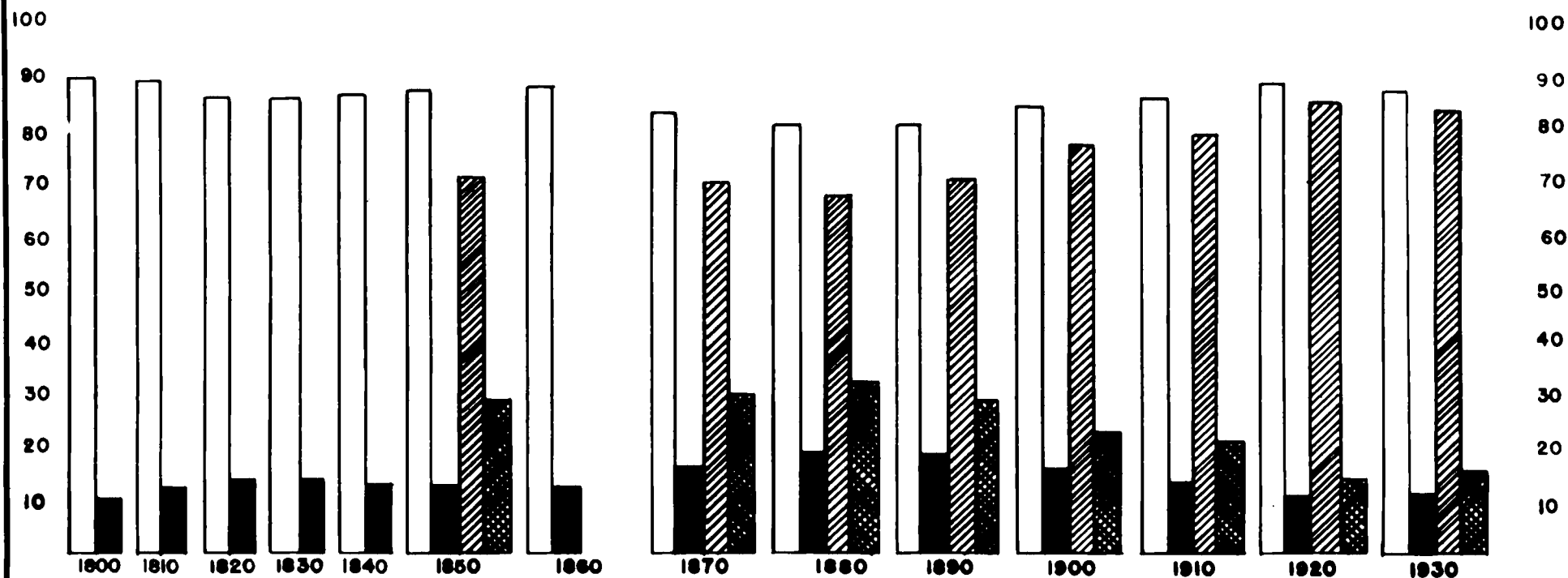


PERCENTAGE OF TOTAL POPULATION

WHITE AND NEGRO

□ KNOX COUNTY - WHITE
 ■ KNOX COUNTY - NEGRO

▨ KNOXVILLE - WHITE
 ▩ KNOXVILLE - NEGRO



CHAPTER III
GEOGRAPHIC FACTORS AFFECTING GROWTH
AND DEVELOPMENT OF CITY

I. Tennessee River

The dominant influence in the location of Knoxville was the presence of the Tennessee River which provided a means of transportation. In the early days rivers were the important highways, especially so in areas of rugged relief as in East Tennessee. The settlers from the north-east came into the region by routes along the Holston River Valley, and some of them floated down the river on rafts.

The strategic importance of this river may be better understood when it is borne in mind that the Great Valley of East Tennessee is drained entirely by the Tennessee River and its major tributaries, namely: the Holston, Watauga, Nolichucky, French Broad, Little, Little Tennessee, Hiwassee, Clinch, and the Powell.

Tennessee River and its tributaries meander irregularly through much of the Valley. The convex sides are usually lined by bluffs, while fertile flood plains border the concave side. The master stream maintains a general southwest direction from Knoxville to Chattanooga, where it leaves the Great Valley of East Tennessee, and sweeping past the foot of Lookout Mountain in picturesque Moccasin Bend, turns

abruptly west to enter the winding gorge carved across Walden Ridge. Emerging in Sequatchie Valley, it turns south into Alabama.¹

The city of Knoxville, situated four and one-half miles below the junction of the Holston and the French Broad Rivers, was a natural focal point for commerce from the tributary regions of the Tennessee. Although the River was always hard to navigate, in the early days it was the only means for the transfer of heavy and bulky goods. The region surrounding the Tennessee drainage system has been subjected to a ruthless cutting of timber, followed by extremely poor farming. As a result, it is a muddy stream having an irregular flow, and its channel is filling with sand bars. Today, the Tennessee River plays a much less important part in transportation as the river boats cannot compete successfully with the more rapid and dependable railway and highway carriers.

II. Location in Great Valley

The Great Valley of East Tennessee is a segment of the Great Appalachian Valley, which extends from southeastern New York to central Alabama. The location of Knoxville in this Valley is of great importance since here is a center of trade in an area of remarkable

1. Amick, H. C., "The Great Valley of East Tennessee," Economic Geography, Vol. 10, No. 1, p. 38.

continuity that not only provides a route of communication, but also supplies an area suitable for the production of foodstuffs, a region wealthy in minerals and forests, and with the close proximity to the coal of the Cumberland Plateau and the many swift flowing mountain streams - a wealth of potential steam and hydro-electric power.

The topography of the Valley readily lends itself to travel in a northeast-southwest direction, as it is characterized by closely furrowed valleys between parallel ridges. The effect of this type of topography on transportation lines is noted by the highways, railways, and airlines tending to parallel the Valley.

The Great Valley is primarily an agricultural district, and with such a hinterland the stability in the steady growth of Knoxville may be partially accounted for. The Valley presents a variety of conditions largely the result of soil, topography, and drainage, which depends to a great extent on the character of the underlying rock formations. The flood plain areas are the regions of the most productive soils. These soils are not residual, but fluvial or transported, being derived from the rocks farther upstream. These areas are especially suitable for the production of grains, but frequent inundations

make the importation of such products necessary.

About one-third of the Valley is underlain by the Knox dolomite formation, which upon weathering develops into rich, deep, fertile, red soils, of a loamy nature containing more or less chert. The Chicasauga limestone formation in the Valley is of much less importance, as the area concerned is relatively small, and the resultant soils, although high in silt and clay, have a tendency to form clods. Other limestone soils are found within the Valley being derived from the marbles and miscellaneous limestones. Such soils lend themselves to the production of a diversity of products, corn, hay, wheat, alfalfa, clover, tobacco, cotton, and truck products where climatic factors are favorable.

A similar variety of crops are produced on the soils of the Valley derived from the underlying shales. The soils in themselves are much less fertile, and the maintenance of the fertility is a greater problem than in the limestone regions. "They are compact, shallow, and wash away easily, thereby increasing the amount of waste land."²

2. Amick, H. C., "The Great Valley of East Tennessee," Economic Geography, Vol. 10, No. 1, Jan. 1934, p. 38.

The least productive soils of the Valley are those found on the mountains and the rugged ridges, and in only a few isolated places are they being utilized for agricultural purposes. The majority of this land is being left to timber and waste, and it supports only a backward population.

The economic significance of this varied agricultural economy on Knoxville is shown by the fact that this city has become the largest hatchery center in the South. Creameries are much in evidence, and with the waste products of this industry the production of poultry and swine has taken place. Waste products alone do not account for the large production of hogs, as a large corn crop plus a mild climate provide favorable conditions for their growth. The poultry industry is of utmost importance, although the immediate area surrounding Knoxville is secondary to that of Morristown and Greenville. This area is the greatest poultry-producing district in the South, and its importance is readily felt by fluctuations in the market prices as far north as New York.

Supplementing the agriculture of the Valley, and although surpassed in value by the products of both the farm and the factories, the products of the mines and the quarries have been and are still of great importance.

The mineral deposits are widespread and varied, and include such minerals or mineral products as: iron, zinc, barite, manganese, bauxite, lead, marble, cement, and clay products. This great diversification lends itself to a stability that is not found in an area upon which the whole economic structure is based on one industry.

The iron minerals are very common, and in the early days were of much greater importance than at present. The ores in the Valley that have been considered of economic importance are found in the Rockwood formation of Silurian age that outcrop near the foot of the Cumberland Escarpment.³ The ores have made possible the location of numerous furnaces in the vicinity of Cumberland Gap, LaFollette, Rockwood, Dayton, Seddy, and Chattanooga. However, due to the extremely high cost of extraction the furnaces have gone out of operation being unable to compete with production from the Birmingham and the Great Lakes area. Although not directly connected with the economic structure of Knoxville their influence has been felt by the location of processing mills in Knoxville itself.

3. Born, Kendall, Summary of the Mineral Resources of Tennessee, State of Tennessee, Department of Education, Division of Geology, Nashville, 1938, p. 65.

The zinc deposits of the region are in close proximity to the city, with mines in operation at Mascot, New Market, and Jefferson City. The zinc obtained is mainly from the mineral sphalerite, a zinc sulphide. The mines at Mascot have been worked over a long period, as evidenced by the large excavations in the mines. The ores are found in a brecciated zone in the Knox dolomite formation of Cambro-Ordovician age.⁴ The mineralized zones are found at various horizons, and apparently conform to the dip and strike of the formation.

Barite deposits, the sulphate of barium, have been of importance in the Sweetwater section of the Great Valley,⁵ although at the present time the deposits are being worked only to a very small extent. In this region barite occurs in the form of residuals in clay and considerable quantities of quartz, calcite, and fluorite are encountered as associated minerals.

4. Ries, H., Economic Geology (Seventh Edition). (New York: John Wiley and Sons, Inc., 1937), p. 554.

5. Born, Kendall, Summary of the Mineral Resources of Tennessee, (Nashville: State of Tennessee, Department of Education, Division of Geology, 1936), p. 42.

ZINC



ELECTRIC HAULAGE NO. 2 MINE-
AMERICAN ZINC CO. MASCOT, TENN.



CONCENTRATING PLANT NO. 1 MINE, AM. ZINC CO. MASCOT, TENN.
ON TENNESSEE RIVER.



LOADING ZINC ORE
EAST TENNESSEE MINE.



DRILLING & LOADING ZINC ORE
EAST TENNESSEE MINE



EMPLOYEES VILLAGE AM. ZINC COMPANY MASCOT, TENN.



ZINC TAILINGS CALLED 'CHATS' AMERICAN LIMESTONE CO. MASCOT, TENN.
ON TENNESSEE RIVER.



ELECTRIC CAR DUMP & CONVEYOR
EAST TENNESSEE ZINC MINE



GENERAL VIEW OF AMERICAN ZINC CO. CONCENTRATING PLANTS AND MINE HOUSES, MASCOT, TENN. (ON TENNESSEE RIVER.)

MADE IN U.S.A.

Manganese ores have been worked near Johnson City in the northeast,⁶ and in the southern portion of the Valley in Ordovician limestones, although from an economic point of view they have never been highly important. Bauxite deposits have also been reported in eastern Tennessee,⁷ and although the satellite town of Alcoa is a great producer of metallic aluminum the ore is brought in from other localities. Lead was located and worked in several places, and during the pioneer period was of importance. The necessity of lead for bullets opened these mediocre deposits, which have not been operated for a number of years.

The greatest mineral resource in the vicinity of Knoxville, and the one playing a great part in its development is marble. This section of the country ranks as one of the leading marble-producing areas along with Vermont and Georgia. The Chickamauga limestone formation, locally known as the "Holston" beds, supplies marble of gray, pink, deeper shades of red, and chocolate color, with white variegation.

6. Minerals Yearbook 1938. United States Department of the Interior, Bureau of Mines, 1938, p. 530.

7. Parkins, A. E., The South Its Economic-Geographic Development (New York: John Wiley and Sons, Inc., 1938). p. 40.

The first quarries were opened about 1847 in the vicinity of Rogersville, and large quantities were shipped to Washington for interior use in the construction of the United States Capitol. With the decline in demand for the darker shades the area of production shifted to the vicinity of Knoxville.

A cement plant has been opened near Knoxville as the result of outcrops of suitable limestone and shale. There are numerous other areas suitable for the establishment of plants, but the limited market does not justify their construction. Like the cement industry, clays suitable for the manufacture of tile and brick are common throughout the Valley, and as a result plants are established mainly to supply local demands. Knoxville has become a center for tile and brick production in the Valley, and there is great room for expansion as innumerable reserves of untouched deposits are near-by.

The consideration of the forest resources of the Great Valley and its influence on the development of Knoxville cannot be overlooked, as today lumber milling and wood-working constitutes one of the most important manufacturing enterprises. From the earliest times the forests have influenced the lives of the people within the region. In the earlier days the forests presented a problem, and many

20A



VOLUNTEER PORTLAND CEMENT COMPANY

MADE IN U.S.A.

trees were piled into huge heaps and burned, others were girdled and allowed to rot on the stump.

The whole valley was originally covered with an excellent growth of hardwoods, and it is of interest to note that certain trees were associated with individual soil formations. Heavy stands of oak, hickory, and chestnut were characteristic of the Knox dolomite soils on the cherty ridges; the maddy Lenoir limestone supported cedar glades; the shale belts were marked by a variety of large trees, including the giant poplars; and, the acid soils of the glades high on the sandy ridges produced growth of the chestnut.

Today the major portion of this forest that covered the Great Valley has been destroyed. In the early establishment of an agrarian system the cutting could be justified, but even today slopes are being cleared which can only lead to a further wasting of the land. Roderick Peattie⁸ reports that the top soil of a 20° slope is destroyed after one hundred plowings. Due to the fact that the timber can be easily moved down grade by streams, railways, and highways, Knoxville as well as a few other cities in the Valley has had an exceptional advantage for woodworking establishments.

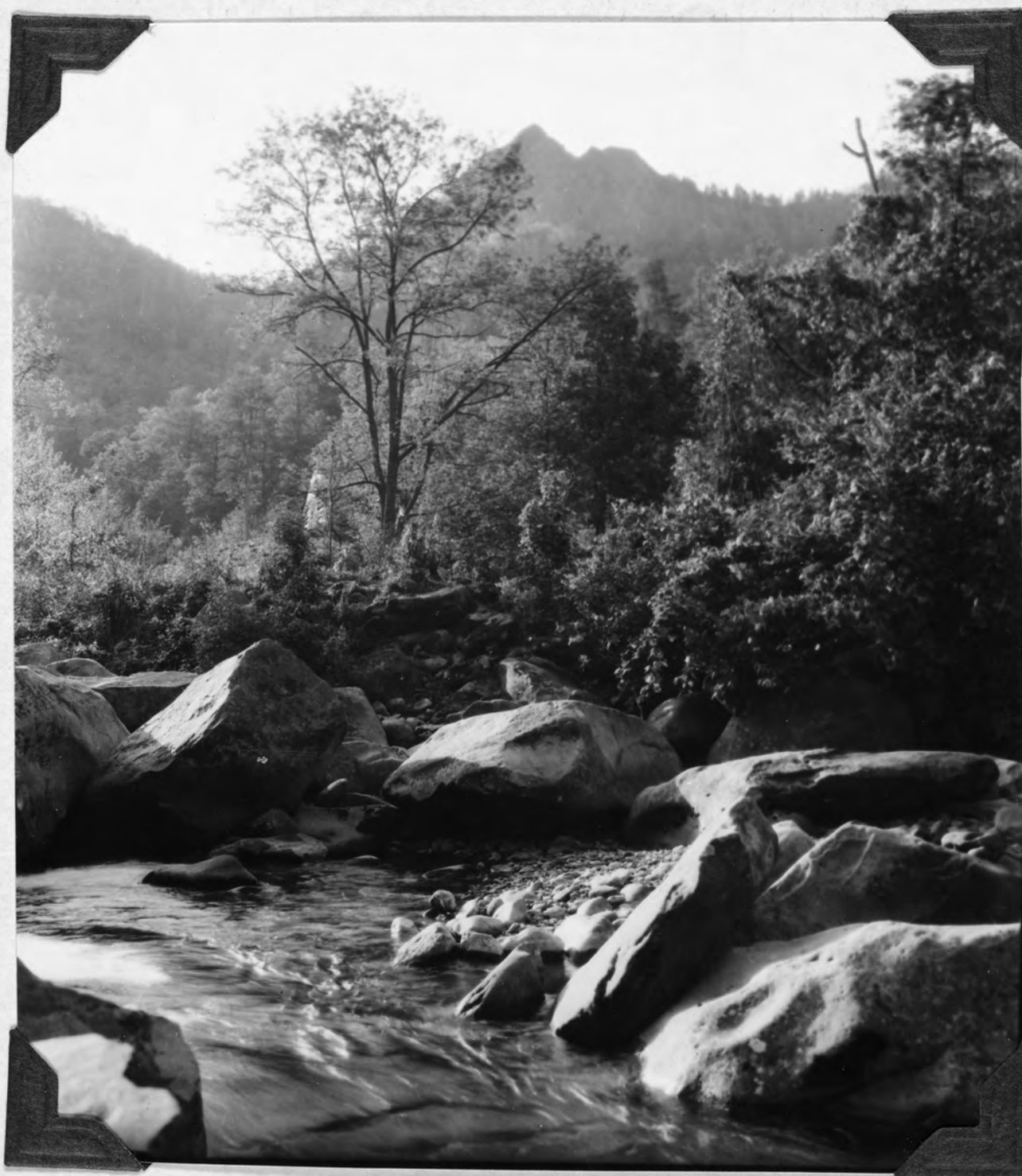
8. Peattie, Roderick, New College Geography (Boston: Ginn and Co., 1932), p. 232.

SCENIC VIEWS OF THE GREAT SMOKY MOUNTAINS

21A



THE SMOKIES



CHIMNEY TOP

21B



DOME CASCADES



MT. LE CONTE

III. Influence of the Unakas

The Unaka Chain of Mountains of the Blue Ridge Province, which forms the southeastern boundary of the Great Valley was a definite geographical factor in the development of Knoxville. The Unaka Chain makes up the most massive part of the Appalachian Mountain System, and so effectively proved to be a barrier dividing the original North Carolina territory that the region comprising the Tennessee country was commonly referred to as the "lost colony". This barrier not only proved to be one of a cultural and political nature, but an economic barrier as well diverting the trade west of the mountains towards Knoxville, and prohibiting trade east of the Mountains from entering into the commercial life of the city. The Unaka mountains have been intersected by the tributaries of the Holston, the French Broad, and Tennessee rivers in deep and narrow gorges. The economic influence of the barrier presented by the Unakas and the gaps are still in evidence by the presence of western North Carolina tobacco being "sold off the floor" of the Knoxville tobacco auction warehouses. Even with the improvement of transportation facilities, the majority of the commercial products are shipped via the Great Valley to the vicinity of Chattanooga and thence eastward to Charleston, South Carolina. Railroads



TOBACCO AUCTION IN A KNOXVILLE WAREHOUSE

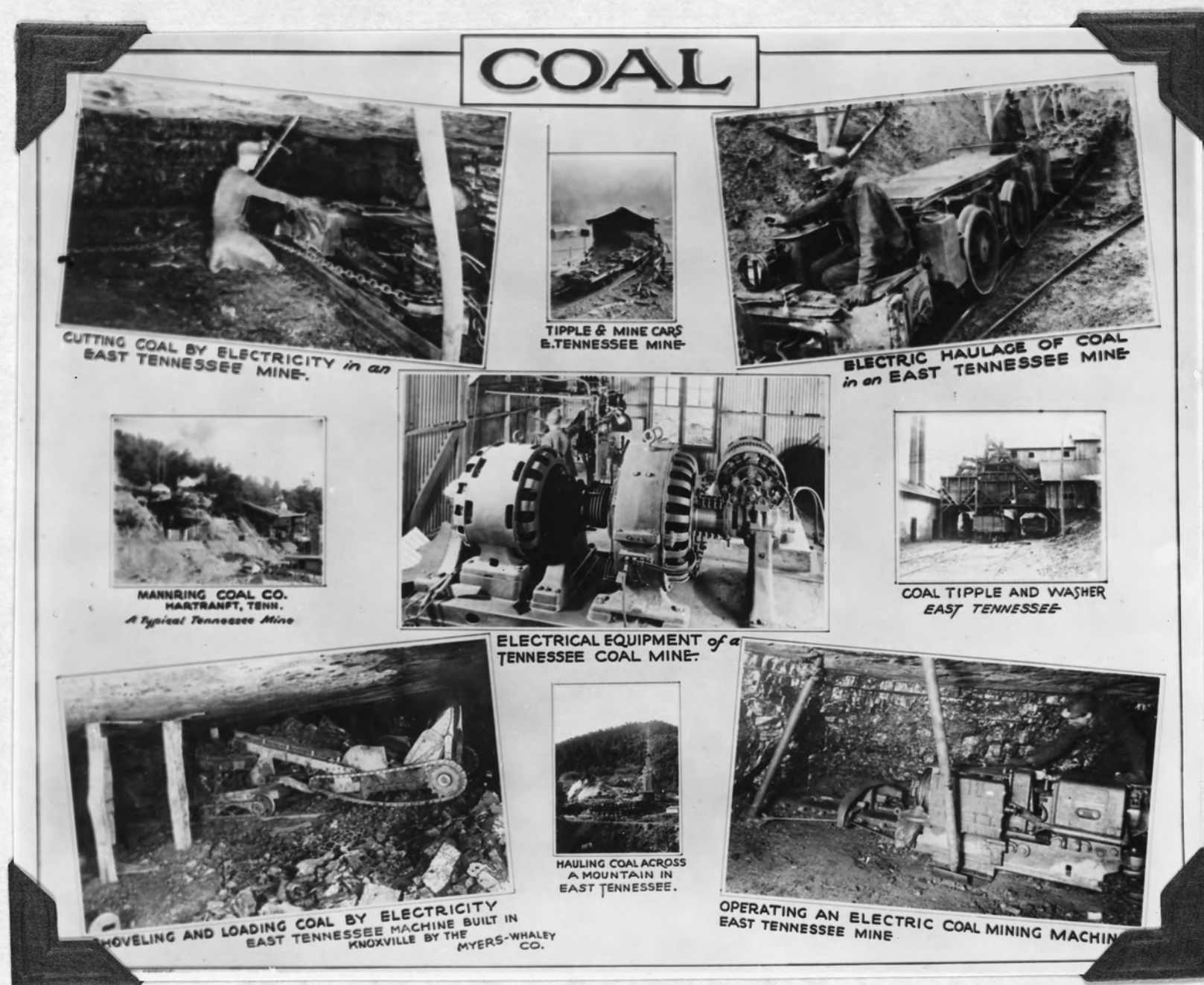
and airlines definitely recognize the importance of this range of mountains, and in so far as possible, attempt to avoid it.

The presence of this barrier is a definite handicap to Knoxville, as the diversion of trade from the side east of the mountain to other sections is detrimental to Knoxville's development. With wise supervision and public support, the scenic resources of the area may be profitably marketed and tend to off-set the barrier handicaps. The setting aside of a portion of the Smoky Mountains into a National Park will tend to bring results not only accruing from the tourist trade, but will bring about a nation-wide consciousness of the scenery as well as the resources of this locality.

IV. Cumberland Plateau and the Cumberland Gap

The Cumberland Plateau, which makes up a part of the Appalachian Plateau, and which bounds the Great Valley of East Tennessee on the northwest proved to be another barrier that has tended to divert movement in the Valley in a general northeast-southwest direction. The east side of the Plateau is sharply outlined by an escarpment. The immediate effect of such a line of demarcation is that the hinterland, or trading area, of Knoxville tends to terminate with this obstruction or topographic break.

The natural resources of this region, from an economic point of view, consist mainly of coal, building stone, clay, oil, gas, and timber. The only ones of any considerable importance are coal and timber. The coal in this vicinity was discovered at an early date in the history of Tennessee, and lead to the development or establishment of many pioneer industries. The presence of coal was a big factor in the development of the railways, not only as a source of fuel for the then existing lines, but it necessitated the building of other lines to take advantage of the deposits. The importance of this resource on the development of Knoxville was extremely important as here was a source of power for industries in the city, which could not have existed if it were necessary to bring in the fuel from other areas. The coal of this area is of the bituminous type of Pottsville age, and although the coals and associated rocks were deposited in a broad trough, due to subsequent folding, faulting and erosion, the basins are now separated by intervening anticlinal crests. Another type of coal within the area is cannel coal. Although cannel coal has been of great importance in some sections of the United States, that found in the Tennessee fields is not particularly desirable due to the great amount of ash.



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MADE IN U.S.A.

The timber of this section cannot be overlooked as today it is even of greater importance than formerly. Due to the enormous cutting that took place in the Unaka region, timber has become scarce, but this area today is supplying many of the Knoxville industries. Lumber milling and woodworking has always been of great importance in this city, as the first industry established was a tub mill. A casual survey of the existing manufacturing establishments presents the picture much more clearly. Within the city are thirty-four businesses directly connected with the lumber industry, and numerous others that are dependent upon it indirectly. The products from such industries consist of rough lumber, finished lumber, veneer, cabinets, furniture, boats, boxes, crates, window casings, sash, refrigerators, store fixtures, caskets, barrel heads, cross ties, screens, truck bodies, and barrel staves. Certainly a great deal of the present importance of these industries depend upon the continued supply of timber from the Cumberland Plateau region, as well as that from the Unakas.

The building stones within the Plateau are not of much economic importance, except the Crab Orchard Sandstone. Some of the limestone within the region was unsuccessfully placed on the market several years ago, but due to a small demand for the stone plus extremely high extractive and

transportation costs production was curtailed. However, in recent years some of the material has found its way into the channels of trade as burned or slacked lime. The clay found within the Plateau also met with the same fate, as bulky goods with a low unit value cannot stand transportation costs. As a result, tile production and associated clay products are limited to local production in the vicinity of Daisy and Robbinsville. The presence of oil and gas in this section although of importance locally has not been of great economic importance due to the fact that the oil is in less demand than that found in Pennsylvania, and that the amount of gas is not in quantities sufficient to justify the expenditure for gas lines to cities that could utilize it.⁹ Also within this Plateau are found nodules and concretions of iron carbonate interstratified with shales of Pennsylvanian age. "Little work has been done in this general region and the ore of this type has not proved to be important in Tennessee." ¹⁰

As a result of the handicaps placed upon the Plateau section by topographic barriers, the purchasing power of the inhabitants is limited. Self-sufficient

9. Born, Kendall E., Summary of the Mineral Resources of Tennessee (Nashville; State of Tennessee Department of Education, Division of Geology, 1936), pp. 74-75.

10. Ibid., p. 63.

agricultural pursuits are the general rule, as the only markets within a reasonable distance are those mining centers located within the Plateau which are relatively few, and small in size.

The importance of the Cumberland Gap on the development of Knoxville cannot be overestimated. This pass presents the most feasible one across the Cumberland and Allegheny fronts from Maryland to northern Alabama. The early trails into the regions farther west took advantage of this break in the mountains which occurred due to a gap being cut by a stream, and then being beheaded, as a result of stream piracy. This gap has played a dominant role in westward migration, and during the period from 1775 to 1800 it is estimated that more than 300,000 persons passed through the Great Valley and this break in the Cumberland Front.¹¹

Even with the remarkable advances in transportation, advantage is taken of this pass as evidenced by the presence of one of the lines of the Southern Railway which connects Knoxville with Pineville, Kentucky. The unfavorable topographic factors of the Cumberland Plateau are further noticeable by the fact that the railway lines branch from

11. Smith, J. Russell, North America (New York: Harcourt, Brace and Company, 1928), p. 197.

the Gap, eastward following the great Valley, thus leaving the northeastern part of Kentucky without a railway that crosses that part of the state in a north-south direction. The automobile roads also show a parallelism similar to that of the railways, with a smooth-surfaced highway traversing the Plateau region by means of this gap.

V. Climate

The effect of climate on the growth of Knoxville can best be understood by a consideration of the conditions that prevail in this vicinity. In general, an analysis of the climate of this city shows: (1) a comparatively mild climate, having relatively warm summers and cool winters; (2) a more or less even distribution of rainfall; and, (3) a variable distribution of winds.¹²

The mildness of the climate is due to the city's latitudinal location and position on the continent. This type of climate lies within the humid mesothermal realm, and is characterized by high relative humidity, which in summer causes the sensible temperature to be much above that of actual temperature. Normally, the winters are relatively mild, as over a period from 1875 to 1910,

12. Hudson, G. Donald, Atlas of Tennessee Valley Region, Part I, The Natural Series, Section II, Climatic Elements, Land Planning and Housing Bulletin, No. 9A-Division File No. A 15. Tennessee Valley Authority, Knoxville, June 1936. p. 8.

there were only twenty-two days when the temperature reached zero or below. As to real winter days, days on which the temperature was at no time above freezing, over the same period of time, there was not a year in which there were more than sixteen such days, nor less than one.

The annual rainfall for the city is 48.31 inches, quite evenly distributed throughout the year with the heaviest rainfall coming in March with slightly over five inches. During the summer months there is over four inches of rain each month, which is largely the result of thunderstorms brought about by the region being situated in a valley between the Cumberland Plateau and the Unaka Mountains, "There are two so-called wet seasons - winter and summer, and two drier seasons - late spring and early autumn." 13

The temperature curve for the year shows a more marked variation, ranging from a low mean monthly temperature of 39.1 degrees in January to 77.3 degrees in July. The annual mean temperature for the city is 58.6 degrees. The United States Weather Bureau, in compiling the reports

13. Widmeyer, J. I., Annual Meteorological Summary, Knoxville, Tennessee, 1927 (Atlanta: U. S. Department of Agriculture, Weather Bureau, 1928), p. 2.

for Knoxville over a period of sixty-six years in the Annual Meteorological Summary for Knoxville, Tennessee,¹⁴ has arrived at the following conclusions in regard to mean temperature and precipitation by months:

<u>Month</u>	<u>Mean Temperature (Degrees Fahrenheit)</u>	<u>Mean Precipitation (Inches)</u>
January	39.1	4.55
February	41.6	4.62
March	49.1	5.26
April	58.3	4.39
May	67.0	3.76
June	74.4	4.25
July	77.3	4.34
August	76.1	4.02
September	71.1	2.84
October	59.2	2.61
November	47.9	3.26
December	40.4	4.41
Year	58.5 (Average)	43.31 (Total)

The length of the growing season in the vicinity of Knoxville is approximately seven months, thus permitting the production of winter grains and leguminous crops which hold feeding costs of cattle at a minimum. The growing season refers to the number of days between the last killing frost in the spring and the first killing frost in the fall. On the average there are 208 days between these two frosts in the Knoxville area, during

14. Sanders, J. E., Annual Meteorological Summary, Knoxville, Tennessee, 1936 (Nashville: U. S. Department of Agriculture, Weather Bureau, 1937), p. 3.

which time the more tender vegetation may grow uninjured. However, the hardier plants grow long before that period begins, and after it ends, and there is more or less growing weather in every month of the year. The presence of the Cumberland Mountains causes the growing season at Knoxville to be considerably longer than at the same elevation on the western slope or beyond.¹⁵

The seasons are well marked, and the seasonal change is much more rapid between summer and autumn, than spring and summer. The effect of topography upon the climate of Knoxville is shown by the direction of the winds which blow principally from the southwest and northeast, or up and down the valley.¹⁶ During the greater part of the year the southwesterly winds predominate, although during August, September, and October the northeasterly winds exert considerable influence. High wind velocities in Knoxville are a rarity, and those that do occur are associated with summer thunderstorms, or else take place

15. Voorhees, John F., Climatology of Knoxville, Tennessee (Rochester: U. S. Department of Agriculture, Weather Bureau Office, Jan. 1, 1913), p. 9.

16. Ibid., p. 4.

at night due to convection currents set up by the presence of near-by highland areas. Due to these conditions, "smog" (smoke and fog) often envelopes the city, a condition that could not possibly take place with definite and strong wind movements.

The effects of such climatic conditions on the development of Knoxville are varied and numerous: (1) the climate is a stimulating one; (2) heating costs, both for industrial plants and homes, are low compared to regions farther north; (3) transportation is not hampered by winter conditions; and (4) late spring and early autumn frosts are not so frequent, thus eliminating abnormally high costs for feedstuffs.

VI. People

Certainly no factor could be more important to the development of Knoxville than the people who first inhabited it. Unlike the settlement of the Piedmont, Knoxville and the Great Valley was inhabited by a heterogeneous group not only on a basis of birth but religion as well. Colonists came from Virginia, Maryland, Pennsylvania, the Carolinas and other regions of the northeast.¹⁷ Due to the necessity of warding off the dangers of native and

17. Parkins, A. E., The South Its Economic-Geographic Development (New York: John Wiley and Sons, Inc., 1938), p. 96.

nature in the new region, the English, Scotch-Irish, Germans, and French mingled together and forgot differences based on racial grievances and religious beliefs.

These immigrants, many of whom had become dissatisfied with increased population in the East, moved into the Great Valley. Some stopped only for a little while, while others lingered to develop the section. Such a pioneer spirit was bound to develop a hardy group. The definite influence of the English and the Scotch-Irish is still in evidence. The names of the English, Scotch-Irish, Germans, and French are the common rule rather than the exception. The effects of religion are still evidenced by the numerous churches within the community, and the carry-over of the belief that the Sabbath should be rigidly observed. As a result, Knoxville is one of the few cities in the United States that does not tolerate Sunday movies.

Such an influx of people into the Great Valley and Knoxville led to a resourceful type of colonist. The land was soon placed under cultivation, the natural resources were made the basis of infant industries, the near-by streams were harnessed for power, the development of roads took place, and above all education was not neglected. On September 10, 1794, Blount College was chartered by the

Legislature of the "Territory South of the River Ohio," and in 1807, the name was changed to "East Tennessee College." In 1879, the school became the University of Tennessee. In addition, numerous denominational schools were established throughout the region.

With the resourcefulness of the people and their foresight it is no wonder that Knoxville has developed into an important city despite its several handicaps. The settlers were descendants of that great group of pioneers that settled the eastern part of the United States, and Knoxville stands today as a tribute to their unyielding spirit, integrity, and resourcefulness.

CHAPTER IV

MAJOR FUNCTIONS OF CITY AND GENERAL PLAN OF OCCUPANCY

I. Major Functions of City.

The major functions of the city of Knoxville are very similar to those functions that have aided greatly in the development of Birmingham, Chattanooga, and Bristol. These four cities are fairly evenly spaced throughout the southern part of the Valley, and are served by major railway lines, with spur lines radiating in east-west directions. This feature gives these cities a distinct advantage over other towns as the Valley offers a transportation route not presenting great topographic barriers with the industrial northeast and Gulf ports of the United States. Although Knoxville is not the largest of the cities mentioned, it has played a dominant role in the development of East Tennessee. It is the largest city within a radius of 100 miles, and this will have a definite effect on the further utilization of the land. Knoxville is served by two major railway lines, the Louisville and Nashville, and the Southern, and spur lines make it a focal point for trade in this area. Although this may not compare favorably with other large cities in the North or East, two such major lines are bound to add greatly to the growth and development of the region in which many detrimental topographic features are in evidence.

II. On Tennessee River.

The presence of the Tennessee River has always influenced the development of Knoxville although at the present time there are no public carriers operating out of the city on the river. In the past, steamers operated regularly to Knoxville from points on the Holston and French Broad Rivers as well as the Tennessee, but today only sand and gravel companies maintain boats with the exception of United States government boats which make occasional trips between Knoxville and Chattanooga. The contemplated construction of a nine-foot channel on the Tennessee River, from Knoxville to Paducah, Kentucky, by the Tennessee Valley Authority is being given serious consideration, and according to present plans will be completed in 1943. Even with such improvements there is room for speculation as to whether boats over such a route can meet the competition of the more rapid carriers.

Consideration is also being given to the construction of a canal to connect the Tennessee River through Alabama with the Warrior River transportation system which operates from Birmingham to the Gulf of Mexico. Construction of another canal to connect the Tennessee and Tombigbee Rivers is being advocated.¹

1. Knoxville Chamber of Commerce, Industrial and Commercial Survey, Section XVI, (b) Water Transportation, (Knoxville; Knoxville Chamber of Commerce, 1939), p. 1.

III. As a Distributing Center.

As a distributing center Knoxville ranks foremost among the cities of East Tennessee, with a total of 191 wholesale distributing agencies. The dominance of this city as a trading center can well be understood when geographic factors are considered. From the earliest times, the city has been a trading center, and in 1935 the estimated net sales totaled nearly \$52,000,000. The types of products emanating from this city consist of automobiles, beverages, clothing, coal, coke, a full line of drugs and drug specialties, dry goods, electrical goods, farm products, groceries, lumber, building materials, machinery, paper and paper products, plumbing supplies, and shoes.

As a retail distributing center, Knoxville has a total of 1,518 stores, serving about twenty counties of Tennessee, three of Kentucky, and two of Virginia. The number of chain grocery stores within the city has declined in number, although the total business has not materially decreased due to the innovation of "Super Markets." The number of wholesale distributing houses has also decreased in number, by the voluntary liquidation of several of the firms of long establishment.

IV. As a Manufacturing Center.

The part that manufacturing has played in the growth of the city cannot be overlooked, as Knoxville is one of the leading manufacturing cities in the South. The industrial development of Knoxville is well diversified, with no one industry accounting for as much as one-sixth of the total value of manufactured products. The value of manufactured products produced in this area (Knox County) ranks fourth in the state as a whole, following Hamilton County (Chattanooga), Davidson County (Nashville), and Shelby County (Memphis).

Marble is of great importance, and this section of the country vies with Vermont and Georgia for supremacy as the leading marble-producing area. The greater part of the marble produced in Tennessee comes from the vicinity of Knoxville, and its value as a building stone has been proven beyond a doubt. The demand is no longer local, and a great deal of it finds its way into the channels of world-wide trade. In addition to this, great quantities of foreign marble are brought into the city for processing and is distributed to the building trade throughout this country.

Textiles make up a great portion of the products going out from this city, and one particular specialty is

the manufacture of Palm Beach cloth by the Goodall Company. Knoxville is the center for the production of heavy-knit underwear. The total value of textile products in this city, which include knit goods, men's clothing, and processed goods, approximated a value of \$25,000,000 in 1938.

The Fulton Sylphon Company is one industry that has played a great part in the later development of the city. This company has enjoyed great prosperity due to patent rights on low-pressure regulating devices which are used throughout the country. This is one specific industry that requires the employment of highly skilled men, and which has greatly aided in the raising of wages in this section.

Within the city are numerous other outstanding industries that should not be overlooked. The city has the only iron rolling mill in the state, and a plant that leads the world in the manufacture of automatic drop-bottom mine cars. The Southern Railway System maintains the second largest railway shops in the state in Knoxville, and the city boasts the largest veneer plant in Tennessee. Sand and gravel production within the vicinity of Knoxville is of local importance, and in the output of mucking machines for drilling tunnels up to eighteen feet in diameter, the city leads the world.

Within the area which might well be included with the city (true hinterland) are plants that have contributed greatly to the continued advancement of Knoxville. In Blount County, at the town of Alcoa, the Aluminum Company of America has a plant for the reduction of aluminum by hydro-electric power. This plant has expanded in the past few years, and now employs approximately 4,000 persons.

In Knox County and also parts of Jefferson County, three concerns have opened mines for the production of zinc ore, and it is from these two counties that practically all the zinc ore produced in Tennessee is obtained. Also within Knox County the Volunteer Portland Cement Company erected a plant in 1927, and the product finds its way into many states in the country.

Along with the heretofore mentioned industries, it is well to bear in mind that the other industries such as beverages, bread, bakery products, concrete products, foundry products, lumber, timber products, machinery, machine shop products, printing, and publishing have had a profound influence, and have contributed to the stability which Knoxville enjoys.

V. As a Center for the Tennessee Valley Authority.

The Tennessee Valley Authority which centers in

the city was organized in 1933. The influence of this organization into the city has not been felt excepting for the increased sales of the local merchants, and rise in the cost of dwelling houses. Although at the start, a great deal of stress was placed on the exorbitant rents charged, an investigation revealed that rents were not out of proportion when compared with costs of other cities of comparable size. However, there was an increase in the costs of houses, which worked a hardship on those whose wages were not increased proportionately.

The future effect of this power development on the city cannot be told, although at the start there was a great deal of comment on how the supply of cheap hydro-electric power would attract industry to this section. To date, there is not one example of a permanent industry centering in the city as a result of this inducement except a manganese plant which at the present time is being operated for experimental purposes.

The Tennessee Valley Authority at the present time employs approximately 1400 to 1500 in the city of Knoxville, and about 1800 in the Knoxville area. Such a payroll certainly adds to the general income within the city, but with many of the employees having been brought in from other areas, the local conditions in regard to relief and unemployment has not been materially affected.

The feasibility of Knoxville as a center for the Tennessee Valley Authority has often been questioned, but the set-up seems, more or less, permanent as long as the project is in operation. The continuance of the Authority in this vicinity should affect the growth of the town as the influx of such a group of highly specialized individuals will influence future development and thought.

VI. As an Education Center.

The city of Knoxville represents one of the leading educational centers in the South. Within the city is located The University of Tennessee, and Knoxville College. The importance of the state university being located here cannot be definitely determined, as so many of the benefits are intangible. With 5,542² students enrolled in all the Knoxville departments at the University of Tennessee a considerable amount of business is brought into the city. Knoxville College, being exclusively for negroes, has an enrollment of 418³ students. Most of the students in this institution are residents of Knoxville, as those financially able to attend schools away from home attend universities in the North.

2. University of Tennessee Record, Register 1938-1939. Announcement 1939-1940, May, 1939. General Summary, p. 333.

3. Knoxville College Catalogue, 1938-1939, p. 72.

CHAPTER V

PATTERN OF OCCUPANCY

I. Site Pattern.

The city of Knoxville is situated on the Tennessee River. The major portion of the city is located on the north bank of the Tennessee River, and has been limited in an east-west direction of growth by the presence of southward-flowing creeks. The development of the city, can easily be associated with two well-grounded factors in the location of cities, in that: (1) "Cities tend to develop along rivers where the land is high enough to be above serious flood damage, but where access to the river front, and also to the uplands beyond the river valley, is easy," and (2) "Cities tend to develop on the outer curve of large bends in streams if there is easy access to the land area."¹

The early selection of the site for the original town, was largely determined by the two foregoing principles stated, but numerous other factors entered in. Of great importance in those early days was a consideration of the site from a military viewpoint. The region was one in which the Indians were none too friendly, and "survival

1. Ridgley, D. G., Geographic Principles in the Study of Cities, Jour. of Geog., Vol. 24, 1923, pp. 66-78.

of the fittest" was often determined by the best site and situation factors. The importance of a good supply of water was another factor, as typhoid germs were quite common in sections throughout the general area. The streams of the immediate locality headed in close proximity to the original town, and contamination was at a minimum.

The location of the original town on the north bank of the River, between First Creek and Second Creek, was logical. The area, enclosed on three sides by water was a compact one, serious topographic features did not interfere, and connections with other people of the immediate locality were made possible by the presence of streams. The area between Second Creek and Third Creek was less favorable due to physical features in regard to topography, and the region between First Creek and Williams Creek was an area too large, affording no advantages in addition to those that could be found in the area selected.

The terrain of the city is varied, ranging in elevation from 797.59 feet to 1110 feet above sea level. Much of the city is dissected by the numerous creeks and their tributaries. The relief is not only the result of surface erosional factors, but is also due to the underlying rock structure. The rocks that underlie the city proper are all of Paleozoic age and are comprised of

several different formations, namely: Rome, Knox dolomite, Chickamauga limestones, Holston marble, Tellico sandstones and shales, Ottesee shales, and the Bays sandstone.

The outstanding formation present in the city, and throughout the surrounding area, is the Knox dolomite. This formation occurs in two parallel belts, the one extending northeast to southwest through the northern section of the city in the vicinity of Lonsdale, the second belt underlying the main part of the city from Depot Avenue southeast to the river.

An outcrop of Knox dolomite can be seen in the neighborhood of the Peters and Bradley Milling Company, and proceeding toward the southeast, successively narrow beds of Lenoir limestones, Holston marble, Tellico sandstones, Ottesee shales, and Bays sandstone will be encountered. The last named beds, which are of lower Paleozoic age, are bounded on the southeast by the second belt of Knox dolomite. The formation again appearing at the surface due to a displacement along a fracture or faultplane, paralleling the other belt through the city in the area nearby the Southern Railway station.

With the presence of solution channels, and the possibility of further underground solution in this

underlying structure, engineering problems in the construction of large buildings are becoming more complicated. As the commercial area is limited by the presence of so many creeks, and ridges resulting from the beds of chert in the Knox dolomite, the above condition may tend to break up the central commercial and shopping district.

II. Street Pattern.

The street pattern of the city of Knoxville is one of a heterogeneous nature as the result of the incorporation of satellite communities to form the present city. With each additional area taken into the city, correlation of streets has been extremely difficult. Physical features often necessitated the "jogging" of streets to avoid steep gradients, and the presence of stream valleys often determined the main routes.

The street system is definitely characterized by a lack of one central pattern. Instead, the city has approximately eleven different sections about which the streets focus. In the regions comprising areas taken into the city in 1917 there has been an attempt at planning, but in the older and more highly developed portions, the streets are the same as in former days. This condition exists in practically all old cities, and the improvement of such streets seems out of the question with land values

so high. However, the usefulness of such streets can be facilitated by rerouting public transportation lines, and providing public parking grounds for automobiles thus leaving the entire street for motorists.

The area from Twenty-third Street to the intersection of Main and Vine Avenues, and from the Tennessee River northward to Vine Avenue and Grand Avenue further west, constitutes the core about which all the street patterns in general tie up. In this area, the streets are so constructed that practically all of them intersect at right angles. This section carries the greatest amount of traffic in the city, and although streets are so arranged that traffic flow should be easy, congestion is a common occurrence due to the street's extreme narrowness. The only two streets of sufficient width, Henley Street and Cumberland Avenue (Main in downtown area), are so located on the periphery of the commercial area and connect with the less densely populated portions of the city, that the effectiveness of their width is not as great as if they connected more densely populated areas.

Vine Avenue northward to Bluff Street, between Broadway and First Creek, represents a second definite street system. The streets in the southern portion of this area are correlated with the major streets of the central

region, but from Lovenia Avenue northward, the major streets come in at oblique angles.

East of this pattern, lying between the main line of the Southern Railway on the north, and Brooks Avenue on the south, is one of the best planned street systems in the city. The streets are fairly wide, and what discrepancies there are in regard to regularity can be attributed to relief.

North of the region described, and east of Central Avenue Pike are three areas in which pattern varies considerably. From the old Gray Cemetery following Broadway to Ledgerwood Avenue, and thence westwardly to the Southern Railway line, and following the railway line to the starting point is another well-planned section of the city. Here the streets intersect at right angles, and the greatest difficulty encountered is the fact that the blocks are of unequal lengths, thus causing a considerable number of streets to terminate in dead ends.

West of Broadway and north of Ledgerwood Avenue to the city limits is an area in which street pattern is largely determined by the pre-existing railway line. Some of the streets intersect at right angles, some at oblique angles, and others at points that seem convenient.

Most of the streets in this general area connect with the north end of Broadway, thus giving rise to a commercial district, as the trend of the streets is away from the older sections of the city.

The region lying north of the Southern Railway line to Bristol and east of Broadway represents an area in which the street pattern is the result of attempts to match the streets of the neighboring areas that were developed at an earlier date. In the southern portion regularity is noticeable, while in the other parts streets exist wherever connections can be made with Broadway.

West of Second Creek and north of New York Avenue is an area in which three sets of parallel blocks meet obliquely to each other. As a result, dead-end streets, irregular length of blocks, and crooked streets are in evidence. The streets in general are poorly taken care of, as the region is in close proximity to the Coster Railway Shops, which represents an industrial area.

Directly south of this section, between the Louisville and Nashville Railway line on the west, and the Southern on the east, to Dale Avenue on the south, is the most poorly planned section in the city. Streets intersect at all angles, and connections with streets in other areas are obstructed in all directions by railway lines. The

surface features do not readily lend themselves to the building of roads, and as the region is occupied principally by negroes, public interest in planning has been very slight.

In the extreme western portion of the city west of the New Gray Cemetery between Western and Keith Avenues, is a new development in which regularity is prevalent. Such a planned section, in an area which is so badly cut up, has little real value as it does not fit in with the existing pattern, and does not connect with other conformable districts.

South of Kingston Pike, between Third Creek and the city limits on the west, is a street system which is not in any sense connected with the heretofore mentioned systems. The main roads within the area connect with the Kingston Pike, and the roads curve frequently following the bend of the Tennessee River. This area represents the highest type of residential section within Knoxville, and winding boulevards predominate.

In that portion of the city south of the Tennessee River, the streets are badly broken up, and in only a few cases are sections fairly regular. However, such planning can be understood when the rough topography is observed, and the fact that a definite attempt has been made to

develop a residential section distant from the river similar in plan to that employed in Sequoyia Hills.

Surrounding the areas mentioned, are numerous other streets that can hardly be considered systems or patterns. These regions are undeveloped, and where streets do exist they are mainly connecting links between the more highly developed sections of the city.

III. Commercial Pattern.

The commercial pattern of Knoxville is marked by its extreme centralization in the region between First Creek and Second Creek in close proximity to the Tennessee River. From this area scattered commercial areas exist along the streets radiating from this center, and the size and importance of such districts are in proportion to the age and position of that section of the city. The advantage of an early start is the important agent in such localization, as evidenced by comparing the map on Land Utilization with that of the map on the Areal Extension of City Limits.

The most important commercial district within the city lies between Vine Avenue on the north, and Main Avenue on the south, between Locust Street and Central Avenue. In this area are located the largest department stores, banks, restaurants, hardware houses, the central bus terminal, and miscellaneous enterprises that constitute a



GAY STREET

THE HEART OF THE COMMERCIAL AREA

commercial center. Outside of this district are the commercial districts which require relatively large areas to carry on their business such as used-car lots, dry-cleaning establishments, and those businesses which cannot stand extremely high overhead expenses such as grocery stores, gasoline stations, garages, etc.

Knoxville is fundamentally a one-street town, and the extreme utilization of Gay Street has made that street the core of the city. Outside of the Gay Street area, little commercial activity takes place, excepting that connected with food purchases, and those stores in which merchandise turn-over is less rapid.

IV. Residential Pattern.

The residential pattern of Knoxville is composed of a central residential area, encircling the central commercial district, and five areas extending from this center. The central residential district is bounded on the south by the Tennessee River, on the north by University Avenue and East Fifth Avenue, on the west by Third Creek, and on the east by First Creek.

One residential district extends westward from the central area, south of Kingston Pike, two northward being separated by the Coster Railway Shops, one eastward along Magnolia Avenue, and one projects southward on the south

side of the River. The size and development of these outlying residential districts vary considerably, as those areas to the north comprise residences of the middle class, with some slum and negro areas which would show a high average number of persons per unit of land. The largest residential expansion in regard to area has taken place in the eastern and western parts of the city, and constitute areas of the higher middle class homes and the highest type houses within the corporate limits. South of the River residential expansion has taken place more slowly, although negroes in this region are very scarce. In this vicinity two high-type districts have developed, one in the vicinity of Woodlawn Pike, and the other north of Island Home Avenue near Riverview Drive. The newer residential districts are practically free of negroes, excepting in the extreme northwestern part of the city, as the residences given up by the whites in this outward expansion have been taken over. As a result, there is a concentration of negro residences to the southeast and northwest of the central commercial area.

The residential pattern of the city has shifted considerably with the areal expansion of the city limits. Numerous communities, now comprising middle and lower class sections, constituted the highest type communities, and

this shifting is still going on. The newer residential areas are now on the outer zone of the city, and those formerly in the central portion have been converted into middle-class communities. The greatest direction of movement has been to the east and west, as evidenced by the development of the Sequoyia Hills section, and the Holston Hills area west of Chilhowee Park in the vicinity of Magnolia Avenue. From the direction of growth in the past, and the presence of unoccupied lands within the city at present, the negro communities will be located in central and northwest Knoxville, and the newer white communities in the east, northeast, west, and southern portions.

V. Railroad Pattern.

The railroads entering the city of Knoxville, come in mainly from the east, west, south, and north and terminate in the south-central portion of the city. The line of the Southern Railway from Chattanooga enters the city from the west on the Kingston Pike at the intersection of Carr Street. Also coming in from the west is a line of the Louisville and Nashville Railway which crosses the city limits almost at the intersection of Keith and Middlebrook Avenues. From the northwest, another line of the Southern enters the city north of Watauga Avenue and east of Central Avenue Pike, where within a short distance connections are made with the Coaster Railway Shops which are maintained by



LOUISVILLE AND NASHVILLE RAILWAY
YARDS AND TERMINALS

the Southern Railway Company. From the north, a line of the Southern crosses the corporate limits a short distance north of Broadway, where an overhead crosses the street. From the east, the main line of the Southern from Bristol, Tennessee enters the city north of Chilhowee Park (Sterchi), and follows a northwesterly direction to the vicinity of 9th Avenue. From here the line cuts southwestwardly, and thence northwestwardly again, bounding Caswell Park on the north and west. In this section the railway curves south and then northwestwardly again to the railway terminal. Such irregularities in the route being the result of problems presented by the presence of First Creek. From the south, the Southern line enters the city and follows Railroad Avenue to Chapel Lane and then turns northwestward cutting across Blount Avenue. West of the Henley Street Bridge, a railway bridge provides passage of the line across the Tennessee River, and after crossing the river the line parallels the east side of Second Creek to the terminal. The line of the Louisville and Nashville Railway entering from the south, crosses the city limits at the western end of Angelina Drive. From here the line continues northwestwardly to Railroad Avenue, where the tracks follow those of the Southern to the vicinity west of Baldwin

Avenue. Here the railway branches northwestward crossing the River by means of a bridge farther west than that of the Southern. On the north side of the River the line branches: one line turning north making connections with the Louisville and Nashville terminal; the other, west connecting with the line to Harriman, Tennessee.

VI. Manufacturing Pattern.

The manufacturing pattern of Knoxville practically coincides with the railway pattern. The heavy industries are all located on a main line of one of the railways or on a spur line. The city has four well developed manufacturing areas. The manufacturing district in the northwestern part of the city is known as the Lonsdale section, and the establishments follow the line of the Louisville and Nashville Railway, and trend in a northerly direction along the line of the Southern. In the south-central portion of the city, close to the railway terminals numerous manufacturing plants have been established and here are located the greater portion of the city's establishments. In the north-central part of the city numerous plants have been located, following the main line of the Southern Railway to Kingsport. South of the Tennessee River a few scattered plants are now in operation, and industrial development in this section can

be looked forward to due to feasible railway connections, plus the fact that the area is not highly developed and home sites are not at a premium in this vicinity.

VII. Stages in Evolution of the City Pattern.

The city of Knoxville was founded in 1791, and at that time consisted of sixteen blocks. The town fronted on the Tennessee River, and the main street of that day has continued to be the major one. In 1795 the limits of the city were extended to Clinch Avenue on the north, and present-day Henley Street on the west.

For the next twenty years, extension of the corporate limits did not take place, and then, when the limits were extended in 1815, only a small territory was added. The topographic features of the region were definitely limiting, as incorporation of areas across either First or Second Creek meant increased costs of city government. As a result, the boundary of Knoxville was marked by Second Creek on the west, and First Creek on the east, with northward expansion to Vine Avenue.

In 1855 the town practically doubled in size. The northern boundary was extended to the Old Gray Cemetery and then eastward to a point where, today, the Southern Railway crosses First Creek. Although many individuals

fail to visualize geographic factors, surely the men who framed the act extending the city limits did not.

Commencing at a low-water mark on the Holston River, and at the mouth of First Creek, thence up the west bank of said creek, with the various meanders thereof, to the point where the East Tennessee and Virginia Railroad crosses said creek; thence, westwardly a direct line to the east bank of Second Creek, at a point on John Dawson's land, so as to include the grounds of 'Gray's Cemetery' within said corporation; thence, down said east bank of said Second Creek to the mouth thereof at low-water mark in Holston River; thence, up said river, with its various meanders at low-water mark, to the beginning;²

In 1868 the town of East Knoxville was abolished and taken into the city of Knoxville.³ This additional territory, once more placed the limits of the city in a rough rectangular shape, and meant additional expenditures to bridge First Creek. Also it was the forerunner of planning problems, as the street patterns of the two towns did not coincide, necessitating the construction of blocks of various sizes and shapes.

With the addition of East Knoxville, and expansion necessary, the town added a small territory lying northwest of the original city, across Second Creek, in 1882. Here

2. Tennessee Acts, 1855, Knoxville Corporate Limits Extended, Ch. 21, p. 24, Dec. 20, 1855.

3. Tennessee Acts, 1868, Ch. 16, pp. 109-10, Dec. 17, 1868.

also, street correlation led to a distortion of the original pattern, which of late, has been a great problem in trying to plan streets capable of handling modern transportation vehicles.

In 1897 two areas contiguous to the city were taken in. The region to the north was bounded on the west by Second Creek, and on the northeast by First Creek. The street pattern was tied in with that of the territory taken in in 1855, and as a result such discrepancies in pattern as there may have been were extended. The other area, taken into the city at this time, was that area between Second and Third Creeks, with the Southern Railway line to Chattanooga marking the northern boundary, and the Tennessee River the boundary on the south.

From 1897 to 1917 no additional territory was added, but during this period numerous satellite towns were established near the city. Then with the inclusion of these towns, Knoxville's area was increased from 3.97 square miles to 26.34 square miles. Such an expansion does have its advantages, but it is now a problem for the city to maintain roads, provide sewer systems, give police and fire protection, which is extremely costly when so much of the area is undeveloped.

Since that time no further expansion has taken place, although areas close by the city, such as Fountain City, are building up. To include these within the corporate limits seems inevitable, but to attempt to take them in now is out of the question. Unfavorable topographic features are taking its toll in Knoxville, by the fact that overcoming these means great expenditures by the city, and high taxes sounds the death knell to industry.

CHAPTER VI

LAND UTILIZATION

I. Land Utilized for Residential Purposes.

The land utilized for residential purposes within the city consists of less than half of the total land area. Two major divisions of residential land use are made on the basis of the color of the occupants, while these areas occupied by the whites are divided into three groups on a basis of value, namely, A-type, B-type, and C-type. Those regions in which negro residences predominate will form the D-type class.

The A-type residential communities consist of those areas occupied by white inhabitants, having a value of \$10,000 or more (designated by pink on Land Utilization map). Within the city are eight areas that are included within such limits. These areas, in general, consist of those portions of the city, farthest distant from industrial sections, rich in natural beauty, free from frequent inundations, and house the most well-to-do people.

The B-type residential communities refers to those sections occupied by white occupants, in which the residences range in value from \$2,500 to \$10,000 (designated by orange on the Land Utilization map). This type of community comprises more than half of the entire land

HIGH TYPE RESIDENCES IN KNOXVILLE

61A



REPRESENTATIVE MIDDLE-CLASS RESIDENCES

61 B





3 STORY, MODERATE PRICED TENEMENT

MADE IN U.S.A.

area used for residential purposes, and to a large degree separates the A-type community from the C-type and D-type. As to location these communities are second to those of the A-type. As to the type of structures within these areas, they show adjustment to the prevailing type of material used according to the age of the community. In the older districts, wood structures predominate, but newer areas are being built mainly of brick and stone. Within the city are eleven communities of the B-type, and variations between sections are in some cases great in regard to valuation. This type community houses the higher salaried group of people in the city.

The C-type community consists of those sections of the city occupied by white occupants in which the total value of the property is \$2500 or less (designated by black on Land Utilization Map). These communities occupy the least desirable portions of the city, and although the number of such areas is small, conditions within such regions are deplorable. The buildings are of the poorest type, often the result of the cheapest construction or else the result of general deterioration. Such communities are in close proximity to the central commercial district, and their elimination will come only as the result of an expanded commercial area. This condition being brought about as the areas occupied



SLUMS UNDER BEAUTIFUL HILL STREET VIADUCT

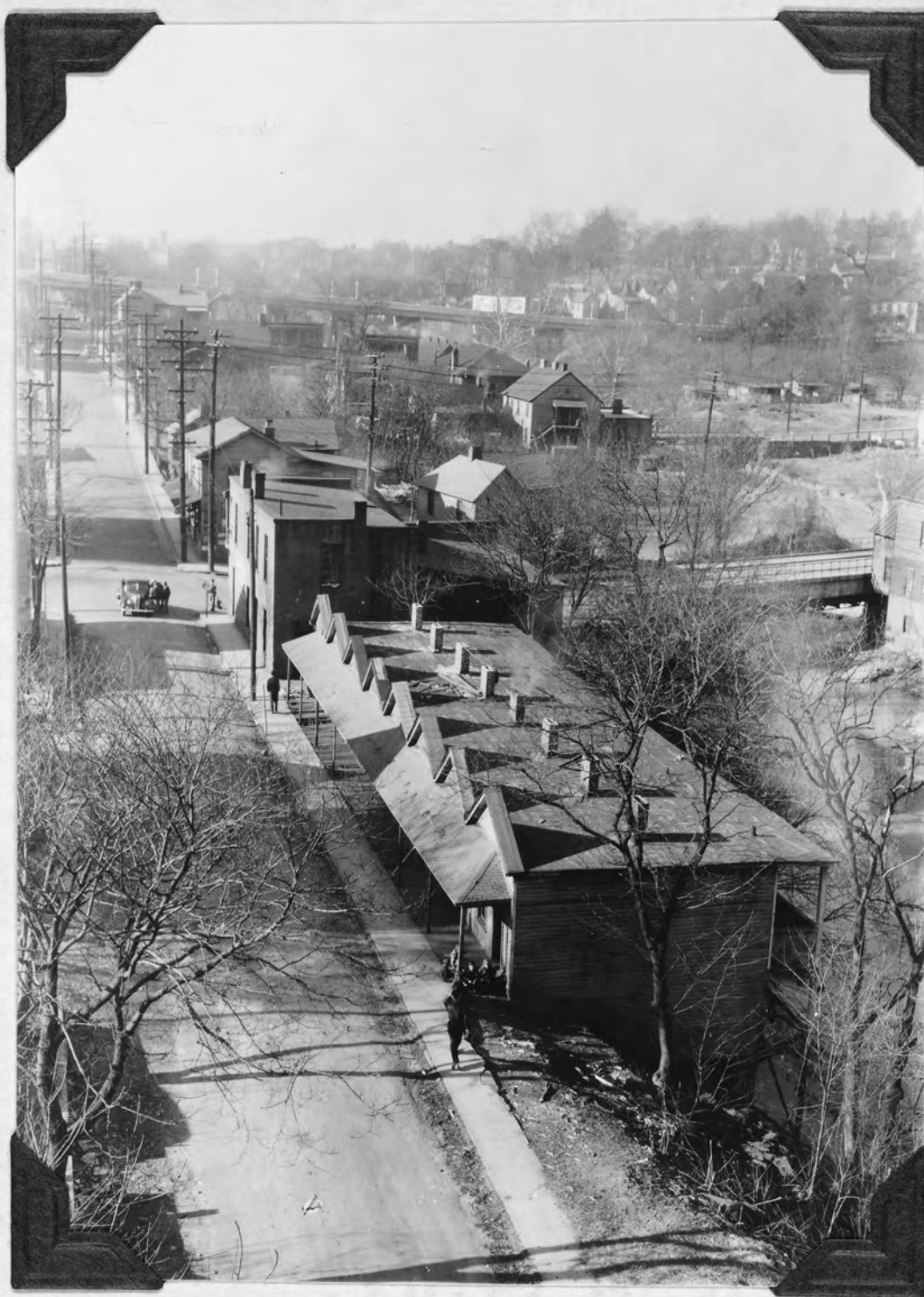


A TYPICAL WASHDAY IN KNOXVILLE'S LANE STREET SLUMS

by such communities are not desirable homesites, and the homes are in such condition that the great amount necessary for improvement would not justify the expenditure from an investment angle. In other sections, B-type communities have been forced into the C-type, by encroachment on these areas by the negroes, as is the case in the region between Knoxville College and the Old Gray Cemetery. One of the regions included within this C-type group, is being eliminated by a slum clearance program, being carried on by the Knoxville Housing Authority. In numerous instances, B-type communities are being decreased in value by natural deterioration and the influx of negroes into surrounding areas. This type of community houses the lower salaried workers in the city, many of whom are unskilled.

The D-type community refers to those portions of the city, occupied by negroes, irrespective of property value (designated by blue on Land Utilization Map). Unlike so many cities, the negro communities do not necessarily occupy the least desirable areas. The region to the northwest of the central portion of the city occupied by negroes is a highland area, and from present-day standards quite desirable for homesites. In the early history of Knoxville, horses and buggies were the chief means of travel and walking often

resorted to. Level land was at a premium, and the negroes were forced onto the adjoining hilly lands which, with the development of new means of travel, have become highly favorable. From the beginning, the houses in this section have been of the poorest type, being constructed of unfinished lumber loosely thrown together and stripped. However, the houses on the outer edge of the present D-type community consist of many houses of older C-type communities as a result of many white people moving out because of the nearness to negro residences. In the region southeast of the central commercial district is another D-type community which has grown in the past few years by encirclement of B- and C-type residences. Although encroachment upon the A-type community seems inevitable in this general area, by a look at the Land Utilization map, such does not seem to be the case when the topography of the area is scrutinized. The area is, more or less, set off by hills and a high class B-type community which acts as a buffer. In other sections of the city, D-type communities are coming into existence near the industrial centers, and such movement causes considerable problems as land values are largely governed by this factor. Barrack-type flats and "shot-gun" houses are in evidence in many sections of the city, and many of the residences are soon robbed of



BARRACKS-TYPE HOUSES ALONG FIRST CREEK



ROW OF "SHOT GUN" HOUSES ON KING STREET

64B



SLUM TENEMENT HOUSING OVER SIXTY PEOPLE
ON EAST VINE



2 ROOM, SUB-STANDARD HOUSE, FOR RENT

64 C



SLUMS ALONG THE TENNESSEE RIVER



HOUSE NEAR CORNER OF HENLEY STREET AND
CLINCH AVENUE

their usefulness by overcrowding. In 1930, 17,093 individuals were housed under these conditions.

II. Lands Utilized for Public Purposes.

The lands utilized for public purposes within the city comprise all lands used for churches, schools, recreational purposes, waterworks, fire halls, hospitals, incinerators, dumps, and cemeteries. The lands consist of any parcels not held or owned by any individual or corporation, open for use by and for the general public.

The churches within the city constitute the greatest number of parcels of land used for any specialized public purpose. There are 186 churches within the corporate limits, of which 133 are for the whites, and 53 for the negroes. Although no attempt is made to point out church membership, it is of interest to note the following denominations in the community having churches for the white people: (1) Adventists, one; (2) Baptists, forty-two; (3) Catholic, two; (4) Christian, five; (5) Christian Scientists, two; (6) Episcopal, two; (7) Friends, one; (8) Hebrews, one temple, and one synagogue; (9) Lutherans, two; (10) Mennonites, one; (11) all Methodist churches including Methodist Episcopal, Methodist Episcopal, Southern, and Wesleyan Methodists, thirty; (12) Nazarenes, one; (13) Presbyterian, nine; (14) United Brethern, four;

and (15) Undenominational, twenty-nine. The negro churches represent six denominations, and fifteen churches considered undenominational. The churches are: (1) Adventists, one; (2) Baptists, seventeen; (3) Christian, one; (4) Episcopal, one; (5) Methodist Episcopal, South, thirteen; (6) Presbyterian, five; and, (7) Undenominational, fifteen. Based on the population reported for 1930, the number of churches for negroes are twice as numerous in proportion to the population as for the white people. The spacing of the churches varies proportionately, as the area occupied by the negroes is small when compared with the white sections. Also there has been a greater expansion of white church sites along with the extension of white residential sections, a condition that has not taken place so greatly in negro areas as expansion has not taken place as rapidly due to a more complete utilization of the areas occupied by the negroes.

The schools in the city of Knoxville consist of a university, a college, the high schools, the junior-high schools, the junior-senior schools, the elementary schools, and numerous private educational institutions.

The location of the University of Tennessee, on West Cumberland Avenue west of Second Creek, was largely a matter of chance. At the time of the school's founding in 1794, this area was distant from the business district

of the town and was in an outlying district. Knoxville College is well situated in the center of a negro district. Functional factors were considered in the location of Knoxville College, but with an inclosing commercial area as is the case around the University of Tennessee, a far-sighted plan must be instigated taking into consideration future development.

Within the city are two high schools for white children, Knoxville High and Stair Technical, and one for negroes, Austin High School. There are two junior-high schools for whites, Christenberry and Park Junior High Schools, and four junior-senior schools, of which Rule, South Knoxville, and Tyson are for the white, and Mechanicsville for the negroes. The elementary set-up consists of thirty-five schools, ten of which are for the negroes. In addition to the public school program are seven schools sponsored by religious sects. The location of the schools is largely determined by the population of the surrounding neighborhoods, and there is a general concentration in the area north of the central commercial area. The number of schools in the northeastern part of the city is a criteria for expecting future development in that direction. The scarcity of school buildings in the extreme eastern and western part of the city is largely determined by having regulations

(city zoning) which guard against crowding, and the school population in those areas is liable to remain fairly constant.

The lands utilized for recreational purposes within the city are extremely limited, and consist of twenty-seven tracts set aside for that purpose. The size of these areas vary from one-eighth acre (park at Market Street and Vine Avenue) to one-hundred acres (Municipal Golf Course). The limitations placed upon the recreational department has resulted in an attempt to satisfy the needs and demands of the community utilizing present resources. The exclusion of expenditures for future requirements will bring about more problems, and will place future city governments in a dilemma greater than that which they are in at the present time. The city maintains an amusement park (Ghilhowee Park), a municipal golf course, and twenty-four parcels of land that defy classification between real parks, playgrounds, and vacant lots. To be more concise, below are listed the properties considered parks, giving areas, and equipment:

Alexander Park

- a. size - 300' x 250'
- b. equipment
 - 1) 2 ball diamonds
 - 2) 1 giant stride
 - 3) 1 set swings
 - 4) 1 slide

Caswell Park

- a. size - 22.5 acres
- b. equipment
 - 1) Smithsonian Stadium
 - 2) Tennis court
 - 3) softball diamond

Chavannes Park

- a. size - 500' x 150'
- b. equipment
 - 1) 1 slide
 - 2) 4 sets see-saws
 - 3) 1 set swings
 - 4) 1 tennis court
 - 5) 1 wading pool

Circle Park

- a. size - 500' (2 A.)

City Hall Park

- a. size - 7.22 A.

East Hill Park

- a. size - 86' x 240'

Emery Park

- a. size - 1/4 A.

Forest Glenn Park

- a. size - small triangle

Hensley Park

- a. size - small triangle

John Lee Park

- a. size - 1-1/2 A.

Lyon's Field

- a. size - several acres
- b. equipment
 - 1) 3 tennis courts
 - 2) 3 softball diamonds
 - 3) 1 handball diamond

Market and Vine Park

- a. size - 1/8 A.

North Central Park

- a. size - 1-1/4 A.
- b. equipment
 - 1) 1 baseball diamond
 - 2) 1 basketball diamond
 - 3) 3 tennis courts
 - 4) 1 set swings
 - 5) 1 slide
 - 6) 1 horizontal bar.

Serugg's Park

- a. size - 1.6 A.
- b. equipment
 - 1) 1 baseball diamond
 - 2) 2 tennis courts
 - 3) 1 set swings
 - 4) 1 slide
 - 5) 1 giant slide

South Knoxville Park

- a. size - 3-1/4 A.
- b. equipment
 - 1) 1 softball diamond
 - 2) 1 set swings
 - 3) 4 see-saws
 - 4) 1 giant stride

Tallahie Park (Cherokee Blvd.)

- a. size - 8.3 A.
- b. No playground

Tyson Park (Kingston Pike)

- a. size - 22 A.
- b. equipment
 - 1) 8 tennis courts
 - 2) 1 softball field

Union Square Park

- a. size - .83 A.
- b. equipment
 - 1) 1 set swings
 - 2) 1 horizontal bar
 - 3) 1 giant stride
 - 4) 1 slide

Rose Bowl (West Clinch Ave.)

- a. size - 2.5 A.
- b. equipment
 - 1) floodlights
 No playground

White Circle Park

- a. size - 2 A.
- No playground

Recreation - Colored

Cal Johnson Park

- a. size - 5.23 A.
- b. equipment
 - 1) swings
 - 2) 1 giant stride
 - 3) 2 tennis courts
 - 4) 1 softball diamond

Larah Street Park

- a. size - 2 A.
- b. No playground
Not developed in any way

Leslie Street Park

- a. size - 21.69 A.
- b. equipment
 - 1) 1 hardball diamond
 - 2) stadium (pool)
 - 3) Developed park further up on hill
 - 1 slide
 - 1 set swings
 - 1 see-saw
 - 2 tennis courts

East Port Park (city provided and keeps park
up on property near East Port School)

- a. size -
- b. equipment
 - 1) 2 tennis courts
 - 2) 1 softball field

70 A



OTTOSEE LAKE IN CHILHOWEE PARK



SHELTER HOUSE AT TYSON PARK

The spacing of the parks throughout the city has not been planned, and as a result some of the parks are so located that they are not accessible to those requiring such play areas. The development of the Winona project is a great step forward, as here will be available six asphalt emulsion tennis courts suitable for night use, four lighted softball fields, a stadium seating approximately five-thousand persons, a football field, and a running track. The adoption of a means for lighting these areas is a real contribution, as it provides recreational facilities for those busily engaged during the day.

The development of a planned park program in Knoxville is a necessity, but winning the public support for such a plan which necessitates great expenditures is a factor that is not easily overcome. Too often individuals give the argument that the city is small enough, that park advantages can be obtained by getting outside the city limits or by utilizing vacant land within the city; that children do not want supervised play, but would rather be left alone to act as they please; that the greater portion of the expense would fall on those individuals who have already invested their earnings in property for the development of Knoxville, upon which, of late, they have received nothing but tax bills; and the

NECESSARY REMEDIAL MEASURES IN THE PUBLIC PARKS



DUMP AT CHILHOWEE PARK

This dump not only detracts from the beauty of the park, but is a menace to health. The City should prohibit the dumping of decayable matter here.



RUSTIC BRIDGE IN TYSON PARK

The condition of the water passing under this structure makes it unfit for wading purposes. The contamination of this water by acid and marble dust should not be tolerated.

areas developed would be only for a few, which would constitute a subsidy for those individuals engaging in that particular activity.

These and a myriad other arguments against such a program can be given, and often with sincerity that cannot be doubted. However, it must be borne in mind that Knoxville is not a static community and that future development of the city will make such a program extremely expensive. "Cities which lack landscape park areas - such as Knoxville, Tennessee, which has no wooded park areas at all - would do well to acquire available lands now lying undeveloped before suburban growth makes this impossible or prohibitively expensive."¹ The value of a park system from a safety angle alone would justify the necessary expenditures, as at the present time and particularly during the vacation periods, children playing in the streets present a serious hazard to the motorist.

The land utilized for waterworks in Knoxville consists mainly of a municipal waterworks plant and numerous reservoirs located throughout the city. The municipal plant is located on the north side of the Tennessee River, and receives its supply of water from the

1. Hubbard and Hubbard, Our Cities of Today and Tomorrow, (Cambridge; Harvard University Press, 1929), p. 352.

Tennessee. The plant was constructed in 1927, and was enlarged this year. At present it consists of a 15 million gallon filtration plant, and two pumps of 15 million gallon capacity, to which a third pump of the same size is being added. From this plant water is being pumped through 285 miles of underground water mains, varying in diameter from six to forty-eight inches.

Within the city are eleven fire stations, with the greater portion located within the central part. The city maintains one aerial track company on Commerce Avenue, which provides adequate protection for the downtown area. The other fire stations are fairly well spaced throughout the city, in accordance with land usage.

The hospitals within the city consist mainly of the Knoxville General Hospital, Fort Sanders Hospital, and St. Mary's Memorial Hospital. In addition, hospitals are maintained by the University of Tennessee, Knoxville College, and there are numerous private infirmaries. The location of these does not follow any set plan, as the north, east, and southern portions of the city are not in close connection with any of them.

The lands utilized for incinerators and dumps are, for the most part, located in the outer portion of the

city. In these areas the unsightly appearance and odors are least obnoxious, and the lands so used are unfit for urban land use at present. In the rear of Chilhowee Park is a temporary dump that is greatly detracting from the beauty of that area. In fact, it is really a menace to the public health, as the material deposited consists of all kinds of refuse, and is not limited to rubbish that will not spoil. The dump is a "pest-hole", and the conditions that now exist there, are as detrimental as those that they are trying to eliminate.

The cemeteries within the city consist of many small ones, maintained by former church and civic groups. Those cemeteries of any considerable size are located north of the central commercial district, and to the northwest part of the city as in the case of the New Gray Cemetery, and to the northeast as in the case of the Lymhurst development. For the most part, the cemeteries were in existence as long as the city, and their location in various parts of the city have kept pace with the city's expansion.

III. Lands Utilized for Commercial Purposes.

The lands utilized for commercial purposes in Knoxville comprise only a very small percentage of the

total land area. The areas are made up of numerous isolated tracts, but can be placed in three categories, namely: (1) central commercial area; (2) a transitional belt; and, (3) the outlying commercial areas. The central commercial area, consists of the major commercial area bordering Gay Street; the transitional belt refers to that region of commercial activity on the border of the central commercial area in which a great number of the commission and wholesale establishments are located; and the outlying commercial areas have reference to all the other commercial enterprises carried on outside these regions.

The buildings within the various commercial districts definitely reflect the type of activity carried on. The central commercial area presents buildings of the latest design, superimposed, in many cases on older structures, housing in addition to the retail stores, offices, living quarters, studios, and clubrooms. The transitional belt consists of larger buildings which provide greater storage space, interspersed with the smaller industrial concerns. The buildings of the outlying commercial areas, in many cases, are those converted into stores from former dwelling houses. In instances where buildings have been built specifically for commercial purposes, provision has been made to utilize the upper part of the buildings for offices

and apartments. The intense utilization of the central commercial area and the transitional belt reflects the importance of Knoxville as a commercial center.

A. Central Commercial Area.

The central commercial area consists of that portion of the city lying between West Main and Vine Avenues on the north and south, and Henley and State Streets on the west and east. Within this concentrated area, the greater portion of the city's commercial activity takes place. The region from the beginning was highly important, as the district is located on a terrace-like area, with the surrounding area somewhat cut off by streams. Due to this topographic feature, the central area has been intensively utilized and further intensification of land use can be expected as a shifting from this area does not seem practicable.

The use of the land within the central commercial area can be classified according to function, as, retail sales stores, sales storage, personal service stores, light manufacturing, offices, public uses, and vacant areas. The use to which the land is put within the district is determined largely by potential customers and climatic conditions.

The main reason for the location of most of the department stores, apparel stores, and specialty-goods stores on the west side of the streets is that most of the people walk on that side. This statement can be verified by counting the number of pedestrians on each side of the street on any day. In the early hours of the morning more people use the east side of the street, but by early noon the reverse is the truth. The great importance of being located in the shade in a city like Knoxville can better be understood when summer temperatures are taken into consideration. As women make the greater majority of the family purchases, and usually in the afternoon, due to household duties that keep them home in the morning, such a locational factor plays a great part. As a result, such stores that depend a great deal on impromptu buying such as ladies' apparel, cosmetics, and specialty goods are located where window-shopping is most convenient. Those stores such as hardware and furniture stores which are not governed to such a large extent by such factors do not necessarily occupy such favorable locations as purchases are based primarily on the reputation of the establishment concerned.

After the establishment of the department stores,

apparel stores, and specialty stores on the west side of the street, the force of convenience added to the attractiveness of that side of the street. To engage in the commercial activity it became necessary for other establishments to locate on the west side. With such additions, convenience was not only accentuated, but prestige was added. The restaurants and food stores are not to be found on the west side of Gay Street between Clinch and Wall Avenues, as this represents the highest rental section in the city, and advantage is taken of the lower rents and taxes on the east side of the street, and on streets radiating from this district.

The amount of space devoted to sales storage will vary directly with the number of stores occupying any section of the business district. The space devoted to this purpose, refers to any part of sales buildings used for storage purposes, which merchandise is moved later to the sales floor. In most cases, such storage spaces are to be found on the upper floors, although the larger merchandise houses are now eliminating a great deal of this space by having warehouses located outside the commercial areas.

Personal service functions, which consist of

eating-houses, hotels, barber and beauty shops, and theaters in this portion of the city are all located on the east side of Gay Street, excepting one theater, and those stores requiring only a small space which can use the upper floors on the south side of the street. The factors behind such locations being that window-shopping is not so essential in determining purchases, and the advantage of lower rents. In no instance, are there any hotels to be found on the west side of Gay Street between Clinch and Wall Avenues.

As to the areas utilized for manufacturing in the downtown district, only a very limited portion might be considered. In most cases, such manufacturing as is carried on could better be classified under personal service, sales, or office space as the manufacturing is more closely related with these functions.

The land devoted to offices in the central commercial area is located on the east side of Gay Street in the high rent area, excepting in cases where the upper floors of bank buildings are planned for such purposes, and in areas outside of this limited district. Cheaper land, lower rents and taxes, and less competition for space for sales functions account for such locations.

The section of Gay Street, previously described, offers little in the way of public uses. A few lodge halls are scattered throughout the district, with greater spaces devoted to such purposes on the periphery of the central commercial area. The extreme rarity of such public places, is mainly due to the fact that public functions cannot support themselves when faced with heavy rents in the central commercial area.

The residential space units in the district are all confined to the upper floors of buildings, in which the lower part is used for sales purposes. Also there is an increase in land devoted to such usage on the margins of the district, which represents a decrease in rental values.

As to the vacant areas within the district, the west side of Gay Street is relatively low in vacant areas. With the current business recession, those stores that were forced out on the west side, were immediately filled by the fact that the west side offered advantages that could not be duplicated on the east side.

So far the discussion has been limited largely to the Gay Street section between Clinch and Wall Avenues. Those two blocks represent the region of greatest commercial activity, although a great deal of business is carried on outside this immediate locality. On both sides of Gay

Street, from West Main Street to Vine Avenue, stores are in evidence. The type of store differs radically, as many less specialized ones are in evidence with many eating-houses, pool rooms, and automobile sales rooms on both sides of the street.

The streets running in a north-south direction through the central commercial area, are much less important than those paralleling Gay Street. This may partially be explained by the fact that the buildings fronting on Gay Street extend for considerable distances along these streets, and business accruing from these districts is included under Gay Street functions. In addition, much of the space along these streets is owned and utilized by churches, semi-public institutions, garages, parking lots, and personal service stores which would detract from functional conveniences found on Gay Street.

Between Union and Wall Avenues on Market Street is a marketing area that plays an important part in Knoxville's commercial life. In the early days of Knoxville this site was set aside, and used as a town hall and public market, Today this area still serves as a retail produce market for local farmers, and the hall has been converted into a market house. Encircling the entire area, a commercial

area has grown up quite distinct from that of the near-by areas, in which goods of a less specialized class and lower price are sold, in response to a limited market presented by the weekly influx of farmers to the city.

B. The Transitional Belt.

The transitional belt consists of three prongs which radiate from the central commercial area to the north, northwest, and west. The uses to which the land is utilized is so varied that classification is impracticable. The areas are not only used for a large number of purposes, but are undergoing rapid transition. Dwelling houses are being replaced by business establishments, and the greatest development is taking place along those streets leading out from the central commercial area.

The area along Western Avenue, west of the Southern Railway Station, represents the largest negro commercial district of the city. This area lies between the central commercial area on the east, and the largest negro residential section on the west. The type of stores and merchandise displayed is typical of such a commercial center, as evidenced by the many sidewalk displays, and second-hand merchandise houses.

Within this belt are located the major wholesale

and warehouse districts. The location of such establishments was mainly due to the fact that with the coming of the railroads, spur lines could easily be built to this area, and at that early date the area invited those industries requiring plenty of space for buildings, warehouses, and yards.

C. Outlying Districts.

The outlying commercial districts consist of those areas in which commercial activity takes place outside of the central and transitional commercial areas. Within these districts are located the principal grocery stores, drug stores, automobile sales establishments, both new and second-hand, gasoline receiving plants, bulk distributing plants, and filling stations. The location and distribution of such businesses is determined by market, transportation facilities, and purchasing power of the neighborhood as reflected in the type of merchandise and stores in the various sections.

IV. Land Utilized for Railways.

The lands utilized for railway purposes in the city of Knoxville consist of only a small percentage of the total land area. The railroad lands consist of the various freight and passenger terminals, the right-of-ways of the main and spur lines, and freight yards.

The depots within the city are located on the west and north of the central commercial area, between the commercial and industrial districts. The Southern Railway and the Louisville and Nashville each maintains its own passenger and freight stations. The depot for the Southern Railway is located between Jackson and Depot Avenues, bounded on the west by Broadway and on the east by Central Avenue. The terminal of the Louisville and Nashville Railway is located southwest of the Southern station, between Western Avenue and Clinch Avenue, just west of Second Creek. The localization of the terminals in this general area is largely the result of site attraction, functional magnetism, and functional convenience.

The spur lines within the city comprise 25 miles of lines which for the most part, lie along the main lines serving the industrial, commercial, and manufactural areas. The spur lines are particularly concentrated in the heavy industrial districts, and in the section south of the Tennessee River such lines make connections with the marble quarries.

In addition to two freight stations, are four freight yards comprising an area capable of handling 7,000 freight cars. These relatively large areas used for

classification are quite in keeping with the railway pattern of any city, as enormous amounts of space are necessary for such work. However, the percentage of the land area devoted to this use, is small in Knoxville when compared with cities that are redistributing centers.

The use made of railways in Knoxville is quite high, evidenced by fourteen through passenger trains and six local trains entering the terminals each day. Approximately fifty freight trains enter and leave the city daily, making direct connections with the entire country. Railway lines radiate in all directions. Two lines extend to Cincinnati; one to Nashville; one to Atlanta and on to Florida; one to Chattanooga, making connections to Memphis and Birmingham; one to New York via Bristol and Washington; one to Asheville, making connections to Spartanburg, South Carolina, Winston-Salem, and Goldsborough, North Carolina; one short line to Harriman; another short line to Maryville; and, two freight lines connecting the coal fields at Jellico, Tennessee, and Middlesboro, Kentucky.

The location of the lands used for railway purposes in the city has had a profound influence on land utilized for other purposes. The almost complete encirclement of the central portion of the city, has brought about serious

problems in street planning. The city's commercial area has been limited, and spaces in close connection to the railway yards have been diverted to uses other than commercial enterprises due to the smoke.

V. Land Utilized for Industrial Purposes.

Factors entering into the localization of manufacturing plants include (1) large parcels of unoccupied land available at relatively low cost not only for factory sites but also for receiving grounds and storage yards, (2) an abundance of fresh water suitable for steaming and milling purposes, (3) zoning regulations established by the City Planning Commission which make it possible to perfect economies in the layout and operation of the plants, (4) adequate highway and railway transportation facilities for assembling raw materials and for distributing finished products, and (5) the proximity of residential communities which may be used for housing factory workers at a nominal cost.²

The land within the city utilized for industrial purposes consists mainly of those portions of the city around the railway lines. For convenience, the numerous

2. Johnson, R. W., Land Utilization in Memphis, Private Edition, (Chicago: University of Chicago Libraries, 1936), pp. 22-23.

industries have been divided into nine classifications, namely: (1) all marble industries including milling, processing, and monumental works; (2) all establishments associated with the textile and clothing industry; (3) those firms dealing in lime, cement, sand, gravel, brick, and contractor's supplies; (4) furniture and woodworking establishments; (5) lumber and lumber milling plants; (6) the metal-working industries; (7) chemical works; (8) food specialty manufacturers; and, (9) miscellaneous establishments that cannot be included within the other groups. (See groupings at end of section).

In dealing with the various classifications, borderline industries are bound to be in evidence. However, broad divisions were resorted to in order to avoid confusion. On the accompanying map are plotted the industries within the city, and where establishments are listed in this work followed by a number, such notations refer to corresponding reference on the map.

A. Marble.

The land used for marble industries engaged in milling and processing are all located along streams, excepting the Candora Marble Company (23) which is located south of the Tennessee River between the lines of the Louisville and Nashville and the Southern Railway. The

REPRESENTATIVE INDUSTRIES OF KNOXVILLE AREA

87 A

MARBLE



EAST TENNESSEE PLANT, MAKING
HIGH GRADE LIME FROM MARBLE WASTE



ROUGH MARBLE READY FOR SHIPMENT EAST TENNESSEE-
ON THE BANKS OF THE TENNESSEE RIVER.



INTERIOR OF MARBLE LIME PLANT
EAST TENNESSEE



LOADING MARBLE ON THE BANK OF THE
TENNESSEE RIVER



TOO LARGE FOR THE RAILROAD - TWO BLOCKS OF
TENNESSEE MARBLE THAT HAD TO BE CUT FOR SHIPMENT



CUTTING A SPECIAL SLAB
EAST TENNESSEE



TYPICAL MARBLE QUARRY IN EAST TENNESSEE



QUARRYING TENNESSEE MARBLE
FOR J.P.MORGAN & CO. BANK BLDG. N.Y.

COTTON



SPINNING ROOM KNOXVILLE COTTON MILLS
KNOXVILLE TENNESSEE



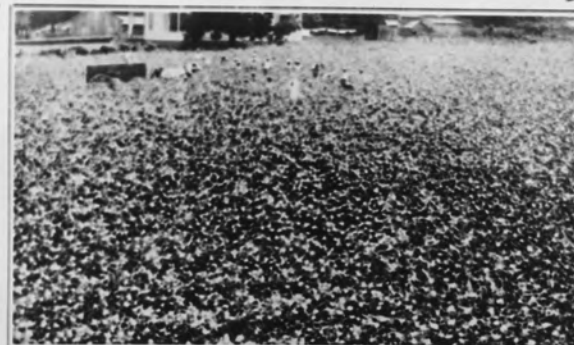
SPINNING ROOM CHEROKEE SPINNING CO.
KNOXVILLE, TENN.



COTTON LOOMS BROOKSIDE MILLS
KNOXVILLE, TENN.



MILL BUILDINGS - KNOXVILLE COTTON MILLS
KNOXVILLE - TENNESSEE



A SOUTHERN COTTON FIELD
LOWER TENNESSEE VALLEY



MILL BUILDINGS - BROOKSIDE MILLS
- KNOXVILLE - TENN.



KNITTING "KNOX-KNIT" HOSEYRY
KNOXVILLE KNITTING MILLS CO. KNOXVILLE, TENN.



A COTTON MILL TOWER
KNOXVILLE TENN.



WEAVING COTTON CLOTH BROOKSIDE MILLS
KNOXVILLE - TENN.

Tennessee Marble Company, Inc. (125) is located on the south and north side of the Tennessee River, the Ross Republic Marble Company, on the south side of the river on the Island Home Pike outside the city limits, while the three other companies are all located along Third Creek. The importance of streams in the location of such mills is due to the fact that considerable quantities of water are needed in the milling and finishing processes. Also of prime importance in addition to water, is easy access to rail facilities which are available in these areas. The location of monumental works are not determined by these factors, as the material handled is finished having a high unit value. Marketing advantages must be taken care of, and as a result the monumental works are often placed near cemeteries, as is the case of the Harding Monument Company, (52).

B. Clothing and Textiles.

The areas within the city utilized for textile and clothing manufacture take up a considerably larger portion of the area than that occupied by the various marble industries. The plants are scattered throughout the city, although location is determined to a large degree by the presence of an adequate supply of

water of relatively pure quality. The mills are located mainly along First Creek and Second Creek, with the exception of the Appalachian Mills Company (8) which is in close proximity to Third Creek, and the Jefferson Woolen Mills Company (58) which is on the south side of the Tennessee River.

The location of textile industries is largely determined by the presence of marble plants, which is brought out by the fact that textile plants are not located on the streams where marble plants are in operation. The refuse from the marble industry, marble dust and acid, which is deposited in the streams is highly injurious to the fibers, and where plants are located close together the textile factory obtains its water from wells, or else the marble refuse is disposed of by means of conduits below the intake for the textile establishment.

The presence of railways is also a determining factor in the location, as textiles represent articles of low unit value in comparison to size. Although the number of establishments are few in number, the total output is great, and there is room for expansion which in all probability will extend the area along First and Second Creeks.

C. Lime, Cement, Sand, Gravel, Brick, Contractor's Supplies.

Those industries within the city dealing in lime, cement, sand, gravel, brick, and contractor's supplies consist of seventeen different companies. Some of the concerns are mainly distributing houses for such products, while others are actively engaged in sand and gravel production, brick manufacture, cement manufacture, manufacture of concrete pipes and blocks, cinder blocks, rock crushing, and lime manufacture.

The only cement manufacturing plant in the immediate vicinity of Knoxville, is the Volunteer Portland Cement Company (133). The company is located just outside the eastern city limits on the north side of the Southern Railway line running to Bristol. The location of such a plant is determined by such factors, as source of raw material, fuel for burning mixture, cheap transportation facilities, and a near-by market. The necessary ingredients for Portland cement consists of lime, silica, alumina, and some iron oxide, all of which can be supplied from local sources. Fuel is easily obtained from the fields of Tennessee, Virginia, and Kentucky, and transportation rates although not actually cheap are such that the finished

product can stand the charges due to the short distances hauled. The city itself offers a considerable market, and with an area in which no large markets are available a considerable scattered market is offered, which cannot be taken over by outside concerns as marketing and distribution costs would be too high.

The land within the city utilized for lime manufacture consists of those parcels occupied by six plants engaged in its production. Three of the plants are located north of the Tennessee River, and three of them on the south side. The Oliver King Sand and Lime Company (60) is the only establishment any distance from the river, and is located in the eastern part of the city, just south of the line of the Southern Railway which leads to Bristol. The existence of lime plants in this area, is due to the presence of extensive deposits of marble which can readily be converted into calcined lime. In cases where the lime is marketed for agricultural uses, the Knox dolomite affords another source. The presence of magnesium, a constituent of dolomite, makes this supply unsuitable for constructional purposes as magnesium causes it to "slake" more slowly when mixed with water.

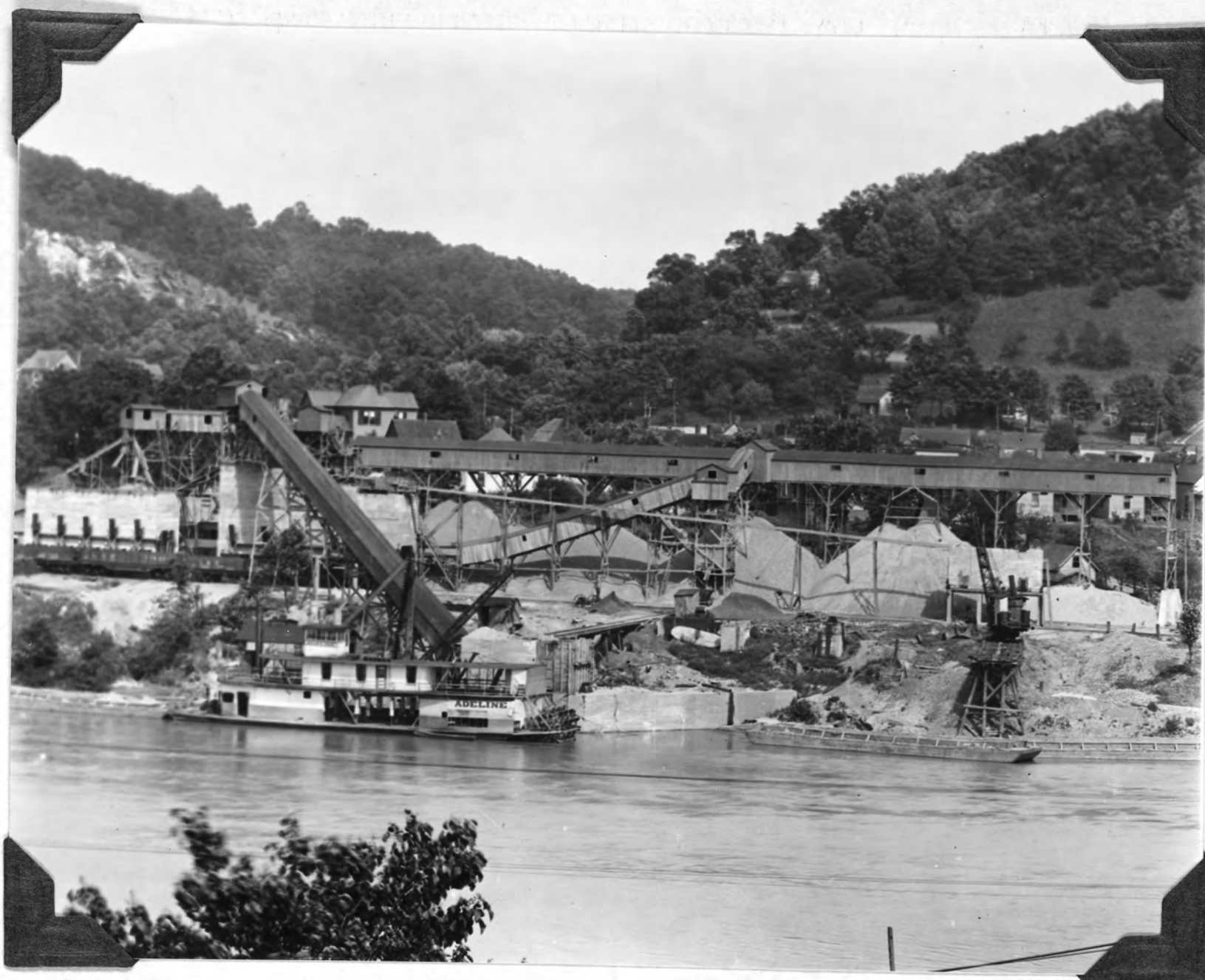
The only plants specializing in the manufacture of

bricks are the Cherokee Shale Brick Company (28) located in the northeastern part of the city, and the General Shale Products Company (46) which is located on a spur line of the Southern Railway southeast of the central commercial area on the north side of the Tennessee River. These plants utilize the local supply of argillaceous shale and can meet outside competition only as a result of location.

The two plants engaged in the manufacture of concrete blocks and concrete pipes are located in two widely separated sections of the city. The Shearman Concrete Pipe Company (109) is situated on the line of the Southern Railway in the extreme northeastern portion of the city, while the Southern Cast Stone Company (113) is located in the western part of the city on a line of the Southern Railway which runs to Chattanooga. The importance and location of such plants can be associated with the facts that a cheap source of raw material plus a local demand have made the establishment of such plants a natural one.

Those establishments engaged in sand and gravel production are all located in close proximity to the Tennessee River. The areas occupied by such plants are of considerable extent, and the major factor accounting for the location is a suitable supply of such material. The

92 A



SAND AND GRAVEL CO. ALONG TENNESSEE RIVER



VESTAL LUMBER COMPANY

output from these mills is of great local importance, but production is small when compared with western Tennessee. The sand and gravel obtained is not suitable for some purposes, and considerable quantities are shipped into Knoxville and the surrounding area.

The location of the Dempster Brothers' Company (37), dealers in contractor's supplies, east of the Southern Railway Shops (118), commonly referred to as the Coster Railway Shops, is a result of situation and market. The land necessary for such an establishment is quite large, and the bulkiness of the material and products handled necessitates the presence of suitable transportation facilities. The cheapness of the land in this section, plus the closeness of the main lines and spur tracks of the railways to all the major customers in Knoxville, made the selection of this site almost inevitable.

D. Lumber and Lumber Milling.

Within the city of Knoxville are thirteen plants engaged in lumber milling and the production of lumber. The importance of this industry on the city's development cannot be overestimated, as lumbering has always been of great importance in this section. The location of the various companies does not follow any set

pattern, as they are fairly widely distributed throughout the city, with heaviest concentration near the Standard Knitting Mills Company (119). The absence of lumber mills in the region near-by Third Creek, and the few mills south of the Tennessee River may be attributed to the fact that these areas were developed late in the city's history.

The location of lumber mills is determined by transportation facilities, and every plant is located along one of the lines of the railways serving Knoxville. In the early days, railways were not developed in the western parts of the city, and hence, the establishments were limited to the areas being served by the railways then in existence. Formerly, local supplies from the Unaka Mountains, the Great Valley, and the Cumberland Plateau areas could meet demands, but with the depletion of the supply more and more foreign lumber is being processed.

E. Furniture and Woodworking.

Closely associated with lumber and lumber milling, furniture and woodworking comprises one of the major groups of industries within the city. The variety of products produced include furniture, caskets, wood veneer, boxes, trunks, barrel heads, brooms, mops, cabinets, tables, etc. The lands utilized for such purposes take

up considerable areas in some instances, as in addition to the plants themselves, space must be provided for storage and seasoning of the lumber.

The location of the manufacturing establishments is not subject to a set pattern, but to a limited degree is associated with the lumber and lumber milling concerns. Those concerns producing products of considerable bulk such as caskets, boxes, barrel heads, trunks, and veneer are all located along railways as transportation costs largely determine final cost. The greatest localization of such plants is in the region to the northeast of the central commercial area along the line of the Southern Railway to Bristol. The companies in this vicinity are producers of products of relatively high value, when compared with veneered wood. As a result, the Foreign and Domestic Veneer Company (42) is located in the northwestern part of the city in the Lonsdale district, where advantage can be taken of cheap land as well as transportation.

The distribution of the highly specialized wood-working plants, is not so largely determined by land value and transportation costs as labor makes up the greater part of the finished product. The location of such industries is largely determined by the advantage of an

early start, as evidenced by the location of such plants in areas where industrial sites are relatively high in price. The plants show a definite breaking-away from the railway lines, in the case of the American Cabinet Company (150), although there is a general tendency of the manufacturing concerns to roughly parallel the railway lines coinciding with the manufacturing areas.

F. Metal-Working Industries.

The location of the metal-working industries in the city has largely been the result of a near-by market. The majority of the industries coming under this classification are largely processing mills, although there is one rolling mill, the Knoxville Iron Company (71). The plants are distributed quite widely throughout the city, yet there is a marked concentration of similar industries in localized centers.

Determining factors in the location of all of the heavy metal-working plants is the presence of rail facilities, and relatively large areas of cheap industrial property. The larger plants are all located on the outer edge of the industrial areas. The Knoxville Structural Steel Company (79), is located east of the Southern Railway Shops; the Knoxville Iron Company, between the north end of Western Avenue and the Southern Shops;

the Myers-Whaley Company (86), the Electro-Manganese Corporation (141), the O. A. Gaughron and Son Machine Shop (145), the West Knoxville Foundry (136), the Knox Stove Works (63), and the Fulton Sylphon Company (43) are all located along the lines of the Louisville and Nashville Railway in the western part of the city. Along the Southern Railway line, to Chattanooga, between the Cherokee Spinning Company (29) and the central commercial area are located the Nelson Iron Works (89), the Sanford-Day Iron Works (100), and the Knoxville Refrigerator Manufacturing Company (75); the only other companies that might be included in the grouping of such industries is the Knoxville Boiler Works (117), located across the Southern line from the Goodall Company (48), and the Blount Street Foundry (14) which is on the south side of the river.

All of the other concerns, listed under the Metal-Working Industries, are located in the central portion of the town.

G. Chemicals.

The location of chemical plants within the city is largely determined by the type of product produced. Those plants manufacturing such products as fertilizer and tannic acid are relegated to the outer portion of the city, where their presence is least

obnoxious. The other establishments engaged in the production of flavoring extracts, blueing, and miscellaneous chemicals are therefore located in the industrial sections that are close to the central commercial area, as most of these establishments require only small land parcels.

H. Foods.

The food products plants are, for the most part, distributed quite widely throughout the central portions of the city - outside of the industrial areas. The distribution of the plants does not follow any plan, as local market and convenience determines such location. The areas utilized are quite small, excepting for flour and feed mills, and the meat packing plants. Continuous daily sales of considerable volume are essential for the operation of such industries, and as the greater part of the ingredients are subject to rapid deterioration, storage space can be held to a minimum.

The products emanating from these plants consist of bread, cake, meats, coffee, preserves, flour, meal, feed, ice cream, mayonnaise and dressings, milk, butter, and beverages of various kinds. Due to the perishable nature of all the products enumerated, the market is definitely limited to local sales. Even those that could stand



Interior View - EAST TENNESSEE PACKING COMPANY

shipment for a short period, such as preserves and vinegar, are limited to the local area - as transportation costs prohibit shipment on goods that have such a low-unit margin of profit.

I. Miscellaneous Industries.

The industries within the city classified as miscellaneous enterprises include all the industries not grouped under any of the previous headings. The variety of products from such plants consist of ice, gas, mattresses, springs, paper boxes, leather belting, asphalt for streets, electrical porcelain, gloves, bakelite molding, tents, awnings, and buttons.

The land utilized for such purposes varies widely both in areal distribution and size of lots. The location is largely determined by the type of product produced, and market. In general, the larger portion of the industries is located in the south-central part of the city north of the river, with a few plants dotting the outer railway lines.

KEY TO MAP ON MANUFACTURING ESTABLISHMENTS
CLASSIFICATION BY GROUPS OF KNOXVILLE INDUSTRIES

MARBLE INDUSTRIES

1. Acuff Marble Co., monuments.
7. Appalachian Marble Co., finished marble.
23. Candora Marble Co., finished marble.
34. Day Marble and Granite Co., monuments.
49. Gray Knox Marble Co., finished marble.
52. Harding Monument Co., marble and granite monuments.
73. Knoxville Memorial Co., marble and granite monuments.
91. Padgett Marble Co., Monumental marble.
99. J. M. Ruggles and Son, monuments.
125. Tennessee Marble, Inc., finished marble,
Ross Republic Marble Co., Island Home Pike, (outside
city limits).

CLOTHING AND TEXTILES

3. American Clothing Co., men's clothing.
8. Appalachian Mills Co., underwear and sweaters.
10. Ashe Hosiery Mills, men's hosiery.
15. Bowman Hat Co., hat manufactures.
19. Brookside Mills, cotton voiles.
29. Cherokee Spinning Co., fine shirting manufacture.
48. Goodall Co., Palm Beach suits.
55. Holston Manufacturing Co., men's and children's hose.
58. Jefferson Woollen Mills, cloth manufacture
84. S. Liebovitz and Sons, shirt manufacture.
119. Standard Knitting Mills, knit underwear.

LIME, CEMENT, SAND GRAVEL, BRICK, CONTRACTOR'S SUPPLIES

17. F. H. Boyd, lime.
27. Cherokee Sand and Gravel Co., sand and gravel production.
28. Cherokee Shale Brick Co., brick manufacture.
33. Curtin Lime Co., lime.
36. Day Pulverizer Co., rock crushing.
37. Dempster Brothers Co., contractor's equipment.
46. General Shale Products Co. brick manufacture.
60. Oliver King Sand and Lime Co., sand and lime.

- 65. Knoxville Crushed Stone Co., stone.
- 72. Knoxville Lime Manufacturing Co., lime manufacture.
- 76. Knoxville Sand and Lime Co., sand and lime.
- 77. Knoxville Sangravel Material Co., construction materials.
- 109. Shearman Concrete Pipe Co., concrete pipes.
- 113. Southern Cast Stone Co., concrete blocks.
- 133. Volunteer Portland Cement Co., cement manufacture.
- 138. Williams Lime Manufacturing Co., lime.
- 139. O. B. Wise Pulverizing Co., rock crushing.

FURNITURE AND WOODWORKING

- 12. G. B. Atkin Co., furniture manufacture.
- 16. Appalachian Casket Co., casket manufacture.
- 26. Cherokee Mop Works, mop manufacture.
- 42. Foreign and Domestic Veneer Co., wood veneering.
- 51. Knoxville Casket Co., casket manufacture.
- 54. Holston Box and Lumber Co., box manufacture and lumber.
- 78. Knoxville Show Case Manufacturing Co., show cases.
- 80. Knoxville Trunk Co., trunk manufacture.
- 82. Knoxville Heading Co., barrel heads.
- 98. Royal Manufacturing Co., upholstered furniture.
- 114. Southern Coffin and Casket Co., caskets and vaults.
- 127. Tennessee Table Co., table manufacture.
- 128. Tennessee Valley Broom and Mop Co., brooms and mops.
- 129. Old Hickory Manufacturing Co., wood cabinets.
- 137. Whittaker Broom Works, brooms.
- 151. American Cabinet Co., wood cabinets.

LUMBER MILLING AND LUMBER

- 18. Broadway Manufacturing Co., dressed lumber.
- 24. Chavannes Lumber Co., finished lumber.
- 30. City Lumber Co., dressed lumber.
- 31. Cockrum Lumber Co., lumber and millwork.
- 41. Farragut Lumber Co., lumber and millwork.
- 94. Quality Lumber Co., lumber products.
- 97. D. M. Rose and Co., lumber.
- 104. Schubert Lumber Co., lumber and millwork.
- 110. Shepard Lumber Co., lumber and millwork.
- 123. Tennessee Flooring Co., wood flooring.
- 124. Miller Bros. Co., lumber.
- 132. Vestal Lumber and Manufacturing Co., lumber.
- 140. Witt Lumber Co., lumber.

METAL WORKING INDUSTRIES

- 9. D. G. Arwood Co., furnaces and sheet metal products.
- 11. Atchley and White Machine Shop.
- 14. Blount Street Foundry.
- 38. Dempster Machine Shop.
- 43. Fulton Sylphon Co., temperature controls.
- 47. Arwood Can Manufacturing Co., tin cans and sheet metal.
- 59. Keller Foundry Co.
- 63. Knox Stove Works, stove manufacture.
- 67. Knoxville Foundry and Machine Shop.
- 71. Knoxville Iron Co., rolling mill.
- 75. Knoxville Refrigerator Manufacturing Co.,
commercial refrigerators.
- 79. Knoxville Structural Steel Co., steel.
- 86. Myers-Whaley Co., mine machinery.
- 89. Nelson Iron Works, iron grills and fencing.
- 100. Sanford-Day Iron Works, mine cars, machinery.
- 102. W. J. Savage Co., machinery.
- 103. Schaad Manufacturing Co., machine shop.
- 106. Service Brass and Metal Co., foundry.
- 117. Knoxville Boiler Works, foundry.
- 130. Ty-Sa-Man Machinery Co., mill machinery.
- 136. West Knoxville Foundry, iron castings.
- 141. Electro-Manganese Corp., manganese reduction.
- 145. O. A. Caughron and Son, machine shop.

CHEMICALS

- 32. C. M. Cowan Co., blueing manufacture.
- 35. Davis Manufacturing Co., flavoring extracts.
- 50. Greever-Lotspeich Co., flavoring extracts.
- 56. Industrial Colloids and Chemical Co.,
manufacturer's chemicals.
- 61. Kinney Chemical Products Co., chemicals.
- 66. Knoxville Fertilizer Co., fertilizer manufacture.
- 111. Siegal's Sanitary Supplies, disinfectants.
- 116. Southern Extract Co., tannic acid and paper board.
- 142. Armour Fertilizer Works, fertilizer manufacture.
- 143. Federal Chemical Co., fertilizer.

FOODS

2. American Bakeries Co., bread and cakes.
20. Brown Greer and Co., operating Kern's Bakery.
25. Royal Crown Bottling Co., soft drink bottlers.
39. East Tennessee Packing Co., meats.
44. Gale Products Co., ice cream.
45. Knoxville Abattoir Co.
53. Hartman Beverage Co., bottlers of soft drinks.
57. J. F. G. Coffee Co., coffee roasting and salads.
81. T. L. Lay Packing Co., meats.
83. M. Licht and Co., vinegar and preserves.
92. Dr. Pepper Bottling Co., soft drink bottlers.
93. Peters and Bradley Mill, flour and meal.
96. Reddy Manufacturing Co., Coca-Cola bottlers.
101. Sani-Seal Co., ice cream.
105. Security Mills, Inc., feed.
106. Seven-Up Bottling Co., soft drinks.
107. Seven Springs Bottling & Water Co., bottling plant.
112. J. Allen Smith & Co., flour and meal.
115. Southern Dairies, Inc., ice cream and milk products.
120. Kay's, ice cream.
121. Swift Ice Cream Co., ice cream.
122. Swan Bros., bakery.
134. Walla Walla Gum Co., chewing gum manufacture.
135. Ray-Field Candy Co., candy manufacture.
144. Supreme Foods Co., mayonnaise and dressings.
149. Sugar Creek Creamery, butter.

MISCELLANEOUS

4. American Service Co., ice manufacture.
5. Anchor Spring and Bedding Co., mattresses and springs.
6. O. B. Andrews Co., paper boxes.
13. Atlantic Ice Co., ice manufacture.
21. B. T. Ice Co., ice manufacture.
22. Browning Belting Co., leather belting.
40. Emulsified Asphalt Products Co., asphalt for streets.
62. Knox Porcelain Co., electrical porcelains.
64. Knoxville Belting and Supply Co., beltings.
68. Knoxville Gas Co., gas manufacture.
69. Knoxville Glove Co., glove manufacture.
70. Knoxville Ice and Cold Storage Co., ice manufacture.
74. Knoxville Paper Box Co., paper boxes.

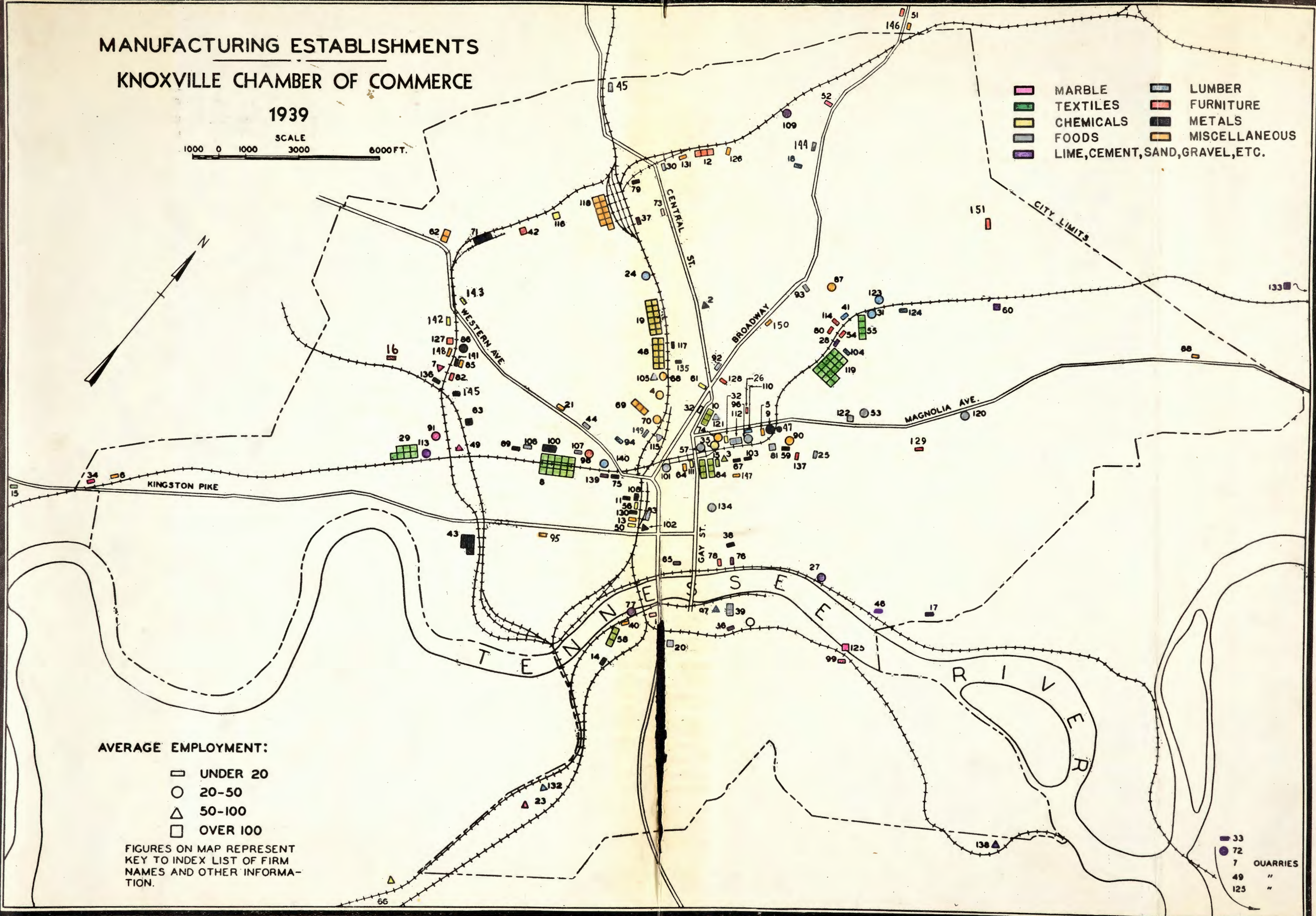
- 85. Marshall Spring and Bedding Co., mattresses and springs.
- 87. Morgan Ice and Coal Co., ice manufacture.
- 88. National Plasties Co., Bakelite molding.
- 90. North Star Ice and Fuel Co., ice manufacture.
- 95. Knoxville Awning, Tent and Tarpaulin Co., awnings, etc.
- 118. Southern Railway Co., shops.
- 126. Tennessee Mattress Co., mattresses and springs.
- 131. Van Gilder Glass Co., glass beveling.
- 146. Brothers Bedding Co., mattresses.
- 147. American Tent and Awning Co., tents and awnings.
- 148. Patent Button Co., button manufacture.
- 150. Tennessee Valley Awning Co., awnings.

MANUFACTURING ESTABLISHMENTS KNOXVILLE CHAMBER OF COMMERCE

1939

SCALE
1000 0 1000 3000 6000 FT.

	MARBLE		LUMBER
	TEXTILES		FURNITURE
	CHEMICALS		METALS
	FOODS		MISCELLANEOUS
	LIME, CEMENT, SAND, GRAVEL, ETC.		



AVERAGE EMPLOYMENT:

- UNDER 20
- 20-50
- 50-100
- OVER 100

FIGURES ON MAP REPRESENT
KEY TO INDEX LIST OF FIRM
NAMES AND OTHER INFORMATION.

33
72
7 QUARRIES
49 "
125 "

CHAPTER VII

CONCLUSION AND GENERAL SUMMARY

The growth and development of Knoxville has been largely the result of geographic factors. The site and situation factors greatly affected the early development of the general area, and of late such items have been of even greater importance.

The population growth of the city has actually been a steady one, as evidenced by the normal curve presented when county population figures are considered. Great periodic jumps are not actualities as often advertised, and it is time that such misleading statements are stopped. With such discrepancies, unreal values are placed on land which leads to skepticism on the part of manufacturers to locate in the community, and statements issued as inducements act as deterrents.

The Tennessee River has played a dominant role in Knoxville's development, and although it has declined in importance it still has a definite effect on the city.

The location of the city in the Great Valley of East Tennessee made Knoxville a center for trade in this general area, which to date it has never relinquished. Not only did the Valley provide communication routes, but

it also provided a source of agricultural products, mineral products, and lumber upon which a stable economy was established.

The presence of the Unaka Mountains and the Cumberland Plateau have limited the eastern and western margins of Knoxville's hinterland. However, these areas have provided important raw materials for local industries. In addition, the Cumberland Gap has diverted trade towards Knoxville as it presents one of the most feasible routes through the Cumberland Front.

The climate of Knoxville is characterized by its comparative mildness, with relatively warm summers and cool winters. Such climatic conditions have had a profound influence on living conditions, and heating costs in this section are lower than in regions farther north. The relatively high humidity has also given the area an advantage in the spinning of cotton over regions farther south, as humidity or water vapor in the air, tends to keep the fibers from breaking in the spinning process.

The people who settled Knoxville have definitely affected the growth and development of the city. The influence of such a group of settlers is still felt by the continuation of their principles and ideals, as evidenced

by the strict adherence to laws preventing Sunday entertainment and the sale of alcoholic drinks at any time.

The city represents a town with four major functions, namely: (1) that of a distributing center; (2) that of a manufacturing center; (3) a governmental center for the Tennessee Valley Authority; and (4) an educational center.

The topography of the land occupied by the city has had a definite effect on the site, street, commercial, residential, railroad, and manufacturing patterns, and on the evolution of the growth of the city in general. The importance of the several southward flowing creeks has definitely limited east-west expansion, and the problems presented by such streams have determined, to a large degree, the railway routes and streets within the city, which in turn have influenced the patterns in regard to commercial, industrial, and residential areas.

The land utilized for residential purposes may be divided into four groups, although gradation between the highest and the lowest type may not be as gradual as might be expected. The factor lying behind this is that the lowland areas are less suitable for homes, and with the numerous creeks within the central part of the city, the most and least desirable homesites are in close proximity to one another.

The churches constitute the greatest number of public-use land parcels, followed by schools and parks. The so-called park system within the city is inadequate to meet present needs and demands, and there is a general attitude of unconcern on the part of those individuals who could make such a plan a reality. The necessity of a planned program is not an imaginary problem, as Knoxville represents one of the few cities in the United States that does not have any wooded park areas. The City Planning Commission in 1930 in its report formulated a comprehensive system of recreational facilities which could well be considered along with future city development.¹ The plan calls for thirty-three playgrounds now included within the present corporate limits; playfields for the more active sports such as tennis, baseball, football, soccer, and the like at all Junior and Senior High Schools, with municipal playfields in addition throughout the city; colored playfields, parks, and playgrounds, with ample provisions for equipment; a system of community centers to care for winter activities in our public schools; a system of parks and pleasure drives to include large

1. Bartholomew, Harland, and Associates, A Comprehensive City Plan for Knoxville, (Knoxville: Knoxville City Planning Commission, 1930), pp. 137-160.

outlying parks, intermediate large parks, neighborhood parks consisting of twenty-three districts, only a few of which are now served, formal boulevards, naturalistic parkways, and riverside drives. The cost of such a program would be extremely expensive, but by a program covering several years with additional improvement each year, it could be financed at a nominal cost. The returns from such expenditures would be intangible in most cases, but certainly the presence of park areas (not necessarily playgrounds) would add greatly to residential land valuation. The elimination of many unsightly and dirty areas within the city, would not only offer returns from a standpoint of beauty, but also from health. In addition, with a city planned landscape, individual sites could be correlated giving a setting that cannot be duplicated when so many times houses are enclosed by shrubbery and fences to shut off views that are not in line with the general architectural plans.

The residential pattern has shifted considerably along with the development of the city, as has the manufacturing industries. However, the commercial core of the city, has remained fairly constant, although at the present time there is a general scattering of

outlying commercial enterprises due to the large areas zoned for business.

Land usage does not necessarily conform with the proposed use of the land as set up by the City Planning Commission. The discrepancies between actual land use and land use as proposed by the Commission in 1930 is due to the fact that actual land utilization was in force long before the plan.

In years to come, the expansion of the city limits will be necessary, but large areas within the city are now undeveloped and their utilization should take place first. Expansion of area, in a region in which the terrain is so varied means great expenditures for the services performed by the city, and further expenditures cannot be met by taxes levied on the comparatively few that would be taken into the city.

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