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I am submitting herewith a dissertation written by Tyrel Gilce Moore, Jr. entitled "An Historical Geography of Economic Development in Appalachian Kentucky, 1800-1930." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Geography.

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AN HISTORICAL GEOGRAPHY OF ECONOMIC DEVELOPMENT IN
APPALACHIAN KENTUCKY, 1800-1930

A Dissertation

Presented for the

Doctor of Philosophy

Degree

The University of Tennessee, Knoxville

Tyrel Gilce Moore, Jr.

March 1984

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ABSTRACT

This study hypothesizes that Appalachian Kentucky's nineteenth century commercial economic development was as significant as coal mining in shaping economic patterns which appeared during the depression years of the 1930's. Testing of this hypothesis permits the evaluation of widely-held views of the region's development.

The economic landscape of the 1800's has generally been thought of as a rather homogeneous unit, isolated from outside commercial linkages, and almost wholly dominated by subsistence agriculture. This study concludes that the region's nineteenth century economy was:

1) spatially and structurally more complex than has previously been recognized, 2) not by-passed by national economic growth in 1850, as previous research indicates; and, 3) characterized by some commercial agriculture rather than the subsistence stereotype presented in other works. Agriculture characterized many areas, but industrial patterns were also based on iron, timber, and salt, as well as coal. Uneven development of these resources produced subregional economic patterns as early as 1850. As late as 1870, the region's charcoal iron, salt, coal, and livestock were marketed in central Kentucky, the lower Ohio River Valley and the Upland South. At this point in its development, eastern Kentucky was more like many rural areas than it would later be and was certainly economically less homogeneous than previous studies have suggested.

Two conclusions are drawn from the evaluation of conventional views of the area's twentieth century economic development: 1) the industrial transformation that coal brought to an agrarian economy was valid only

for certain areas at certain times, and, 2) economic patterns continued to develop unevenly, as they had in the 1800's. By 1920, mining was the chief economic enterprise in only ten of the region's thirty-one counties and was strongly concentrated in the southeastern part of the area. That development has erroneously been interpreted as representative of the entire region.

Appalachian Kentucky did not develop as a unified economic entity. Complexities of the region's development have been masked by generalization and by stereotypes formed on impressions from limited areas. A clearer understanding of Appalachian economic development may be achieved if conventional assessments of the region are interpreted with caution.

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CHAPTER I

INTRODUCTION

Background of the Study

Appalachia has been referred to as an American enigma -- a region rich in natural beauty and resources, inhabited by a ruggedly independent people, but steeped in economic and social depression.¹ Eastern Kentucky, with its valuable coal resources and poverty conditions, epitomizes the enigmatic character of Appalachia and has been identified as the region's most difficult problem area.²

Notions that set Appalachian Kentucky culturally and economically apart from the rest of the nation first emerged during the 1870's in the writings of authors such as James Lane Allen and John Fox, Jr., who drew upon the area's peculiarities and local color.³ Similar perceptions were later found in scholarly literature such as the American Journal of Sociology, which featured an article in 1898 that

¹Donald N. Rothblatt, Regional Planning: The Appalachian Experience, (Lexington: D. C. Heath and Company, 1971), p. 1.

²Niles M. Hansen, Rural Poverty and the Urban Crisis: A Strategy for Regional Development, (Bloomington: Indiana University Press, 1970), p. 89.

³Henry D. Shapiro, "Appalachia and the Idea of America: The Problem of the Persisting Frontier" in J. W. Williamson, (ed.), An Appalachian Symposium (Boone, N. C.: Appalachian State University Press, 1977), p. 44; Ronald D. Eller, Miners, Millhands, and Mountaineers: Industrialization of the Appalachian South, 1880-1930, (Knoxville: The University of Tennessee Press, 1982), pp. 77-78.

viewed eastern Kentucky as a "retarded frontier of America."⁴ This frontier image of slow economic development and romantic appeal identified the region as a distinct area that was culturally and economically separate from the rest of the United States. At the turn of the twentieth century, observers such as Ellen C. Semple and John C. Campbell emphasized the distinctive character of the region as they pointed out the self-reliant attitudes of the people.⁵ Interest in the region's economic status was secondary, and the effects of geographic isolation used as explanations for the region's unusual cultural development were also identified as major reasons for the area's slow economic growth.

Between 1900 and 1920, significant changes in outside views of the region took place, and by the 1930's Appalachia was seen as a national problem area. Severe and persistent socio-economic distress, rather than the frontier character of the area and its people, provided a focus for attention. Although nostalgic writings continued to appear, much of the literature on the area became oriented toward identification and measurement of the region's problems. Reports

⁴George E. Vincent, "A Retarded Frontier," The American Journal of Sociology, Vol. 4, No. 1 (July, 1898), pp. 1-20.

⁵Ellen Churchill Semple, "The Anglo-Saxons of the Kentucky Mountains: A Study in Anthropogeography," Geographical Journal, Vol. 17 (1901), pp. 588-623. Reprinted in the Bulletin of the American Geographical Society, Vol. 42 (1910), pp. 1-34; John C. Campbell, The Southern Highlander and His Homeland, (New York: The Russell Sage Foundation, 1921), p. 90.

published in 1935 by the U.S. Department of Agriculture and in 1936 by the Wharton School of Finance indicated that the region's economic problems stemmed from an imbalance between population and economic opportunity. It was suggested that the region's problems were closely linked with the "economic and social evils" of coal mining.⁶

These studies were significant in a number of respects. First, they identified the southern Appalachians as a special case among areas severely affected by the national depression. Second, economic and social problems of unemployment, population pressure, and the almost singular dependence on the coal industry, were established as factors to be dealt with in government programs aimed at relieving economic conditions. Finally, these investigations served as a guide to future treatment of the area. Subsequent publications by Ford in 1962, Bowman and Haynes in 1963, and the President's Appalachian Regional Commission in 1964, arrived at similar conclusions.⁷ Ultimately, the regional problems recognized in the

⁶U.S. Department of Agriculture, Miscellaneous Publication No. 205, Economic and Social Problems and Conditions of the Southern Appalachians, (Washington: U.S. Government Printing Office, 1935), pp. 3-6.; Frederick G. Tryon and Bushrod W. Allin, "The Southern Appalachian Coal Plateaus," in Carter Goodrich, et al, Migration and Economic Opportunity, (Philadelphia: University of Pennsylvania Press, 1936), pp. 61-62.

⁷Thomas R. Ford (ed.), The Southern Appalachian Region: A Survey, (Lexington: University of Kentucky Press, 1962); Mary Jean Bowman and Charles W. Haynes, Resources and People in East Kentucky: Problems and Potentials of a Lagging Region (Baltimore: The Johns Hopkins Press, 1963); The President's Appalachian Regional Commission, Appalachia, (Washington: U.S. Government Printing Office, 1964).

1930's provided much of the basis for policies and actions of the Appalachian Regional Commission which was established in 1965.⁸

Statement of Problem

The problems that have persisted since the 1930's have been documented and closely linked with the infrastructure established during the development of commercial coal mining. Only general and thinly documented attention has been given to the regional economic geography which existed before widespread mining began. Geographic isolation is considered to have created a closed regional economy as early as 1850, causing the area to be by-passed as the national economy expanded.⁹ For example, Davis stated that pioneer conditions existed throughout the region prior to 1900.¹⁰ Caudill, as well as White, Foscue, and McKnight credited the twentieth century coal industry with transforming an agrarian economy into an industrial economy.¹¹ More recently, Eller dated the beginning of the industrial

⁸ Rothblatt, op. cit., p. 5

⁹ Ibid.

¹⁰ Darrell H. Davis, Geography of the Mountains of Eastern Kentucky, Series 6, Vol. 18, Kentucky Geological Survey (Frankfort: Kentucky Geological Survey, 1924), p. 156.

¹¹ Harry M. Caudill, Night Comes to the Cumberlands, (Boston: Little, Brown and Co., 1963, pp. x-xii; C. L. White, E. J. Foscue, and T. L. McKnight, Regional Geography of Anglo-America, (Englewood Cliffs: Prentice-Hall Publishing Co., 1974), p. 207.

period in the southern Appalachians as 1880, considering earlier periods as pre-industrial and focusing on eastern Kentucky mainly after 1900.¹² Collectively, these views depict eastern Kentucky's commercial economic development as essentially a twentieth century phenomenon, created largely by mining. No detailed documentation of the region's early economic and historical geography exists to provide a background for alternative interpretations of eastern Kentucky's evolution as a depressed area.

It is hypothesized that the nineteenth century economic development was as significant as mining in shaping economic patterns of the 1930's. To test this hypothesis, data are examined to determine how geographical patterns of population, agriculture, manufacturing, and mining changed over the area between 1800 and 1930.

This study has two major objectives: 1) to present an historical geography of the region's economic development to 1930; and 2) to evaluate widely-held views that the region was by-passed by national economic expansion during the mid-nineteenth century and that coal mining was almost solely responsible for the region's subsequent economic patterns.

Geographic Significance of the Study

Eastern Kentucky's economy developed on the basis of local resources and investment as settlement spread and agriculture and

¹²Eller, op. cit., pp. 140-149.

localized manufacturing gained importance in the eastern United States. After the Civil War, the national economy expanded, shifting from agriculture to manufacturing with significant growth in transportation and manufacturing in the East and Midwest. As manufacturing developed in the Mid Atlantic and Midwestern states, economic development in eastern Kentucky, especially manufacturing and specialized commercial agriculture, was pre-empted by more rapid growth and locational advantages in areas to the north. In contrast, economic development in Appalachian Kentucky depended heavily on outside capital oriented to the procurement of coal and timber. Localization of these resources promoted the continuation of subregional economic patterns, causing inequities in the degree to which eastern Kentucky shared in national economic expansion.

Geographers have focused little attention on the area's changing economic geography during the period 1800 to 1930, taking instead, static views of the region.¹³ Broader accounts covering the southern United States provide only limited economic assessments, concentrating on eastern Kentucky's pioneer character and physical isolation.¹⁴

¹³ Examples are: Semple, op. cit.; Davis, op. cit.; and more recently, R. C. Langman, Appalachian Kentucky: An Exploited Region, (Toronto: McGraw-Hill Ryerson, Ltd., 1977).

¹⁴ Examples are: A. E. Parkins, The South: Its Economic Geographic Development (New York: John Wiley and Sons, Inc., 1938); Rupert E. Vance, Human Geography of the South: A Study in Regional Resources and Human Adequacy (New York: Russell and Russell, 1932); J. Russell Smith, North America (New York: Harcourt, Brace and Company, 1925).

Local histories have pursued certain aspects of the region's economic structure but are understandably fragmented in the larger context of the region and therefore lack a significant spatial perspective.

Effective documentation of economic growth at the regional scale would illuminate patterns of the area's past geography as well as contribute to the literature involving spatial variations within the historical geography of American economic expansion.

Study Area

The study area consists of thirty-one counties in eastern Kentucky (Figure I-1) and generally conforms to well-recognized delimitations made by Campbell, Davis, and the U.S. Department of Agriculture.¹⁵ This permits the area and topic to be approached at a meso-scale between studies oriented to individual counties or drainage basins and studies focused on the larger Southern Appalachian Region.¹⁶ The number of counties in the study area is

¹⁵Campbell, op. cit., frontispiece; U.S. Department of Agriculture, op. cit., pocket map; Davis, op. cit., p. 14.

¹⁶William Ely, The Big Sandy Valley (Catlettsburg, Kentucky, 1887); Mary Chapman, "The Influence of Coal in the Big Sandy Valley," Unpublished Ph.D. dissertation, University of Kentucky, 1945; and Ronald W. Yarbrough, "A Geographical Study of a Micro-Region in Appalachia - The Clover Fork Valley of Harlan County, Kentucky," Unpublished Ph.D. dissertation, University of Tennessee, Knoxville, June, 1972.

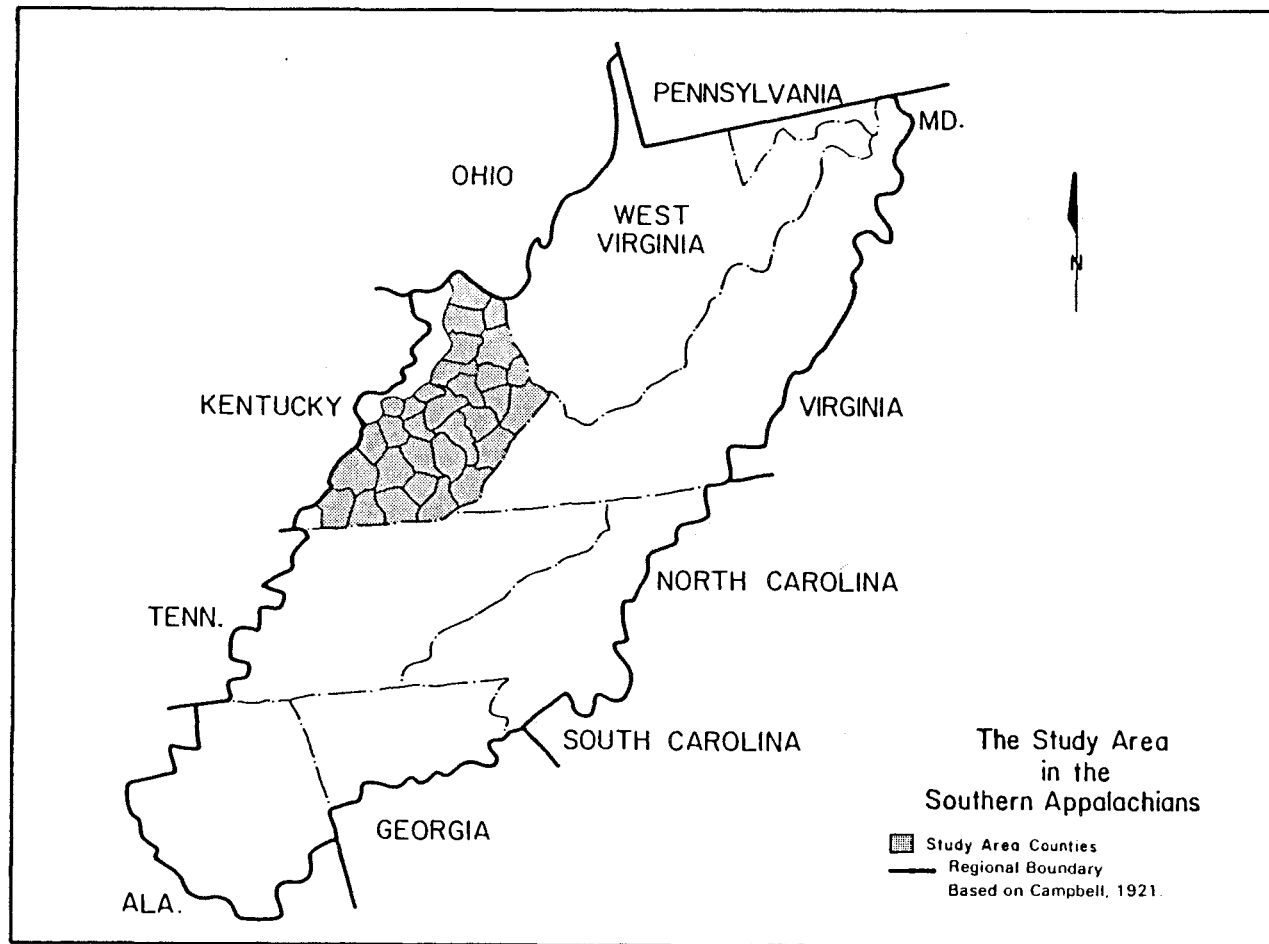


Figure I-1. The Study Area in the Southern Appalachians.

both adequate and manageable for meaningful mapping of economic patterns at county-level and subregional scales. This feature is especially desirable for presentation and analysis of economic change over time and permits the inclusion of detailed documentation which could not be as effectively presented at a smaller scale.

Methods and Procedures

Because the region's early development has received little attention and a variety of economic activities are examined, regional historical geography provides an appropriate methodological framework for several reasons. First, the method is commonly used in studies which have strong topical biases similar to the theme of economic development pursued here. It also provides a way of establishing a firm regional context while adding the historical perspective needed in regional studies. Finally, the approach emphasizes the distinctive perspective of historical experience which allows activities of a region to be understood in terms of their changing internal relationships.¹⁷

The study is divided into four periods: 1) economic development to 1870; 2) economic change from 1870 to 1890; 3) the impact of coal mining from 1890 to 1920; and, 4) expansion and collapse of

¹⁷ Andrew H. Clark, "Historical Geography in North America," in Alan R. H. Baker (ed.), Progress in Historical Geography, pp. 133-134, and 137-138; Leonard Guelke, Historical Understanding in Geography, An Idealist Approach. Cambridge Studies in Historical Geography, 3, (Cambridge: Cambridge University Press, 1982), pp. 101-102.

mining, from 1920 to 1930. These periods were chosen on the basis of breaks which appeared in graphed trends in outputs of agriculture, manufacturing, and mining. Establishment of these divisions was also based on maps showing transportation developments. Treatment of each of the four periods includes discussions and mapped patterns of the region's population, agriculture, manufacturing, and mining. Economic activities are evaluated in terms of their input to the regional economy in summaries of each period. Comparisons of mapped patterns and the status of the region are used to demonstrate geographical change over the period studied.

Data Sources

Sources Used for the Period to the 1870's. Manuscript censuses of agriculture and manufactures for the years 1840-1880 comprise the greatest source of detail for the period to the 1870's. Manufacturing returns include employment in industries from wool carding factories and sawmills to iron furnaces. The value and output of manufactured or milled articles, as well as the quantity and kind of raw material inputs are also documented. In the returns for 1850 sources of raw materials are included, so that regional or local linkages among industries can be documented. Other primary material comes from published reports of the Kentucky Geological Survey which began with the Mather reports of 1836, and provide the earliest documentation of the area's coal trade.¹⁸ These reports

¹⁸ William Williams Mather, The First and Second Geological Surveys of Kentucky 1836-1838 (Frankfort: State Journal Publishing Co., 1839).

are as geographical as they are geological and show the character of the area in its early development.¹⁹

The most useful secondary works on the period were written by Mary Verhoeff.²⁰ Her economic histories served as a model for subsequent, less thoroughly documented studies but rarely included maps to provide a needed spatial perspective.

Early maps include those by Barker (1795), Fenner and Sears (1830), Bradford (1835 and 1838), Coperthwait (1850), Middleton and Strawbridge (1861), and Shaler (1875). These show transportation routes, towns, mines, salt works, and iron works. The earliest topographic surveys by the U.S. Geological Survey were made in the early 1880's, and are somewhat helpful in the interpretation of census data.

Sources Used for the Period 1870-1890. After 1878, biennial reports were compiled by the Kentucky Department of Agriculture. These provide fairly consistent accounts of transportation, resources, and agriculture at the county level. They also contain descriptions of economic activities in towns and trading centers that, together with census returns and other sources were useful in mapping and interpreting the regional economy.

¹⁹For a complete bibliography, see Arthur C. McFarland, Geology of Kentucky (Lexington: University of Kentucky Press, 1943).

²⁰Mary Verhoeff, The Kentucky Mountains, Filson Club Publication No. 26, (Louisville: John P. Morton and Co., 1911); The Kentucky River Navigation, Filson Club Publication No. 28, (Louisville: John P. Morton and Co., 1917).

By 1884, coal mining came under annual inspection and safety regulation by state agencies. This series of reports is extremely valuable because it gives the location, number of employees, production, and marketing data for each mine that had five or more employees.²¹ Some issues include reasonably good maps, but railroad maps published by the state commissioner of railroads and Poor's Manual of Railroads are constructed at more useful scales. These sources used to document and map the expansion of mining activities and direct attention to parts of the area where changes occurred with the introduction of railways.

Sources Used for the Period 1890-1920. Changes which took place when mining was established in new areas are often reflected in trade journal articles. Periodicals such as The Appalachian Trade Journal and Coal Age functioned as industry newspapers and closely monitored development in the eastern Kentucky Coal Field. Similar information appears in mining engineering journals and in reports of the U. S. Geological Survey.²² The Kentucky Geological Survey was also active during the late 1890's and early 1900's. Its surveys of coal

²¹Kentucky Department of Mines and Minerals, Annual Reports, 1884-1940. (Place of publication and publisher varies).

²²Charles W. Hayes, "The Southern Appalachian Coal Fields," 22nd Annual Report of the U.S.G.S. 1900-01 (Washington: U.S. Government Printing Office, 1902).

analyses were oriented to drainage basins over the area, and included geographical sketches and small area maps just prior to changes which accompanied large-scale mining. Quantitative data presented in the state agricultural reports became more detailed during this period, and the relationship between timbering and mining activities is well-documented.

Sources Used for the Period 1920-1930. The development of the coal industry is chiefly presented from production and employment data tabulated in the state inspection reports and the U.S. Geological Survey's Mineral Industries of the United States.²³

Two recent secondary works, Eller's Miners, Millhands and Mountaineers and Shackelford and Weinberg's Our Appalachia, a published version of the Appalachian Oral History Project, are useful supplements to data from the census and state agencies.²⁴

Morris and Ross produced vivid accounts of the social and economic strife which resulted from unemployment in the coal industry.²⁵ The 1935 U. S. Department of Agriculture report and the survey submitted by Goodrich are also especially valuable documentaries

²³U.S. Geological Survey, Mineral Industries/Resources of the United States, 1883-1931 (Washington: U.S. Government Printing Office, 1884-1931).

²⁴Eller, op. cit.; Laurel Shackelford and Bill Weinberg, Our Appalachia (New York: Hill and Wang, 1977).

²⁵Homer Morris, The Plight of the Bituminous Coal Miner (Philadelphia: University of Pennsylvania Press, 1934); Malcolm Ross, Machine Age in the Hills (New York: The Macmillan Co., 1933).

of the regional economy of the 1930's.²⁶ The state agricultural reports diminished in utility after 1919, when they became more of a review of the census, but Davis' monograph and publications from the Federal Writer's Project provide unusual detail during the 1920's and 1930's.²⁷ Census returns also became more sophisticated in the later periods and are relied upon extensively in the final chapter of the text.

Either as a continuous data base or as accounts of the region during certain time periods, information from these sources facilitate comparison and identification of change in eastern Kentucky's economic development and historical geography. As such, they provide a basis for analysis and interpretation of the forces and events which shaped the economic landscape of the nineteenth and twentieth centuries.

²⁶U. S. Department of Agriculture, op. cit., and Goodrich, op. cit.

²⁷Davis, op. cit.; Federal Writer's Project, Kentucky: A Guide to the Bluegrass State (New York: Harcourt, Brace and Company, 1939).

CHAPTER II

PATTERNS OF ECONOMIC DEVELOPMENT TO 1870

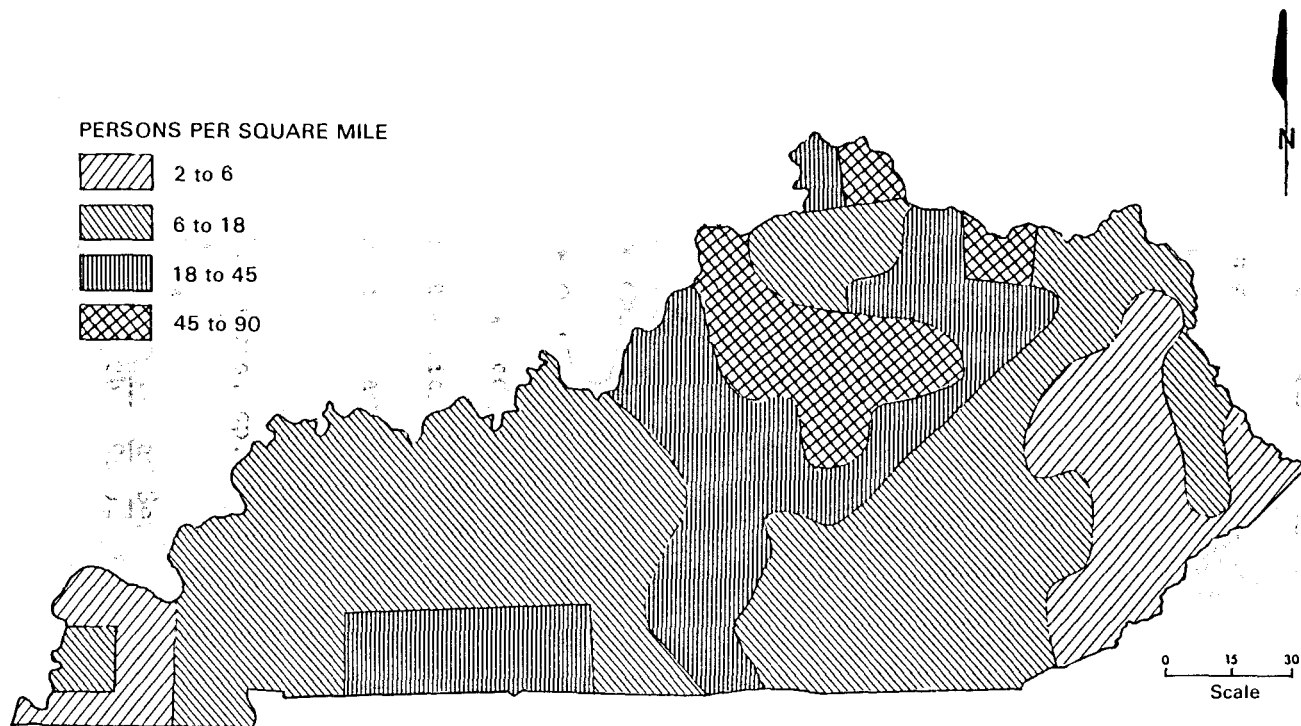
Permanent settlement of eastern Kentucky began around the late 1780's. Migration routes into the region followed the Ohio River and Big Sandy River in the north and east. Entry from the southeast was gained via the Cumberland Gap and Pound Gap although other less well-known divides facilitated movement into the mountains as well.¹ Migration came largely from Virginia, North Carolina, and Tennessee as individuals or small groups obtained enough land to begin supporting their families.² Preferred agricultural lands were confined to creek bottoms which laced the dissected Cumberland Plateau and created dispersed settlement patterns. By 1830, eastern Kentucky's population density remained lower than that of central Kentucky and the Ohio River Valley where economic development and subsequent urbanization occurred more rapidly (Figure II-1). Slower development in the eastern part of the state has been attributed to rugged topography which induced isolation amid the western expansion of settlement.³ Scholarly acceptance of the strong role played by isolation ultimately suggested that little

¹Virginia Clay McClure, "The Settlement of the Kentucky Appalachian Highlands," unpublished Ph. D. dissertation, University of Kentucky, 1933, pp. 141-142.

²Campbell, op. cit., pp. 28-40.

³Rothblatt, op. cit., pp. 5-6; Bowman and Haynes, op. cit., p. 49.

DENSITY OF POPULATION, 1830



Source: Statistical Atlas of the United States, 1870.

Figure II-1. Density of Population, 1830.

or no economic development occurred prior to transportation improvements which accompanied commercial coal mining around 1900.⁴ The region's nineteenth century development has been widely viewed as a pioneer subsistence agrarian economy.

In fact, a reasonably complex regional economy evolved by 1870 as agriculture, salt, iron ore, and coal were developed in various parts of the region.

Patterns of Agriculture to 1870

Agricultural historian L. C. Gray summarized the region's early agricultural progress as going little beyond "the log-cabin stage of development."⁵ Initial farming efforts involved the raising of beans, corn, and pumpkins in small clearings.⁶ Increased production was generally realized by the slow process of clearing more land and prospects for agricultural surpluses were remote, since households often included 10 to 15 children.⁷ Agricultural improvements were also retarded because many of the pioneers were more inclined to hunting than to systematic farming.⁸ As late as 1835, many farmers

⁴Caudill, op. cit., pp. x-xii; Davis, op. cit., p. 156; White, Foscue, and McKnight, op. cit., p. 207.

⁵L. C. Gray, History of Agriculture in the Southern United States to 1860, Vol. II (Gloucester: Peter Smith, 1958), p. 884.

⁶Ibid., p. 867.

⁷Campbell, op. cit., p. 45.

⁸Gray, op. cit., p. 867.

devoted time to gathering and hunting or trapping; raccoon and opossum hides, rather than money, were frequently taken in payment of state revenues.⁹ Common exports from the region's farms included small quantities of ginseng, furs, deer hams, chestnuts, honey and beeswax.¹⁰ These items were marketed through small trade centers such as Louisa, in Lawrence County, where they were sent down the Big Sandy River to the Ohio.¹¹ During the early settlement period hunting and gathering, therefore, were commercially more important than agriculture. Mather, writing the state's first geological survey in 1838, observed that the Upper Cumberland River Valley's " . . . products of agriculture . . . were very limited . . ."¹² At about the same time, a resident of Rockcastle County described the area as being a thinly settled region where agricultural production had not greatly exceeded local requirements.¹³ Roads in the region were probably of little poorer quality than those elsewhere in 1830, but the network was thin (Figure II-2). Transportation thus posed further problems in marketing products of the incipient agricultural system.

Between 1830 and 1850 more settlers came in from Virginia, Tennessee, and the Carolinas¹⁴ and the region's population nearly doubled, increasing

⁹Ely, op. cit., p. 195.

¹⁰Gray, op. cit., p. 884.

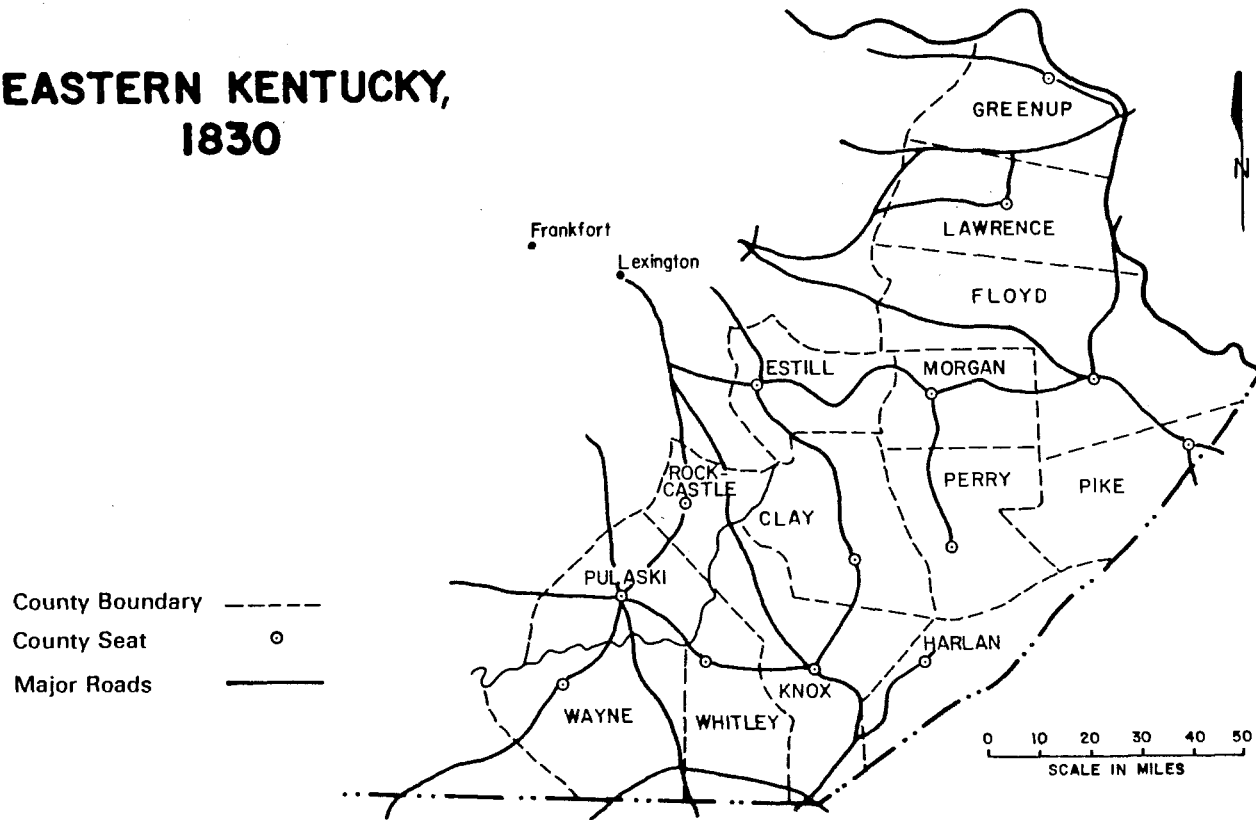
¹¹Ely, op. cit., p. 195.

¹²William Williams Mather, "Report of the Geological Reconnaissance of Kentucky, Made in 1838," Kentucky Senate Journal, 1839, p. 250.

¹³Gray, op. cit., p. 884.

¹⁴McClure, op. cit., p. 161.

EASTERN KENTUCKY, 1830



Source: Fenner and Sears, A New Map of Kentucky, 1830.

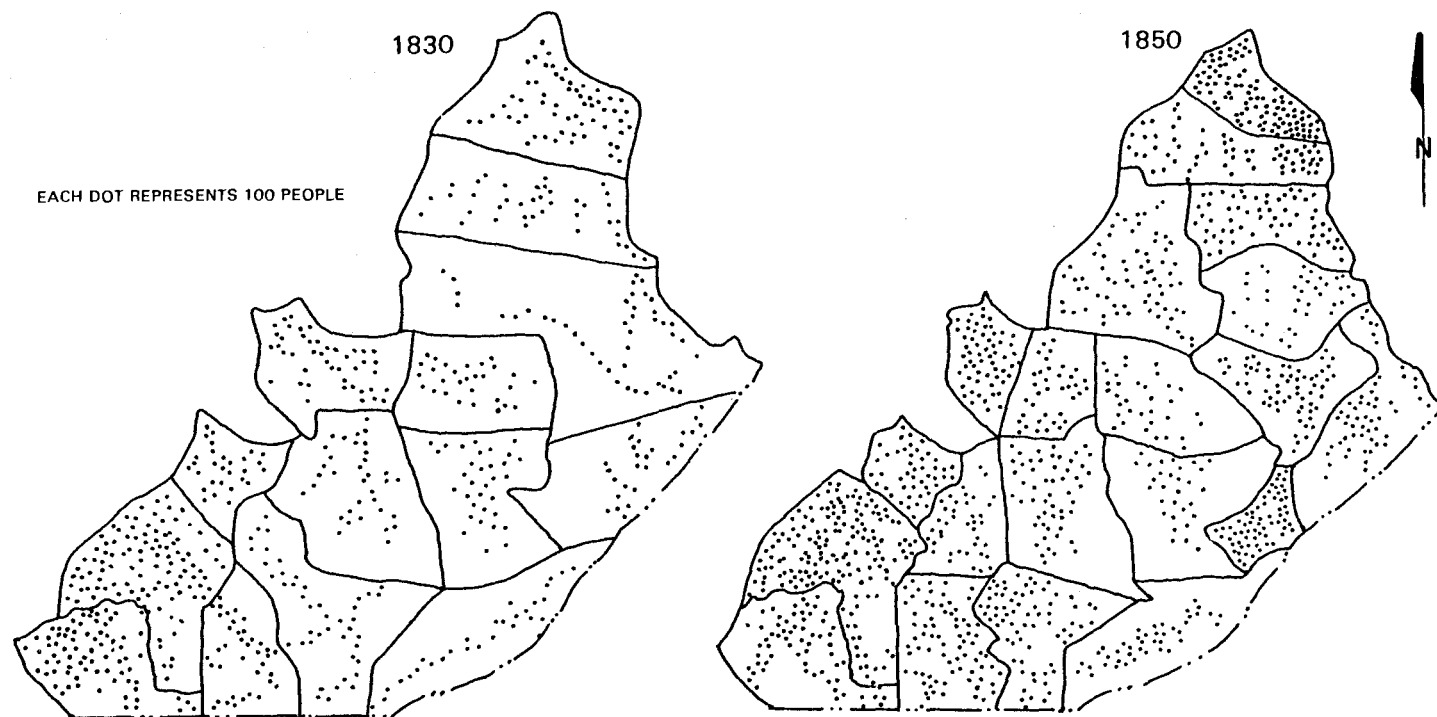
Figure II-2. Eastern Kentucky, 1830.

from 63,229 to 123,587.¹⁵ Notable increases occurred in the north in Greenup County, in the southwest in Pulaski County, and in the southeast from Whitley County to Pike County (Figure II-3). It should be noted that Breathitt, Johnson, and Owsley counties were formed between 1830 and 1850, thus accounting for boundary changes and their appearance on Figure II-4. Greenup and Pulaski counties were more accessible and had more open agricultural land. Growth in the southeastern area however, seems to have been a response to its proximity to population movements from Tennessee, Virginia, and North Carolina rather than agricultural opportunity. Agricultural productivity in these more mountainous counties, such as Breathitt, Floyd, Harlan, Perry, and Pike, compared unfavorably with other highland areas west of the Blue Ridge. Although farms often exceeded 100 acres, improved acreage seldom accounted for more than twenty percent of the total farmland (Figure II-4). Relatively small acreages were devoted to crops. Except for sheep production, agriculture in this part of eastern Kentucky ranked no higher than third among five regions of similar terrain and population density in 1850. (Table II-1). Small grains such as wheat, rye, and oats received little attention on the Kentucky farms, but even in the production of important staples such as corn and potatoes the region ranked next to last. Livestock, especially swine and cattle, were given more emphasis and had been driven to southern markets and to the Bluegrass or Ohio Valley since about 1830.¹⁶

¹⁵U.S. Bureau of the Census, *Censuses of Population, 1830 and 1850*.

¹⁶Gray, op. cit., p. 884; Verhoeff, *The Kentucky River Navigation*, op. cit., p. 164.

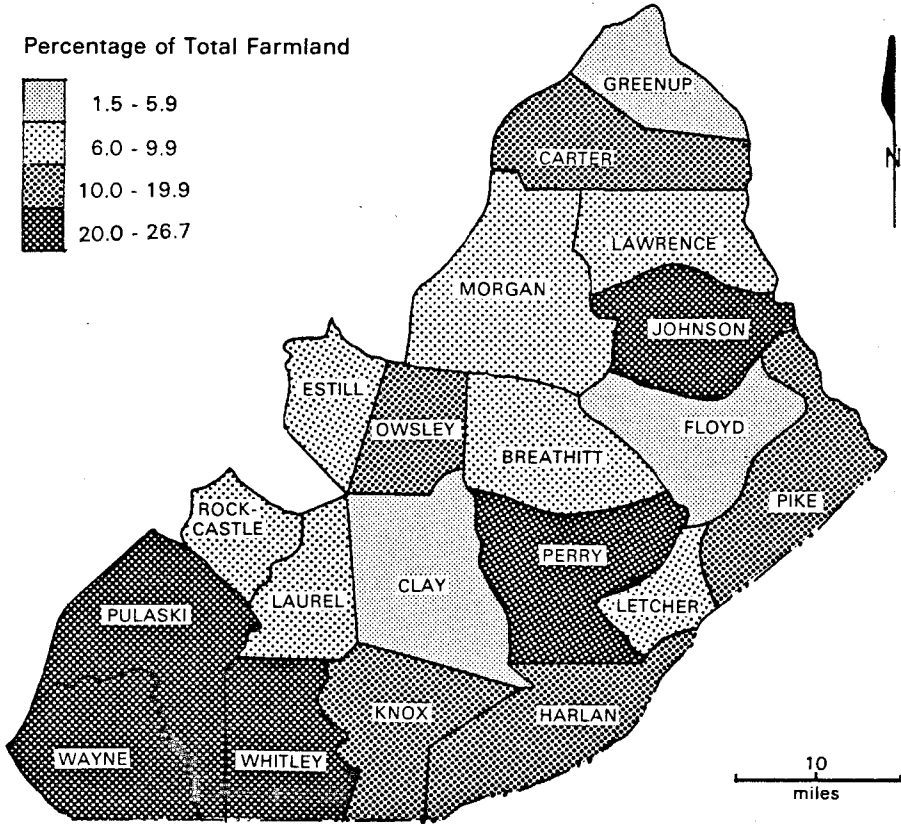
APPROXIMATE DISTRIBUTION OF POPULATION, 1830 AND 1850



SOURCE: U.S. CENSUS OF POPULATION, 1830 & 1850.

Figure II-3. Approximate Distribution of Population, 1830 and 1850.

IMPROVED FARMLAND, 1850



Source: U.S. Census of Agriculture, 1850.

Figure II-4. Improved Farmland, 1850.

TABLE II-1

NUMBER OF LIVESTOCK PER CAPITA AND PRODUCTION PER CAPITA OF
FARM PRODUCTS OF SELECTED AREAS WEST OF THE BLUE RIDGE, 1850

Region	Horses Asses & Mules #	Cattle #	Sheep #	Swine #	Wheat Bu.	Rye & Oats Bu.	Corn Bu.	Potatoes Bu.	Butter & Cheese Lbs.	Hay Tons	Flax Lbs.	Tobacco Lbs.	Wool Lbs.
Kentucky Mtns.*	.24	1.25	1.30	2.74	.27	2.89	39.67	2.72	9.60	.05	1.68	.50	2.28
Virginia Mtns.	.33	1.90	1.84	1.63	4.08	12.45	29.67	1.11	14.04	.54	3.20	.94	3.83
Cumberland Plateau	.31	1.10	.88	4.18	.67	6.37	42.16	4.23	9.08	.07	1.87	1.68	1.55
Missouri Ozarks	.46	1.63	.99	3.00	2.62	6.02	58.12	2.88	13.82	.03	.76	2.11	2.06
N.W. Georgia	.25	.83	.56	2.45	1.26	4.24	41.89	6.14	6.62	.01	(a)	.49	.95

*Breathitt, Floyd, Harlan, Perry, and Pike Counties.

(a) Amounts too small to equal .01 percent.

Source: L. C. Gray, History of Agriculture in the Southern United States to 1860, Table 33, p. 876.

Agricultural development in eastern Kentucky lagged behind that elsewhere in the state as well. In 1850, only Pulaski County was reported as having farms with a total cash value of more than \$1,000,000, just two-thirds of the average for Kentucky counties.¹⁷

Although county-level values were uniformly low, manuscript census returns indicate that substantial variations in farming practices occurred. Crop and livestock selections rested with the individual farmer's preferences and resources, but were presumably influenced by the quality of farmland and by transportation facilities which affected marketing. Comparison of four randomly selected farms of similar size, but varied geographic settings, illustrates diversity within the region's agriculture in the mid-nineteenth century (Table II-2). Better transportation networks served the Pulaski and Greenup County farms (Figure II-5). The cash value of the sample farms in these counties were significantly higher than that of the less accessible Letcher and Perry county operations. Livestock, although less numerous in Greenup and Pulaski counties, were more valuable. With the exception of corn, crop production received more attention in the less mountainous counties, while livestock were of greater importance in Letcher and Perry counties.

¹⁷ U.S. Bureau of the Census, Census of Agriculture, 1850, p. 625.

TABLE II-2

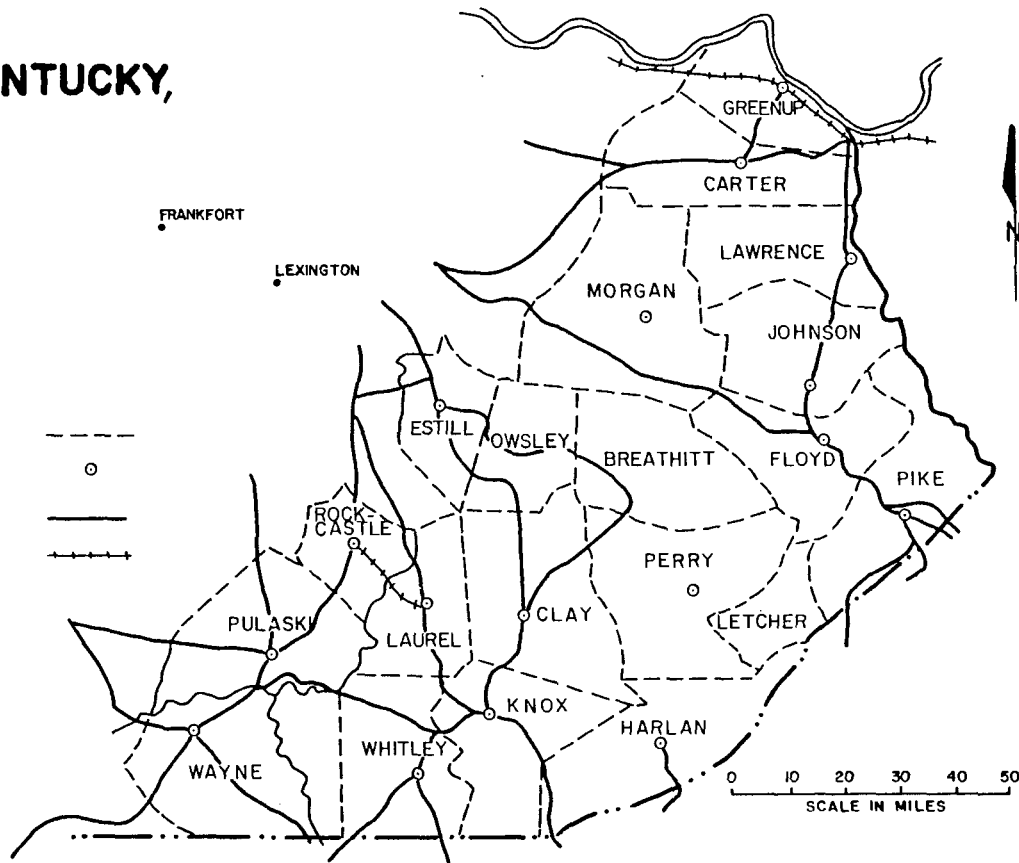
INDIVIDUAL FARMING OPERATIONS, 1850

	Barnes Farm (Pulaski Co.)	Jacobs Farm (Greenup Co.)	Caudill Farm (Letcher Co.)	Miller Farm (Perry Co.)
Improved Acreage	55	25	30	30
Unimproved Acreage	65	135	140	300
Cash Value	\$2,000	\$960	\$300	\$300
Livestock				
Horses	3	3	3	3
Milk Cows	3	2	5	4
Cattle	3	2	6	5
Sheep	7	11	28	10
Swine	27	23	15	30
Value of Livestock	\$ 135	\$211	\$125	\$100
Value of Home Manufactures	\$ 30	\$ 11	\$ 75	\$ 50
Value of Animals Slaughtered	\$ 100	\$ 40	\$ 44	\$200
Crops Produced:				
Wheat	---	54 bu.	7 bu.	---
Corn	150 bu.	350 bu.	150 bu.	300 bu.
Potatoes	75 bu.	30 bu.	3 bu.	10 bu.
Sweet Potatoes	3 bu.	---	15 bu.	30 bu.
Oats	50 bu.	75 bu.	8 bu.	---
Tobacco	---	---	4 lbs.	4 lbs.
Peas & Beans	15 bu.	---	3 bu.	---
Butter	100 lbs.	30 lbs.	120 lbs.	300 lbs.
Wool	20 lbs.	24 lbs.	30 lbs.	10 lbs.
Flax	---	---	20 lbs.	---
Beeswax & Honey	100 lbs.	---	57 lbs.	70 lbs.
Maple Sugar	---	---	30 lbs.	---

Source: Manuscript Census of Agriculture, 1850. Returns for Enoch Barnes farm, Pulaski County; William Jacobs farm, Greenup County; Stephen Caudill farm, Letcher County; and Andrew Miller farm, Perry County.

EASTERN KENTUCKY, 1850

County Boundaries
County Seats
Major Roads
Railroads



Source: Coperthwait, A Map of Kentucky, 1850.

Figure II-5. Eastern Kentucky, 1850.

Swine were important in both areas, but cattle and sheep were more typical on sample farms in the mountain counties, even though their value suggests that they were apparently of lesser quality. These livestock eased the problems of agricultural utilization of mountainous terrain as well as perishability in marketing. Cattle could be pastured in woodlands and driven to sale at tanyards, finishing areas, or other markets. Sheep were ideally suited for rough pasturage; wool was non-perishable. Sheep husbandry frequently appeared in the literature as a suggested agricultural improvement well into the twentieth century. During the 1800's, enough wool was produced to support wool carding at many grist mills. Similarly, dairy products accounted for greater productivity on the Letcher and Perry county farms than did potatoes and grains. When the first state agricultural reports were compiled in 1877, correspondents observed that because of distance from markets, Letcher County farmers raised cereal crops for home use only.¹⁸ The amounts of butter, wool, flax, beeswax and honey produced in the less accessible mountain counties may indicate that these items were difficult to obtain and thus meant for home consumption. Prime agricultural land was less abundant in the mountains and was devoted to a broader variety of production. Home manufactures such as wearing apparel and household textile goods not easily obtained in more remote areas

¹⁸Kentucky Bureau of Agriculture, Kentucky, Its Resources and Present Condition, First Annual Report, 1878 (Frankfort: S. I. M. Major, Public Printer, 1878), p. 446.

were reported in far greater values on farms in Letcher and Perry counties.¹⁹

The value and output of the agricultural sector increased slowly into the 1870's. Potatoes, wool, and tobacco were produced in nearly every county, but the most important commodities in the region were swine and corn.²⁰ Both were well-suited to the limited agricultural technology of the period. Corn, which had been dominant at the time of the first agricultural census, was easy to store, produced reliable yields with minimum inputs, and appeared at mealtime with monotonous regularity.²¹ Swine, also a dietary staple, were presumably fattened on corn but were commonly allowed to feed on forest mast.²² The general state of livestock husbandry was relatively simple. Even in Pulaski County, which had the highest value of livestock production,²³ typical cattle herds consisted of a "scrub" or native stock brought in by settlers from Virginia and North Carolina.²⁴ Further evidence of a less intensive approach to livestock raising was indicated in the use of

¹⁹Rolla M. Tryon, Household Manufactures in the United States, 1640-1860, Vol. V in Reprints of Economic Classics (New York, 1966). First published in 1917, pp. 188, 241.

²⁰U.S. Bureau of the Census, Productions of Agriculture, 1870, pp. 158, 162.

²¹George E. Vincent, op. cit., pp. 1-20.

²²Kentucky Bureau of Agriculture, 1878, op. cit., pp. 446, 535, and 609.

²³U.S. Bureau of the Census, Productions of Agriculture, 1870, op. cit., pp. 158, 162.

²⁴Kentucky Bureau of Agriculture, 1878, op. cit., p. 550.

eastern Kentucky pastures by cattlemen from outside the region. Cattle from the Bluegrass were being driven into highland meadows in Morgan County for summer pasturing. Both cattle and sheep from other parts of Kentucky and from Virginia were being pastured in Harlan County.²⁵

Interaction with areas such as the Bluegrass Region eventually resulted in an upgrading of the quality of livestock in the mountains. Scrub stock in nearby Estill County gave way to improved herds and in Laurel County some innovative farmers replaced scrub cattle with Devons and Shorthorns.²⁶ In spite of the relative underdevelopment of the livestock industry, it can be documented that animals were driven to markets outside the region. Mules and hogs from Rockcastle County were sent to the Lower South and to Louisville. Cattle from Whitley County were either marketed in adjacent counties or driven to Tennessee.²⁷ In view of transportation facilities and distance from markets, livestock emerged as the region's most logical and valuable agricultural export.

Over half of the counties reported values of agricultural products in excess of \$250,000 in 1870 (Figure II-6), but only Pulaski County (with over one million dollars) surpassed the state average of \$890,000.²⁸ In 1878, the State Agricultural Commissioner attributed the low level of

²⁵ Ibid., pp. 387, 510.

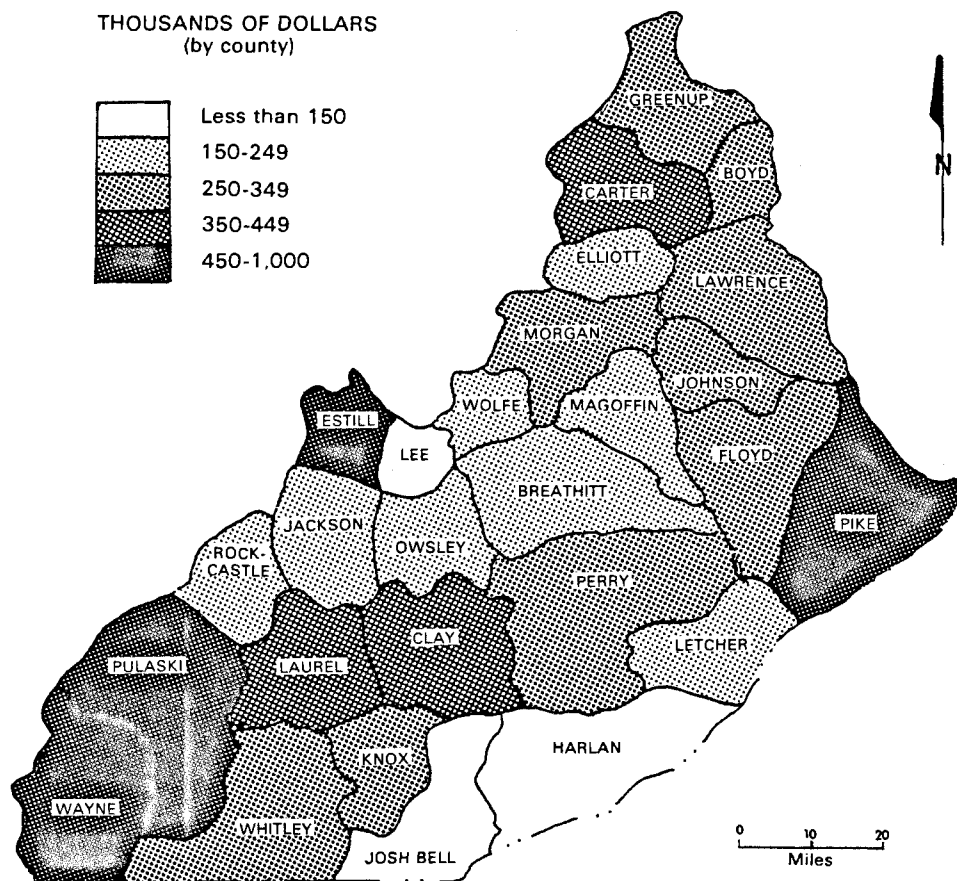
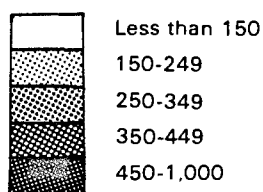
²⁶ Ibid., pp. 341, 434.

²⁷ Ibid., pp. 555, 509.

²⁸ U.S. Bureau of the Census, Productions of Agriculture, 1870, pp. 158 and 162.

VALUE OF AGRICULTURAL PRODUCTS, 1870

THOUSANDS OF DOLLARS
(by county)



Source: U.S. Census of Agriculture, 1870.

Figure II-6. Value of Agricultural Products, 1870.

commercialism to a lack of transportation facilities, rather than the people's cultural attitudes.²⁹ A comparison of the patterns of the value of agricultural products (Figure II-6) and patterns of transportation (Figure II-7) offers further evidence of the relationship between agricultural production and the quality of transport facilities. The relationship was most apparent in Wayne, Pulaski, Laurel, and Clay counties, which formed a contiguous block of high values in an area with better developed transportation. Bell, Harlan, and Letcher counties displayed low values that corresponded to a poorly developed transportation network in the southeastern part of the area.

Because agriculture was the chief occupation for so many within the region, county-level values were also strongly influenced by the distribution of population (Figure II-8). When computed on a per capita basis, patterns of agricultural values roughly paralleled those of the county aggregates, but notable exceptions appeared in the more sparsely populated southeastern counties.

Manufacturing Related to Agriculture

As agricultural production increased, local manufacturing developed to process and mill farm products. By 1850, a fragmented regional pattern of these industries appeared in support of local demands. In some counties the processing of agricultural items contributed

²⁹Kentucky Bureau of Agriculture, 1878, op. cit., pp. 446, 540, 544.

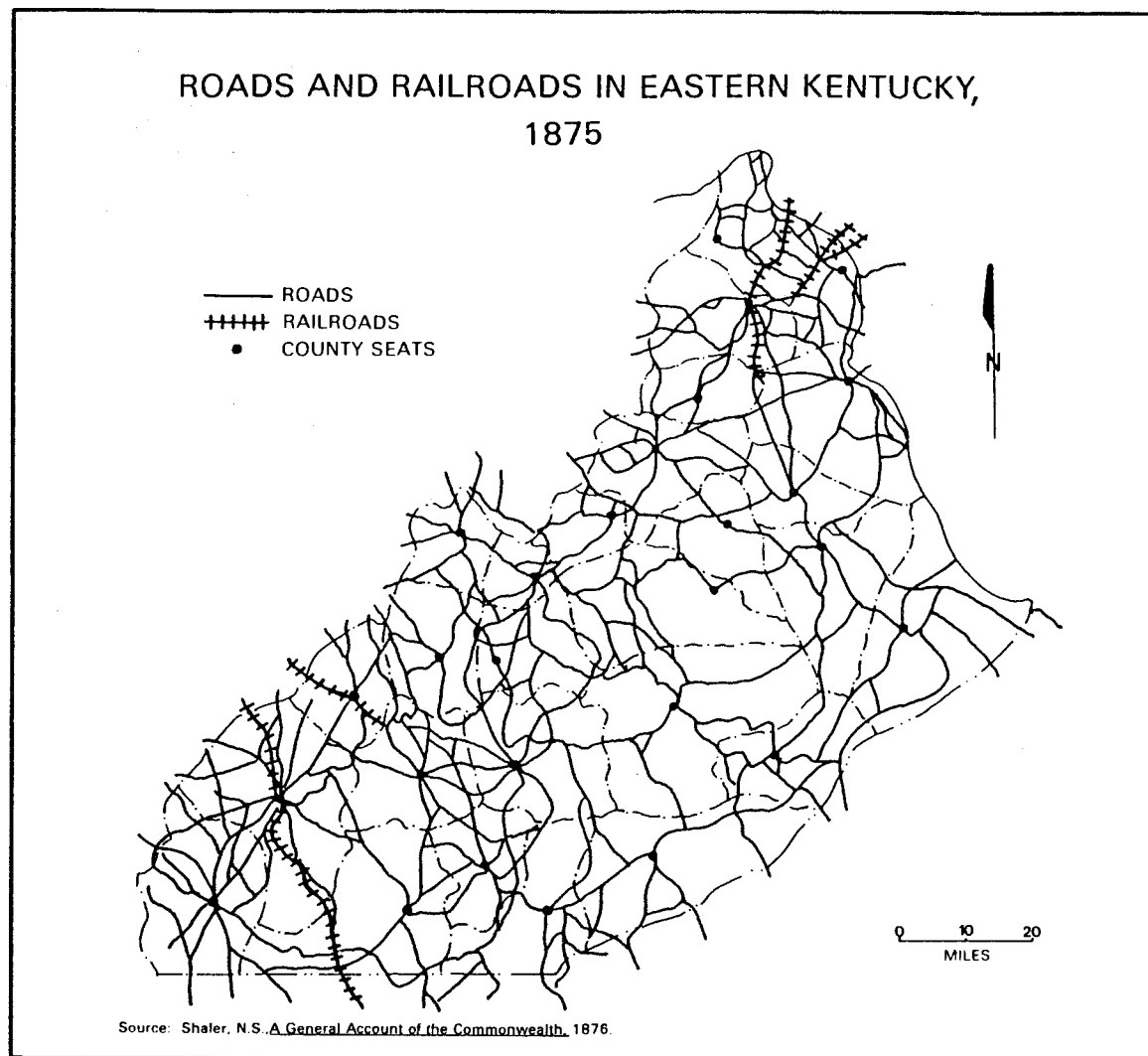
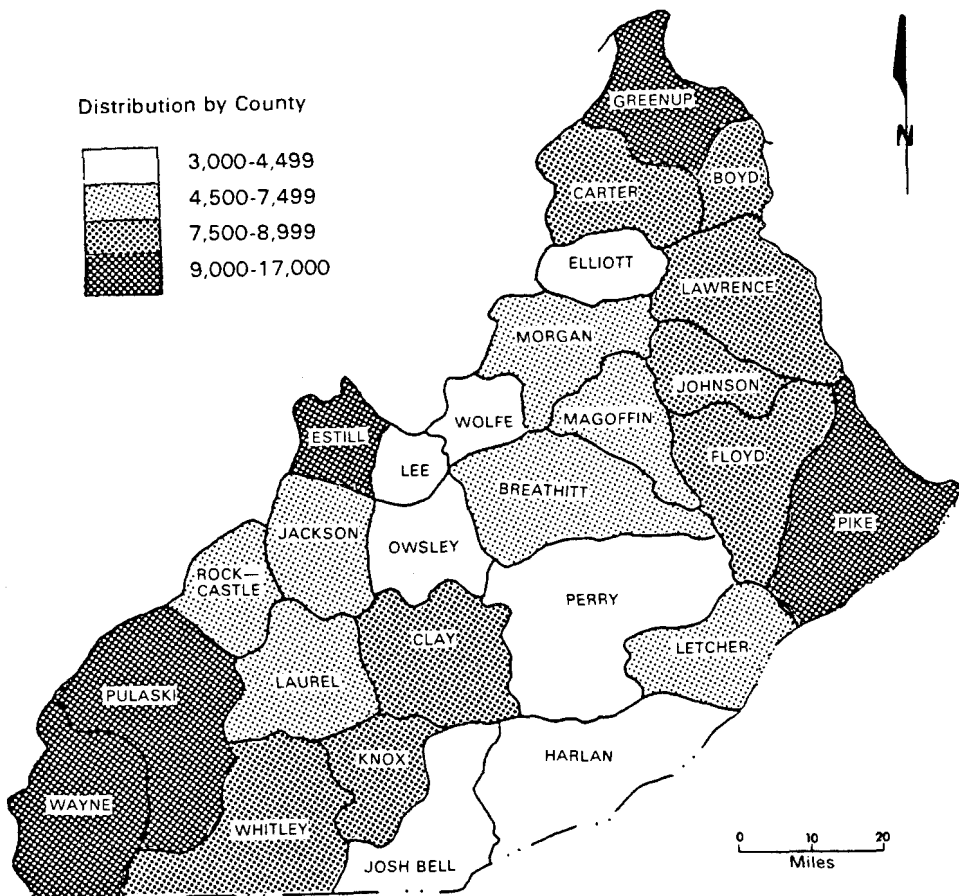


Figure II-7. Roads and Railroads in Eastern Kentucky, 1875.

POPULATION, 1870



Source: U.S. Census of Population, 1870.

Figure II-8. Population, 1870.

heavily to early manufacturing structures (Figure II-9). The value of these enterprises was low and only in Greenup, Rockcastle, and Pulaski counties did the value of manufactures directly related to agricultural processing exceed \$10,000.³⁰

Most common among these activities were grist mills, which frequently operated in combination with wool-carding mills, sawmills, and leather tanning yards. Leather tanning accounted for the highest values and the making of boots, shoes, and saddles appeared as the most recognizable agrarian-industrial spin-off within any of the region's counties.³¹ Grist mills were more numerous than other functions, and operated at smaller scales. In Harlan, Letcher, Morgan, Perry, and Whitley counties, for example, no single establishment met the minimum value of \$500 called for in census schedules.³² Farm-related industries gradually expanded over the next two decades to form areal patterns which were more complete than the fragmented development characteristic of the 1850's. Forty-five establishments enumerated in the 1850 Census of Manufactures processed agricultural items. By 1860, the number had increased to 61, and in 1870, 158 such establishments were included in manuscript census returns.³³

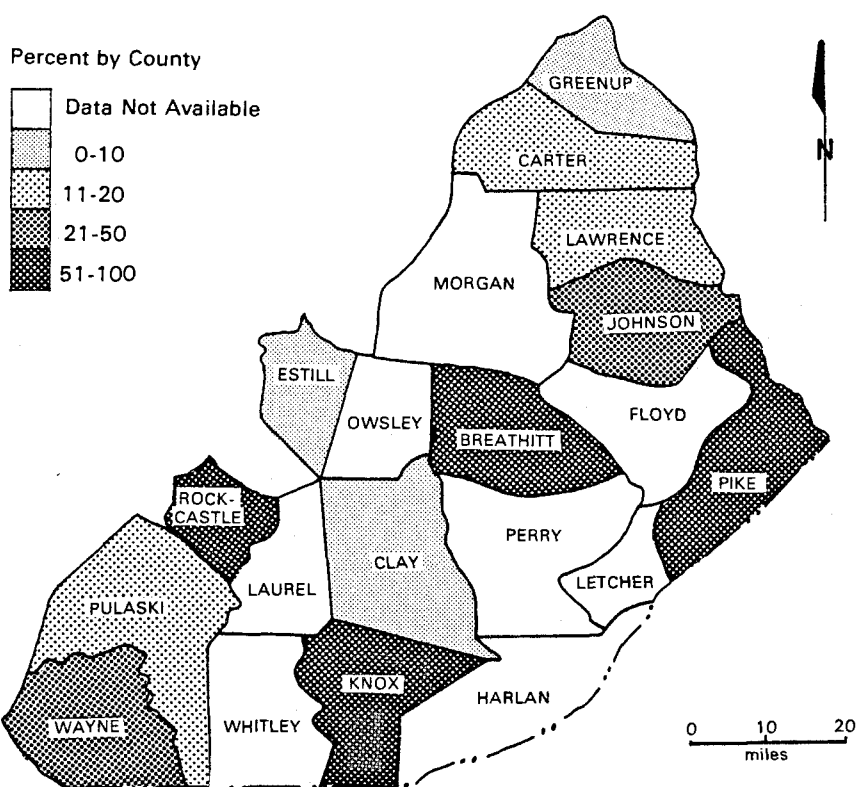
³⁰ U.S. Bureau of the Census, Manuscript Census of Manufactures, 1850.

³¹ Ibid.

³² Ibid.

³³ U.S. Bureau of the Census, Manuscript Censuses of Manufactures, 1850, 1860, and 1870.

Agricultural Processing as a Percentage of the Total Value of Manufactured Goods, 1850



Source: Manuscript Census of Manufactures, 1850.

Figure II-9. Agricultural Processing as a Percentage of the Total Value of Manufactured Goods, 1850.

Home Manufactures

More widespread throughout the agricultural economy were home manufactures. Articles such as blankets, butter, molasses, honey and beeswax were produced under this system and entered local commerce in trade for items such as coffee, sugar, and housewares.³⁴ Home-produced textiles were especially important, having been a traditional part of rural activities of the early settlers. Tench Coxe enumerated such household production for five counties for the census of 1810. (Table II-3).

TABLE II-3

EASTERN KENTUCKY TEXTILE PRODUCTION, 1810 "BLENDED AND UN-NAMED CLOTHS AND STUFF"

County	Production	Value	Looms
Floyd	33,020 yards	\$16,510.00	248
Greenup	20,065 yards	10,032.00	116
Knox	51,884 yards	25,947.00	400
Pulaski	56,411 yards	26,651.00	369
Rockcastle	19,950 yards	9,245.00	109

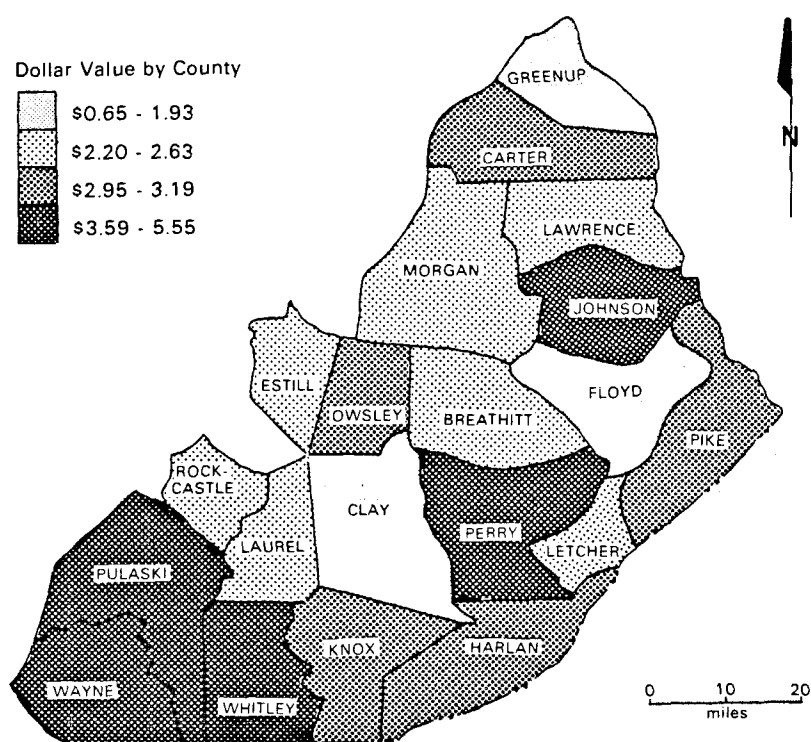
Source: Tench Coxe, "A Statement of the Arts and Manufactures of the U.S., 1810" (Original Book II of the 3rd Census).

³⁴Kentucky Bureau of Agriculture, 1878, op. cit., p. 446.

The primary objective of home manufacturing was to supply the farm family with goods which were otherwise unobtainable or unaffordable, and therefore, they serve as an indicator of the self-sufficiency characteristic of much of the regional agricultural system. In 1850, home manufactures were important throughout the region (Figure II-10). The highest values occurred in areas such as Pulaski County, where agriculture was generally more well developed, and in more isolated counties such as Perry and Johnson. At this time, however, attention given to home manufactures seemed to be, more than anything else, a by-product of an expanding agrarian economy. After 1850, industrialization and urbanization broadened commercial contacts and lessened the dependence on home-manufactured goods. Concentrations of home manufacturing in the eastern United States became an increasingly rural phenomenon, practiced in relatively isolated parts of the country.³⁵ Those features of the geography of home manufactures were partially evident in eastern Kentucky patterns in 1870 (Figure II-11). The lowest per capita values appeared in Greenup, Boyd, and Estill counties, where iron industries were well developed and some urbanization was taking place. Elsewhere, these values were exceeded fivefold in the more populous rural counties in the southwestern part of the area, a concentration quite similar to that of 1850 (Figure II-10). In other counties home manufactures were an expression of the continued expansion

³⁵ Leonard W. Brinkman, "Home Manufactures as an Indication of an Emerging Appalachian Subculture, 1840-1870," West Georgia College Studies in the Social Sciences, Vol. XII (June, 1973), p. 49.

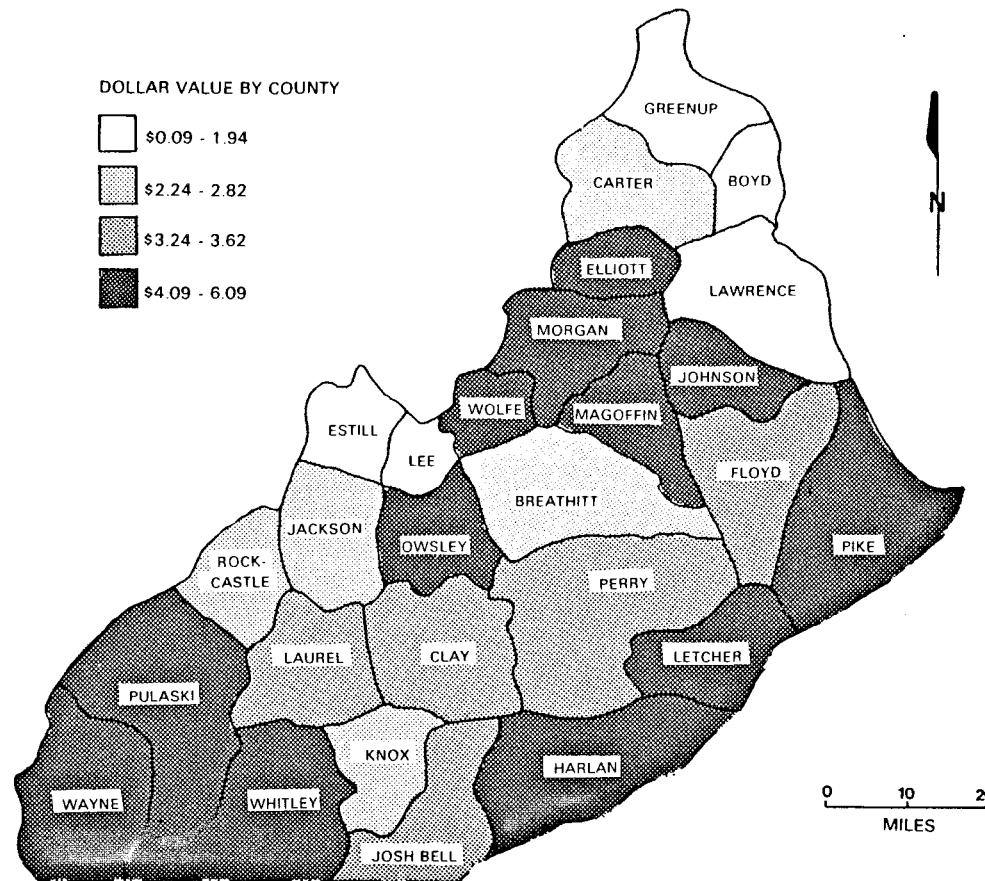
PER CAPITA VALUE OF HOME MANUFACTURES, 1850



Source: U.S. Census of Agriculture, 1850.

Figure II-10. Per Capita Value of Home Manufactures, 1850.

PER CAPITA VALUE OF HOME MANUFACTURES, 1870



Source: U.S. Census of Agriculture, 1870.

Figure II-11. Per Capita Value of Home Manufactures, 1870.

of an agricultural population into areas without railroads and with poor roads.

Mineral Industries

Regional economic development in the nineteenth century also involved the localized exploitation of mineral resources. Although these were secondary to agriculture as a source of livelihood, they created concentrations of employment and industrialization. Salt and iron were among the first to be developed and contributed substantially to early commercial coal mining. The disparate development of salt, iron, and coal also was responsible for significant variations in the spatial structure of the evolving regional economy.

The Salt Industry

By the early nineteenth century the production of salt pork in central Kentucky and the Bluegrass, including shipments of salt-pork down the Ohio and Mississippi to New Orleans, created a demand which surpassed salt production in those two areas.³⁶ At about the same time, the packing of cured and pickled meat products for sale in eastern markets emerged as a sizable industry in the Ohio Valley, especially at Cincinnati.³⁷ With an expanded salt market, the richer although less accessible, brines of eastern Kentucky came into production.

³⁶Thomas D. Clark, "Salt, A Factor in the Settlement of Kentucky," Filson Club History Quarterly, Vol. XII (1938), p. 42-43.

³⁷Clarence F. Jones and Gordon G. Darkenwald, Economic Geography, (New York: The Macmillan Company, 1954), p. 544.

Brine-yielding springs and subsurface waters occurred at a number of places in the region, and some salt was eventually produced in several places (Figure II-12). Two wells and furnaces, producing a few hundred bushels, were established near Manchester in Clay County as early as 1802.³⁸ By 1810 census returns included salt works in Clay, Floyd, Greenup, and Pulaski counties.³⁹ The Little Sandy Lick, near Grayson in Greenup County, produced 89,200 bushels in 1810, with most of the output being marketed in Cincinnati and central Kentucky.⁴⁰

The salt trade stimulated land development and improvements in transportation. The State Legislature quickly recognized that salt supplies were critical to the expanding agricultural economy and granted concessions to promote the industry. In an Act of 1801, for example, salt makers were granted the right of eminent domain to secure wood for boiling brine and to transport brine across property lines.⁴¹ The state government also attempted to bring new areas into production. One thousand acres of public land were opened in Wayne County by a grant to prospective salt makers, with the stipulation that 1,000 bushels of salt would be produced in order for them to retain title to the land.⁴²

³⁸Mary Verhoeff, The Kentucky River Navigation, op. cit., p. 154.

³⁹U.S. Bureau of the Census, Third Census of the United States, 1810.

⁴⁰Ibid., and John A. Jakle, "Salt on the Ohio Valley Frontier, 1770-1820," Annals of the Association of American Geographers, Vol. LIX (December 1969), p. 692.

⁴¹Acts of the Kentucky General Assembly, December, 1801, p. 93.

⁴²Ibid., Jan. 31, 1811, p. 113.

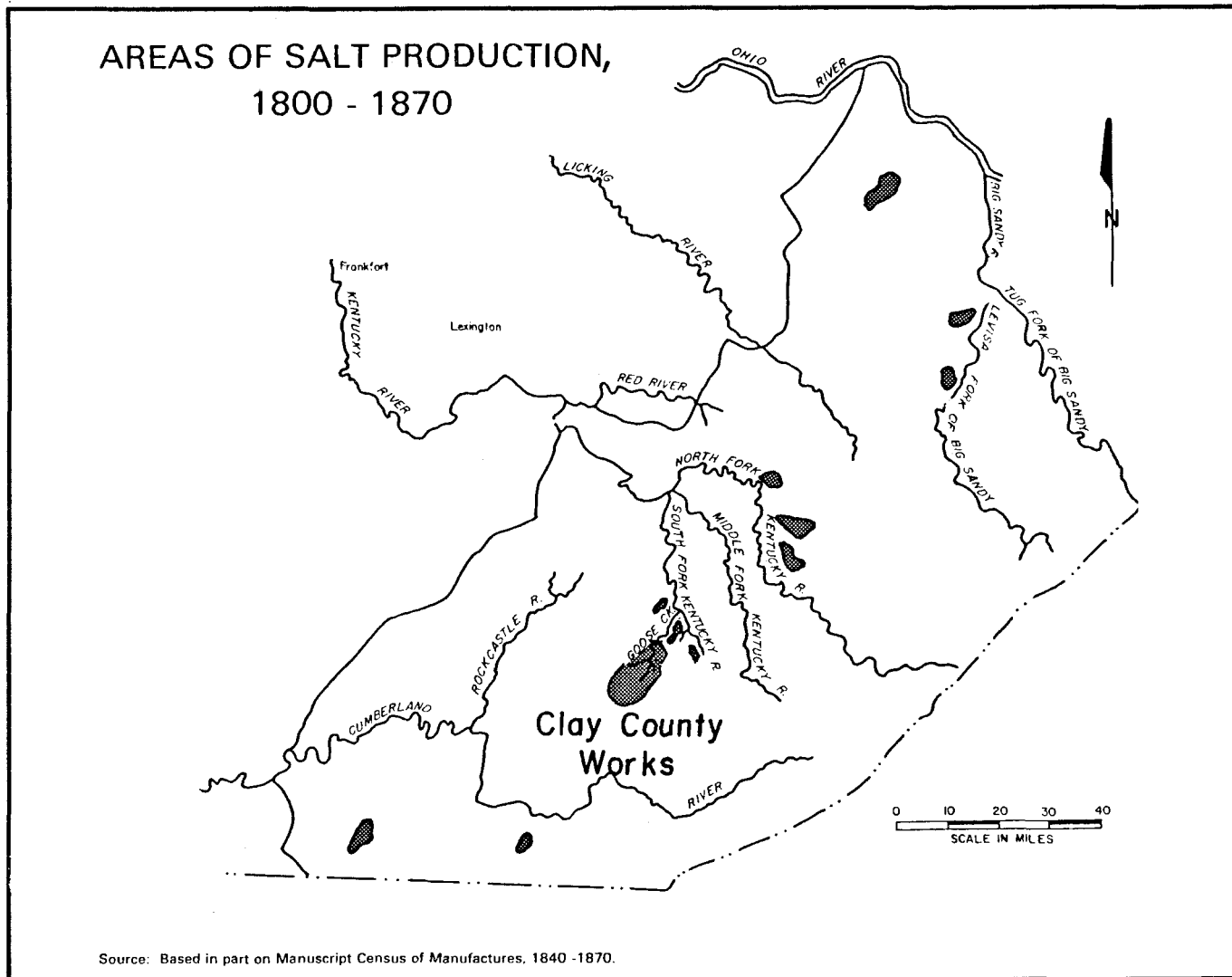


Figure II-12. Areas of Salt Production, 1800-1870.

Similar legislation was enacted for transportation improvements. In 1810 a road connecting the Goose Creek Salt Works in Clay County with the Wilderness Road was built under subsidy of the state government.⁴³ The following year an act established a lottery to raise \$10,000 to clear and straighten the Kentucky River and its tributaries down to the Garrard Salt Works in Clay County.⁴⁴ These legislative measures represented some of the earliest efforts toward internal improvements in the mountain counties and were indicative of what was to become a longstanding awareness of the importance of resources and transportation facilities in the regional economy.

The Clay County works formed the region's most important production area, with approximately fifteen wells producing from 100,000 to 250,000 bushels annually between 1835 and 1845.⁴⁵ Manuscript census schedules for Clay County in 1840 showed 148 employees engaged in the production of 106,000 bushels. Regionally, over 270,000 bushels were produced, providing employment for 230 men.⁴⁶

Marketing of the Clay County salt took two principal directions: northwest to central Kentucky and the Bluegrass Basin, and southeast to the valley of east Tennessee. A stable movement to Louisville and Lexington evolved between 1810 and 1820,⁴⁷ with part of this shipment

⁴³Ibid., Jan. 31, 1810, p. 134.

⁴⁴Ibid., Jan. 10, 1811, p. 113.

⁴⁵Verhoeff, The Kentucky River Navigation, op. cit., pp. 153-154.

⁴⁶U.S. Bureau of the Census, Manuscript Census of Manufactures, 1840.

⁴⁷Jakle, op. cit., p. 698.

being taken by pack animals and wagons via the Wilderness Road and its related network.⁴⁸ Heavier reliance was evidently placed on the South Fork of the Kentucky River, and in the absence of slack-water improvements, production and shipments were keyed to high water periods or "tides," when navigation was more feasible. The industry's sensitivity to water transport was clearly illustrated in the unusually dry conditions of 1818, when only five-thousand bushels, about one-third the amount normally shipped by water alone, were manufactured for sale entirely in local markets.⁴⁹

Southeastern shipments entered Tennessee via Barbourville and the Cumberland Gap, although some salt was marketed in eastern Kentucky counties along the Wilderness Road. Agriculture in east Tennessee was gaining importance, and meat-processing in Knoxville depended upon the Kentucky salt supply.⁵⁰

Salt furnaces in Clay County and Pulaski County produced 216,500 bushels and 3900 bushels respectively in 1850.⁵¹ In 1860 production in Clay and Lawrence counties amounted to 130,500 bushels and employed 76.⁵² Between 1850 and 1870 a growing railroad network in the Corn Belt brought about a westward shift in slaughtering and packing which allowed Chicago to surpass Cincinnati as the center

⁴⁸Verhoeff, The Kentucky River Navigation, op. cit., p. 155.

⁴⁹Kentucky House of Representatives Journal, 1818, pp. 130-132.

⁵⁰Knoxville Register, July 4, 1831.

⁵¹U.S. Bureau of the Census, Manuscript Census of Manufactures, 1850.

⁵²U.S. Bureau of the Census, Manuscript Census of Manufactures, 1870.

of the industry.⁵³ These developments placed eastern Kentucky salt makers farther from areas of growing salt demands. The region's output waned during the uncertain markets of the war years, and by 1870 only Clay County, with 64,000 bushels, remained a significant producer.⁵⁴ Linkages established in the salt trade had helped open parts of the mountain area to outside commercial contact. Although viewed as an area isolated from economic expansion, the region's marketing of salt had contributed to the commercial structure and growth of agriculture in the lower Ohio Valley.

The Iron Industry

Local iron ore, timber, and limestone formed a second resource base for economic development. Furnaces in Estill County were a significant part of the Red River Iron Region, and those in Greenup County, to the northeast, were among the most productive in the Hanging Rock Iron Region (Figure II-13). The first furnace in the Red River Region was built in 1806 or 1808 as a part of the early westward diffusion of the nation's iron industry.⁵⁵ This development preceded that of the Hanging Rock Region by nearly twenty years and was apparently influenced by proximity to Kentucky River markets in Lexington and Frankfort, where Red River iron products were stocked by stores through the ante-bellum period.⁵⁶

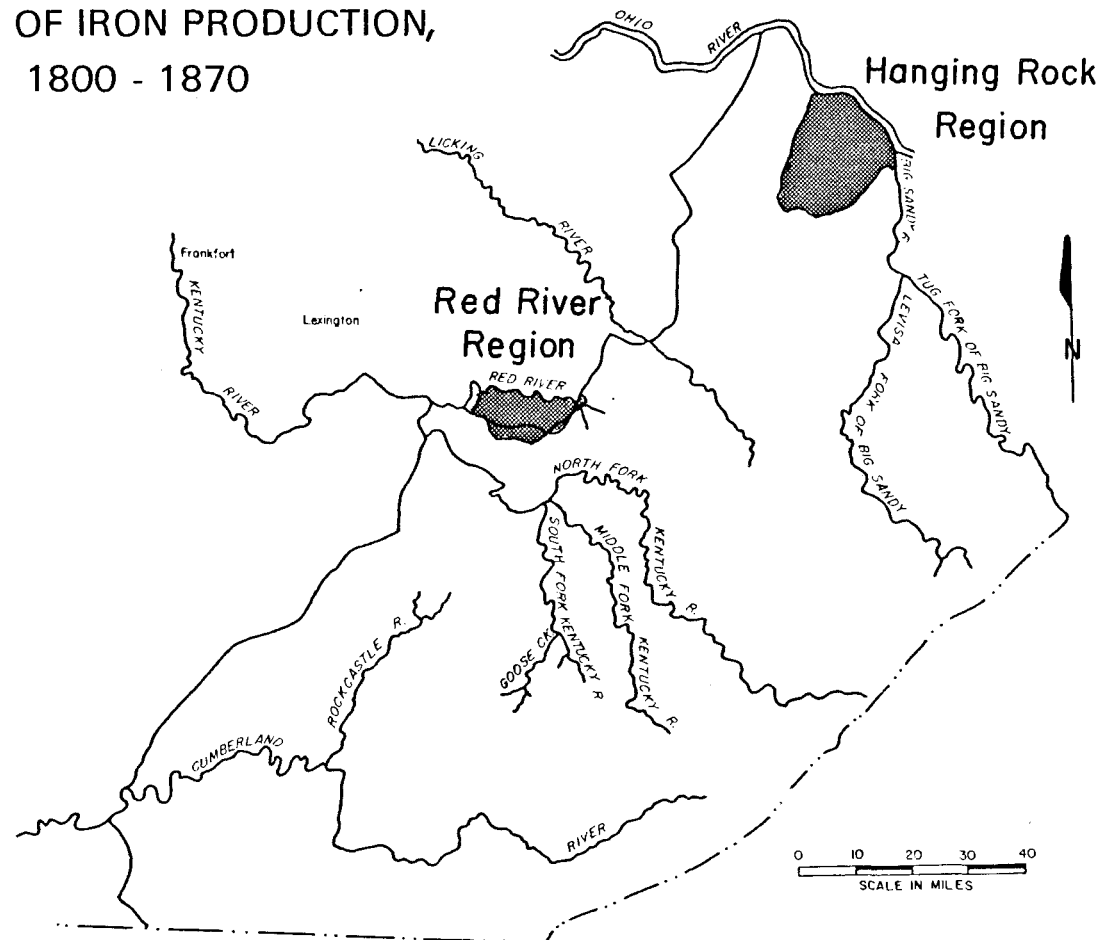
⁵³ Margaret Walsh, "The Spatial Evolution of the Mid-western Pork Industry, 1835-1875," Journal of Historical Geography, Vol. 4, No. 1 (1978), pp. 8-9.

⁵⁴ U.S. Bureau of the Census, Manuscript Census of Manufactures, 1870.

⁵⁵ Geological Survey of Kentucky, Reports of Progress, Vol. IV, New Series, 1878 (Frankfort: S. I. M. Major, Public Printer, 1878), p. 206.

⁵⁶ J. Winston Coleman, "Old Kentucky Iron Furnaces," Filson Club History Quarterly, Vol. XXXI (July 1957), pp. 6-7.

AREAS OF IRON PRODUCTION, 1800 - 1870



Source: Based in part on Manuscript Census of Manufactures, 1840 - 1870.

Figure II-13. Areas of Iron Production, 1800-1870.

Transportation costs limited the Red River iron makers to these Kentucky markets. As late as the 1870's, transfer costs of seven to ten dollars per ton on shipments to Louisville and Cincinnati were considered excessive for producers' profit margins.⁵⁷

Locational shifts in the individual iron works occurred periodically when nearby ores or timber were exhausted. As long as wagon transport was relied upon, distances of more than four miles between ore beds and furnaces were considered too great for profitable operation.⁵⁸ The Red River Iron Works, one of the oldest in the region, was dismantled and moved three times between 1810 and 1860, as distances to ore and timber became prohibitive.⁵⁹ Large timber reserves were especially critical. The Red River furnace used 160 bushels of charcoal in the production of one ton of iron, and larger furnaces required nearly twice that amount. If the region's two largest furnaces had operated at full capacity, 400 acres of timber would have been cleared annually to support each of them.⁶⁰ Experiments in using local coal for smelting proved unsatisfactory because its sulphur content produced finished iron of undesirable quality.⁶¹

⁵⁷ Geological Survey of Kentucky, Reports, op. cit., p. 212.

⁵⁸ James Larry Smith, "The Southern Charcoal Iron Industry 1800-1860," unpublished Ph. D. dissertation, University of Tennessee, Knoxville, 1982, p. 214.

⁵⁹ Verhoeff, The Kentucky River Navigation, op. cit., p. 159.

⁶⁰ Geological Survey of Kentucky, Reports, 1878, op. cit., p. 212.

⁶¹ Ibid., p. 213; Verhoeff, The Kentucky River Navigation, op. cit., p. 157.

In spite of these problems, census returns for 1840 showed 104 men employed at four iron works which produced a total of 900 tons of cast iron and 160 tons of pig iron. Although the Red River Iron Works included the cultivation of 800 acres to support its labor force and draft animals, the concentration of employment provided a market for local agricultural produce and thus established a more diverse economy than was found in neighboring agrarian counties.⁶² Employment and production rose slightly in 1850, when 150 workers turned out 1500 tons of pig and bar iron and 75 tons of nails.⁶³ Output fell below 1,000 tons in 1860, but more than 4,000 tons were produced in 1870, with iron ore mines and charcoal blast furnaces providing employment for 425 people.⁶⁴ Increased production had resulted from the renovation and relocation of two large works in 1866 and 1868. A new town, Fitchburg, was built to accomodate 100 families and the furnaces went into blast in March, 1870.⁶⁵ During the next five years, Estill County's four furnaces turned out over 29,500 tons of iron, almost all of which was shipped down the Kentucky River for fabrication into railway car wheels in the Midwest.⁶⁶

⁶²Smith, op. cit., p. 244.

⁶³U.S. Bureau of the Census, Manuscript Census of Manufactures, 1850.

⁶⁴U.S. Bureau of the Census, Manuscript Census of Manufactures, 1860 and 1870.

⁶⁵Richard H. Collins, Collins' History of Kentucky, Volume II (Covington, 1874), p. 168.

⁶⁶Geological Survey of Kentucky, Reports, 1878, op. cit., p. 208.

By contrast, more extensive resources and less complex transportation problems gave greater success to iron-making in Greenup County. Although demands on timber resources were similar to those in Estill County, the distribution of iron ore was more widespread and relaxed the constraints associated with the transportation of both wood and ore.⁶⁷ Between 1822 and 1834, eleven furnaces were built in the county, and it became the leading producer in the Hanging Rock Region⁶⁸ (Figure II-14). In 1837, the Bellefonte and Raccoon furnaces each produced over 1,000 tons of pig iron and castings, while the other furnaces each turned out between 600 and 900 tons, for a total of 6,600 tons.⁶⁹ By 1840, these works employed 440 men and had more than doubled the 1837 output.⁷⁰ Expansion during the 1830's was an outgrowth of the general development of the Ohio Valley and gave national prominence to iron manufacturing in eastern Kentucky and Ohio. In 1840, the mean annual production of Hanging Rock furnaces was four times greater than that of those in the rest of the country, and the region remained more productive through the mid 1850's.⁷¹ The Hanging Rock iron enjoyed an excellent reputation for foundry purposes in the Ohio Valley and the Midwest.⁷²

⁶⁷Mather, op. cit., p. 261.

⁶⁸Kentucky Geological Survey, Vol. IV, Report C, Eastern Coalfield, 1884 (Frankfort: State Journal Publishing Company, 1884), p. 161.

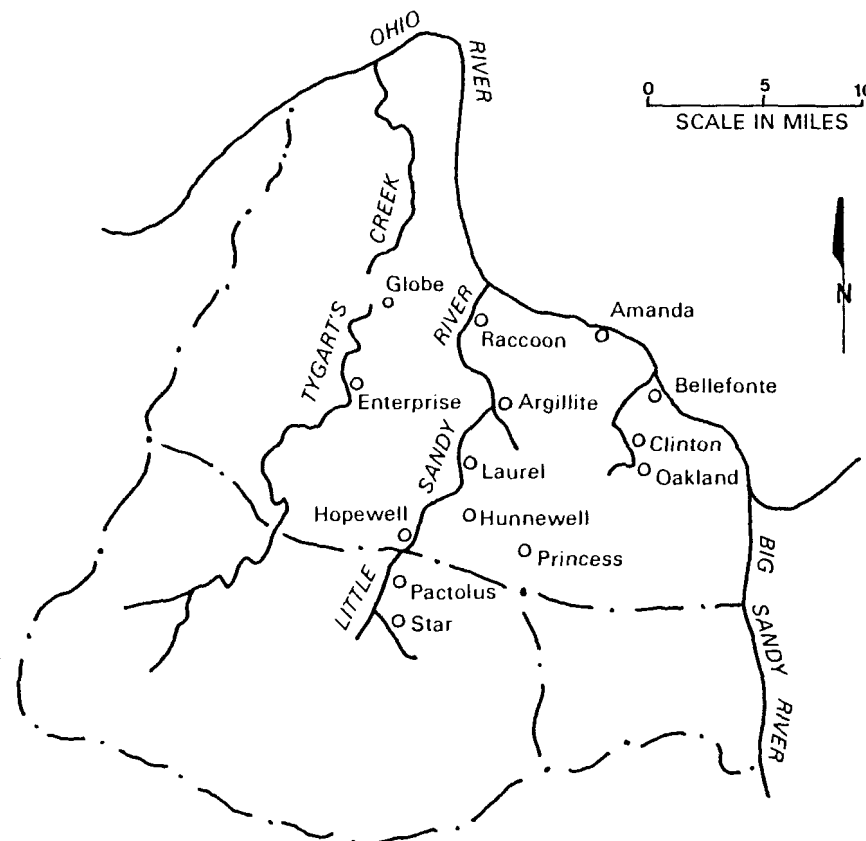
⁶⁹Kentucky House Journal, 1837, p. 262.

⁷⁰U.S. Bureau of the Census, Census of Manufactures, 1840.

⁷¹Smith, op. cit., p. 210.

⁷²Kentucky Geological Survey, Eastern Coalfield, 1884, op. cit., p. 159.

HANGING ROCK IRON FURNACES, 1822 - 1848



Source: Geological Survey of Kentucky, Report C, Eastern Coalfield, 1884.

Figure II-14. Hanging Rock Iron Furnaces, 1822-1848.

The iron was also fabricated into nails, plow points, and related agricultural implements for local use. The success of these early ventures stimulated a second period from 1844 to 1857, when ten additional furnaces were built in the area.⁷³ Production in 1850 included 10,500 tons from Greenup County and 2,400 tons from Carter County, and these areas combined for over 14,000 tons in 1860.⁷⁴ By 1870, employment rose to over 670 and \$765,000 worth of pig iron was manufactured.⁷⁵

These developments in the iron industry also created markets for local agricultural produce. Corn, flour, and bacon, as well as feed for oxen, were among staples supplied by farmers in the district. An estimated \$15,000 worth of such provisions were bought annually by a typical furnace community of the 1850's.⁷⁶

Communities commonly included 50 to 75 cabins, a boarding house, a general store, a school, and a church.⁷⁷ Several of the furnaces operated long enough for permanent settlements to develop at their sites. Argillite, Bellefonte, Hunnewell, Hopewell, Pactolus, and Princess are present-day placenames that originated with the early iron industry. The iron industry, then, played an important role in the process of population distribution and, more importantly, gave this part of eastern

⁷³Coleman, op. cit., pp. 10-11.

⁷⁴U.S. Bureau of the Census, Manuscript Censuses of Manufactures, 1850 and 1860.

⁷⁵U.S. Bureau of the Census, Manuscript Censuses of Manufactures, 1860 and 1870.

⁷⁶Smith, op. cit., pp. 237-238.

⁷⁷Ibid., p. 234.

Kentucky a distinct industrial character which would be retained throughout the development of the area.

The Coal Industry

The early development of coal resources was heavily influenced by the region's stream pattern and by local consumption in the salt and iron industries. For many years streams afforded the only economic means of transportation, and as they cut deeply into the Cumberland Plateau, the nearly horizontal coal seams were exposed for extraction with minimal technology and expense. Although coal was mined in the area during the early 1790's, production was modest because of limited markets. Wood was abundant and more easily transported, and over most of the area only blacksmithing provided a definite market for coal.⁷⁸ Demands for coal in Lexington and Frankfort increased to 700 tons in 1805 and about half was supplied by production in the Kentucky River Basin in Lee and Breathitt counties.⁷⁹ By 1835, shipments to these markets totalled 3,000 tons and linkages between eastern Kentucky and central Kentucky were established via the Kentucky River (Figure II-15).⁸⁰

Mining activities evolved in the late 1820's in the southwestern portion of the Cumberland River Basin (Figure II-15). Beginning in

⁷⁸F. Cuming, "Sketches of a Tour to the Western Country through the States of Ohio and Kentucky, etc., 1807-1809," in Reuben G. Thwaites (ed.) Early Western Travels, Vol. IV (Cleveland: Arthur H. Clark Co., 1904), p. 193.

⁷⁹Verhoeff, The Kentucky River Navigation, op. cit., p. 172; Currens and Smith, op. cit., p. 18.

⁸⁰Kentucky Senate Journal, 1835-1836, op. cit., p. 39.

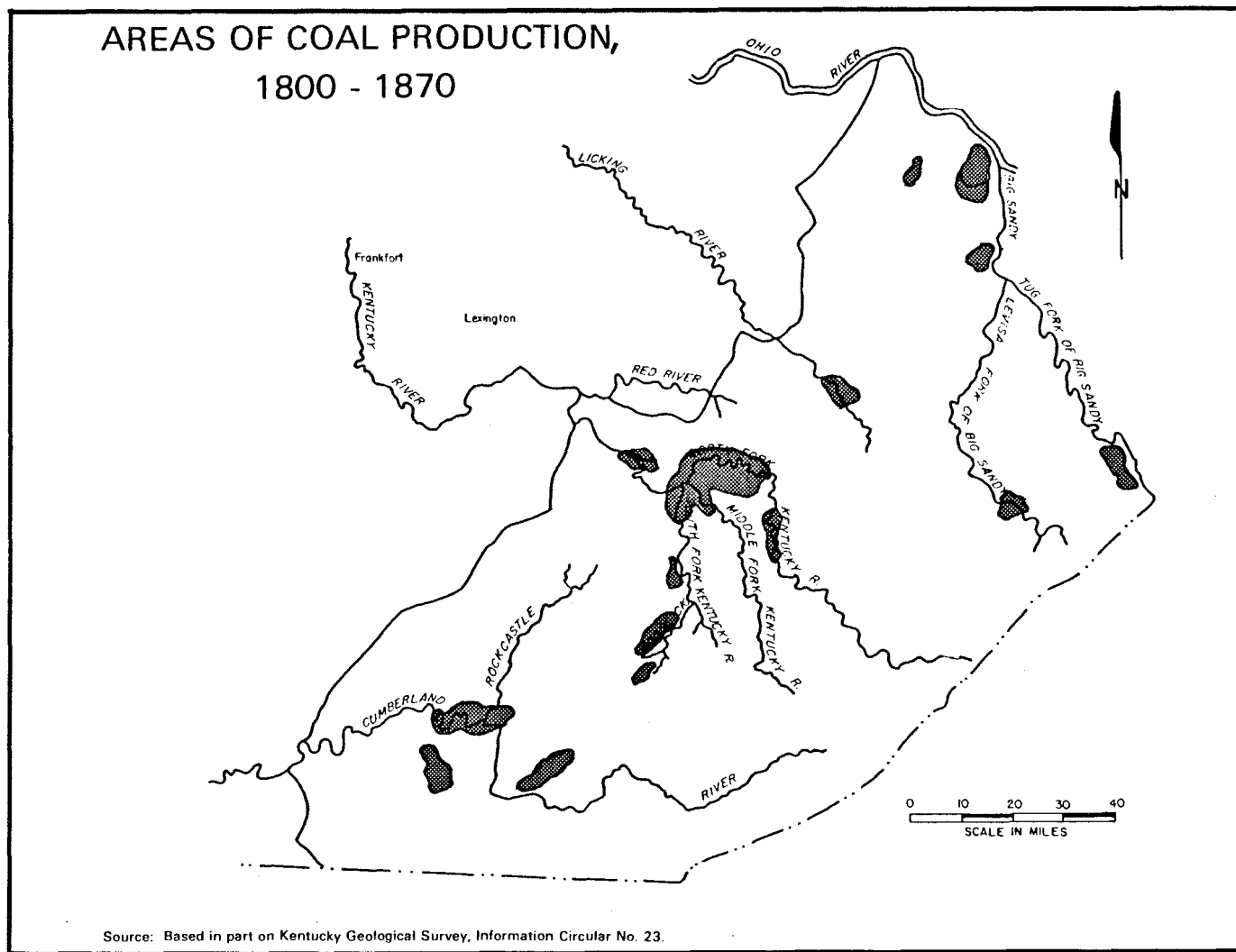


Figure II-15. Areas of Coal Production, 1800-1870.

1827, coal was exported from Wayne, Pulaski, and Whitley counties to rolling mills and foundries in Nashville. Production increased after underground mining methods were employed in 1829, and annual shipments to Tennessee averaged 2,100 tons from 1829 to 1834 and 1,120 tons between 1834 and 1837.⁸¹ The average wholesale price at Nashville was five dollars per ton, netting a substantial income for Cumberland River mine operators, although water transport during the period involved considerable risk.⁸² In 1837 alone, twenty five boat loads of coal, about one-fourth of the total shipments, were lost by sinking on shoals.⁸³ In spite of these difficulties, the tonnage mined was significant for that time.

By 1840, over 12,000 tons were mined, chiefly in the central and southwestern parts of the region.⁸⁴ Sustained production through the 1850's and 1860's occurred in Breathitt County along the Kentucky River and in Pulaski County on or near the Cumberland River, where 61 miners dug over 50,000 tons of coal in 1860.⁸⁵ Smaller amounts were mined in the east in Lawrence and Pike counties, which shipped coal by raft down the Big Sandy River. Other shipments entered into trade down the Ohio

⁸¹Mather, op. cit., p. 249.

⁸²Kentucky Senate Journal, 1837, op. cit., Appendix, p. 54.

⁸³Ibid.

⁸⁴U.S. Bureau of the Census, Manuscript Census of Manufactures, 1840.

⁸⁵U.S. Bureau of the Census, Manuscript Census of Manufactures, 1860.

River from Greenup County.⁸⁶ On the whole, these ventures proved to be more sporadic than steady.

Local consumption of coal by the salt and iron industries also formed a significant pattern in the geography of the early mining industry. Because wood was generally abundant for domestic use, the use of coal by salt and iron makers was the only significant local market.

The manufacture of salt from brine involved boiling the water in large iron kettles or pans until it evaporated, leaving the residue of salt. Large quantities of fuel, usually wood, were required, but coal was used even before timber became locally scarce. The Goose Creek Salt Works, for example, used some coal as early as 1809 and became increasingly dependent on local coal. During the 1830's Clay County's salt works produced 200,000 bushels of salt annually and used a nearly equal amount of coal in the process. While the salt industry operated at this level, local mines were as productive as those exporting coal elsewhere in the Kentucky River Basin.⁸⁷ Coal was also used at other places where both resources were locally available. Such was the case at Carter's Salt Works in Greenup County, the region's second leading producer.⁸⁸

⁸⁶ Mather, op. cit., p. 243.

⁸⁷ Kentucky Senate Journal, 1836, p. 39.

⁸⁸ Mather, op. cit., p. 234.

Greater amounts of coal were consumed in Greenup County's iron industry. Unlike the Estill County furnaces, which relied on water power to drive the blast machinery, all of the Greenup works of the 1830's used steam power.⁸⁹ During the late 1830's and early 1840's an estimated twelve to fifteen thousand tons were mined annually from beds occurring in the same ridges with iron ores.⁹⁰ Charcoal continued to be used for smelting but was later supplemented and finally replaced with local coal.⁹¹ Following expansion of the iron industry during the 1850's, furnaces in Carter and Greenup counties used 18,600 tons of coal in their operations for 1860.⁹² Furnaces built in Ashland in 1869 and at Norton in 1873 used coal, rather than charcoal, for smelting and created additional demands for locally-mined coal.⁹³

Most of the production of the early mines in these parts of the region, was oriented to local, rather than extra-regional, markets. Roughly half of the coal mined to 1870 came from areas where not only coal, but other resources were being developed as well.

Regional Patterns of Manufacturing in 1870

In contrast to the relative uniformity of agricultural values, clearly defined variations appeared in manufacturing (Figure II-16).

⁸⁹Ibid.

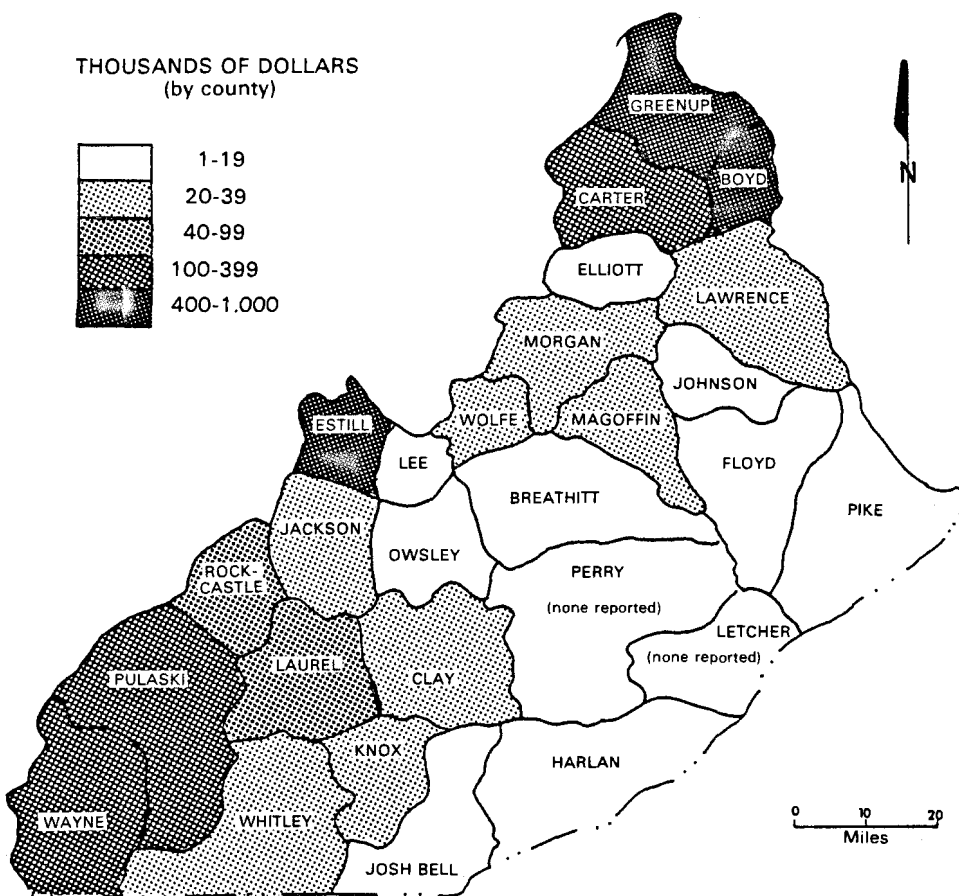
⁹⁰Currens and Smith, op. cit., p. 6, and Mather, op. cit., p. 234.

⁹¹Kentucky Geological Survey, 1884, op. cit., pp. 188-189.

⁹²U.S. Bureau of the Census, Manuscript Census of Manufactures, 1860.

⁹³Kentucky Geological Survey, Eastern Coalfield, 1884, op. cit., p. 186.

VALUE OF MANUFACTURES, 1870



Source: Manuscript, Census of Manufactures, 1870.

Figure II-16. Value of Manufactures, 1870.

The disparate geography of manufactures resulted from the presence or absence of combinations of resources and transportation facilities. A large contiguous pattern of low values occurred in the more mountainous counties, from Bell and Harlan in the southeast, to Breathitt, Floyd, Johnson, and Pike in the central part of the region. Three areas stood out with concentrations of higher values: 1) the Northeastern Subregion, including Boyd, Greenup, and Carter counties; 2) the Southwestern Subregion, including Rockcastle, Laurel, Pulaski, and Wayne counties; and 3) Estill County (Figure II-17).

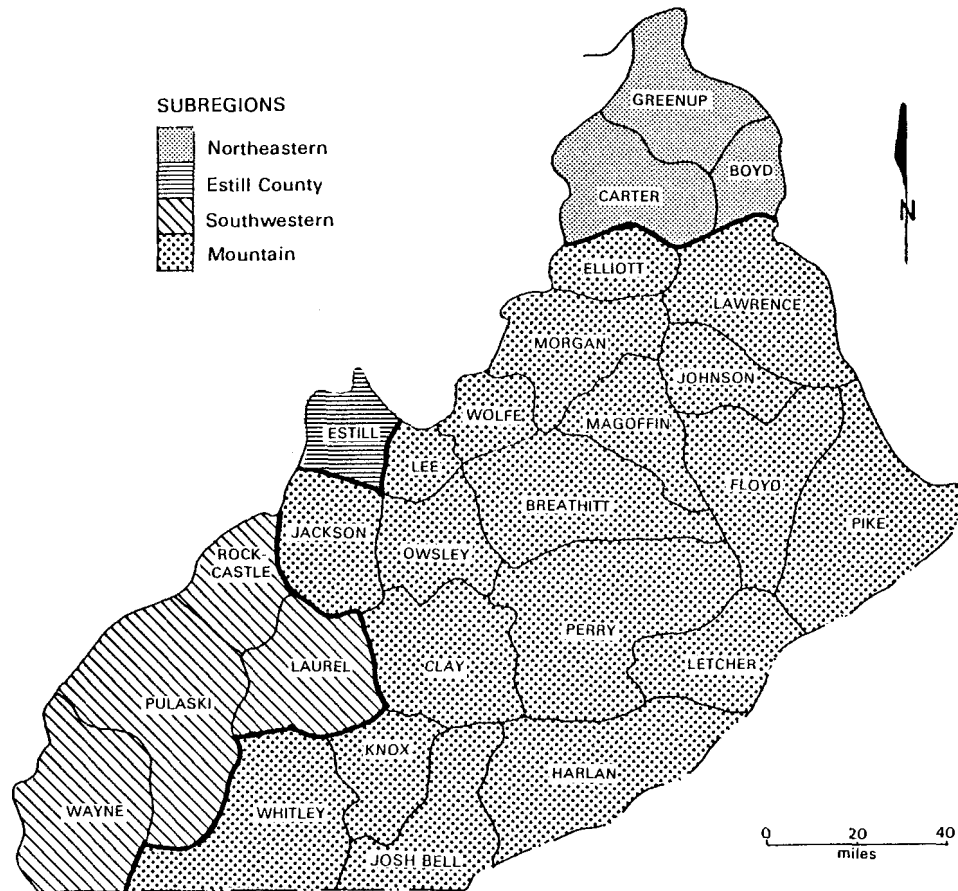
The Mountain Subregion

Lack of diversity as well as low value of total production in manufacturing characterized the less developed Mountain Subregion (Figure II-17). The most common activities were sawmills and grist mills, which were the only establishments reported in census returns for Harlan and Jos Bell counties. Their operation typically required few employees, usually two, or in exceptional cases 10 to 15, and only occasionally did they report a full twelve-month operation. The number of mills was greatest in Breathitt, Johnson, Floyd, and Pike counties, where wool-carding was combined as an additional activity.⁹⁴

Saddleries, tanneries, and blacksmithing were also widespread in these counties of the subregion. Census returns suggest that local or county level linkages between tanneries and saddle and

⁹⁴U.S. Bureau of the Census, Manuscript Census of Manufactures, 1870.

STUDY AREA SUBREGIONS



Source: Delimited by the Author

Figure II-17. Study Area Subregions.

harness making had become established on a commercial scale as they had done twenty years earlier elsewhere in eastern Kentucky. In a number of cases, the output of a tannery was equal to the raw material input of a saddle or boot maker.⁹⁵ These relationships were encouraged by poor transportation, which increased the difficulty of obtaining goods from distant sources. No railroads served the area, and only a thinly developed road network existed (Figure II-7).

Manufacturing contributed less to the overall economy here than elsewhere in the region. No returns were reported for Letcher and Perry counties, and nowhere did the value of manufactures amount to ten percent of the total value of goods sold or manufactured (Table II-4). With manufactured goods being less available, home manufactures assumed relatively greater importance, especially in Harlan, Letcher, Owsley, and Whitley counties. The value of these made-on-the farm articles combined with agricultural values to create an overwhelmingly agrarian economic structure.

Manufacturing in the subregion was strongly oriented to the needs of the agricultural population and featured milling and wool-carding, or the making of plow points, horseshoes, and harnesses. Even in this area where agriculture was more oriented to self-sufficing goals, the process of settlement had given rise to specialized skills and business enterprises.

⁹⁵Ibid.

TABLE II-4

VALUE OF ECONOMIC ACTIVITY IN EACH
SUBREGION BY COUNTY, 1870

Subregion and County	Total Value (dollars to nearest thousand)	Percent of Total Value Contributed by:		
		Agriculture	Home Mfgs.	Manufacturing
Northeastern:				
Boyd	716	39.0	1.0	60.0
Carter	519	71.4	3.7	24.9
Greenup	1,075	24.4	0.1	75.5
Estill County:				
Estill	907	53.7	1.2	45.1
Southwestern:				
Laurel	447	85.0	4.6	10.4
Pulaski	1,354	79.0	6.8	14.2
Rockcastle	329	73.9	4.8	21.3
Wayne	797	73.7	7.8	18.5
Mountain:				
Breathitt	227	87.7	5.9	6.4
Clay	431	84.6	6.5	8.9
Elliott	225	90.5	8.9	0.6
Floyd	359	91.9	7.9	0.2
Harlan	149	83.1	16.4	0.5
Jackson	238	86.2	5.4	8.4
Johnson	383	87.0	8.1	4.9
Josh Bell	172	84.7	7.0	8.3
Knox	350	86.6	6.6	6.8
Lawrence	335	87.7	4.7	7.6
Lee	078	89.3	7.5	3.2
Letcher	187	88.3	11.7	None Reported
Magoffin	257	81.1	7.8	11.1
Morgan	431	84.6	6.5	8.9
Owsley	155	82.1	10.3	7.6
Perry	304	94.9	5.1	None Reported
Pike	577	90.5	7.7	1.8
Whitley	414	79.7	12.3	8.0
Wolfe	233	79.0	7.7	13.3

Source: Compiled from Manuscript Censuses of Agriculture and Manufactures, 1870.

The Southwestern Subregion

Counties in the southwestern portion of the study area differed from the mountain subregion in three ways: 1) agriculture was more productive; 2) better transportation facilities existed; and 3) coal, some iron, and salt resources were being developed in addition to agriculture.

The connection between agriculture and manufacturing was significant. In Laurel County, for example, only four establishments were returned in census figures, but each was engaged in milling flour, which had a much higher value than corn meal. Wayne County's wool-carding and gristmills operated on more of an annual basis than elsewhere in the region, and it was one of the few counties that consistently generated farm surpluses.⁹⁶

Milling and wool-carding accounted for eighty percent of the sixty-four establishments reported for Pulaski County. During the late 1870's reliance was also placed upon mineral resources in the southern part of the county, where salt, iron, and coal industries had been revived by access to the railroad.⁹⁷ The impact of rail transport had also been felt in Rockcastle County with the shipment of coal and lumber to Louisville,⁹⁸ but manufacturing values were also generated by leather

⁹⁶U.S. Bureau of the Census, Manuscript Census of Manufactures, 1870, and Kentucky Bureau of Agriculture, 1878, op. cit., p. 602.

⁹⁷Kentucky Bureau of Agriculture, 1878, op. cit., p. 549.

⁹⁸Ibid., p. 555.

tanning yards.⁹⁹ Although agriculture formed the cornerstone of the industrial base in the subregion, it was developed to production levels which created 250 jobs in manufacturing.

The Estill County Subregion

With 730 employees, Estill County led the region in manufacturing employment. Over half of the jobs were found at iron mines and furnaces, which were reaching peak production after nearly seventy years of operation.¹⁰⁰ Other major job-providing activities such as milling, blacksmithing, harness making, and wagon making developed as spin-offs from agriculture. The level of agricultural activity here was equal to that of the productive areas to the southwest. Farm production and related industries were probably influenced by the presence of the iron industry, as the concentration of manufacturing employment created markets for local agricultural products. Reflecting the stability of the iron industry at this time, manufacturing enterprises carried out business on a less seasonal basis than elsewhere. An overall balance between agricultural and manufacturing values gave Estill County a degree of economic maturity experienced by few counties in 1870 (Table II-4).

The Northern Subregion

Continued growth in the iron industry and superior transportation facilities gave Boyd, Carter, and Greenup counties the most sophisticated

⁹⁹U.S. Bureau of the Census, Manuscript Census of Manufactures, 1870.

¹⁰⁰U.S. Bureau of the Census, Manuscript Census of Manufactures, 1870.

industrial structure in the region. Inter-industry linkages, however, gave Boyd County the greatest industrial diversity in the region, and no other county had more establishments returned in the census of manufactures. A greater number of individual establishments apparently benefitted from the production of iron here than elsewhere. Six separate firms, for example, were engaged in charcoal production. Stonemasons, brickyards, and bricklayers also reported business connected with construction and repair of furnaces. Evidently, iron works in other counties had made such improvements through the use of labor skills from within their own firms. Pig iron was fabricated into stoves, grates, and nails at local foundries; tinnerns and blacksmiths were turning out a variety of articles ranging from cookware to wrought iron and agricultural implements. These products were either marketed down the Ohio River or, in eastern Kentucky, via the Big Sandy River.¹⁰¹

Boyd County's employment opportunities allowed urbanization to develop. Services such as tailoring, dressmaking, and photography, rarely found in other parts of the region, contributed to northeastern Kentucky's distinctive urban environment. The availability of goods and services was also reflected in the low value of home manufactures in Boyd and Greenup counties (Table II-4). Both counties relied heavily on manufacturing, although Greenup was supported primarily by iron, coal,

¹⁰¹Chapman, op. cit., p. 143.

and railway repair shops. Carter County's industrial employment was almost totally concentrated in two iron works.¹⁰²

Industrial labor forces in the subregion created substantial markets for agricultural produce. Milling was well-represented in each county, but leather tanning at Cattlettsburg and in Greenup County exceeded local consumption, as did boot and shoe manufacturing in Boyd County. Large tanyards in the area were in proximity to extra-regional markets and processed skins shipped from counties in the southern part of the region.

Summary

Regional economic development to the 1870's was based heavily on primary activities, especially agriculture and the extraction of natural resources. Both, however, had been developed to levels which generated locally and regionally significant patterns of processing or manufacturing. Spatial variations in accessibility, agricultural potential, and deposits of salt, iron ore, and coal had produced inequities in the distribution of population and economic activity. As a result, well-defined subregional patterns of development had been formed by the 1870's.

Parts of eastern Kentucky had shared in, rather than being isolated from, national economic expansion between 1800 and 1870. Increasing

¹⁰² U.S. Bureau of the Census, Manuscript Census of Manufactures, 1870.

agricultural demands which promoted meat curing and packing in the Ohio River Valley and east Tennessee linked the region to outside areas via the salt trade. Evolving agricultural development also created extra-regional marketing of livestock. Urbanization in central Kentucky and the Ohio River Valley provided outlets for the charcoal, iron industry, as well as some coal and salt. Iron and salt production formed early patterns of mining. Development in the region was similar to that in other places which possessed resources in relative proximity to demand during the nineteenth century.

In 1870 transport links between the Northeast and Midwest were not as well developed as later, and specialized economic regions based on agriculture or large scale urban manufacturing were just beginning to emerge. While these conditions existed, eastern Kentucky's economy was not as far out of the national economic mainstream as it would begin later years.

CHAPTER III

CHANGING PATTERNS OF ECONOMIC ACTIVITY 1870-1890

The American economy experienced remarkable growth between 1870 and 1890 as eastern based capitalists extended industrial technology and corporate organization from the Northeast into the Midwest. In the process, manufacturing supplanted agriculture as the country's chief means of creating wealth.¹ This agrarian-industrial transformation involved a dramatic expansion of the national transportation network. Nearly 111,000 miles of railways were added during the period, creating relatively dense linkages between and within the Northeast and Midwest.² The growth of railways and industry brought unprecedented increases in the consumption of coal, iron, and timber which quickly revealed limitations in the raw material base of the northeastern United States.³ Sustained manufacturing growth and increasing accessibility gradually drew previously remote raw material sources, such as the southern Appalachians, into national patterns of production. The degree to which these regions shared in national economic growth contrasted sharply with that of areas north of the Ohio River. Railnets gave northern areas rapid industrial growth while

¹Harvey S. Perloff, et al. Regions, Resources and Economic Growth. (Baltimore: The Johns Hopkins Press, 1960), pp. 191-195; David A. Shannon, Twentieth Century America: The United States Since the 1890s. (Chicago: Rand-McNally and Company, 1963), pp. 4-5.

²Association of American Railroads, American Railroads: Their Growth and Development (Washington: Association of American Railroads, 1951), maps for the period 1870-1890.

³Perloff, et al. op. cit., p. 195.

places such as eastern Kentucky developed more slowly. Where certain industries were concerned, the more remote areas actually declined in the face of competition from more accessible production points.

For eastern Kentucky, the period 1870-1890 was one of subtle transition rather than rapid growth in economic activity. An end to the region's earliest stage of resource development occurred with the decline of traditionally important iron and salt manufacturing. Coal and timber activities expanded slowly, and the region's economy shifted spatially in response to a change from water to rail transport. Agriculture was less affected by changing transportation and increased its significance in the regional economy, although slowly.

Patterns of Population Change

Population developments reflected shifts in resource-based industries and expanding agricultural settlement. Thinly settled mountain counties became more densely occupied, and concentrations oriented to coal mining appeared.

The region's population reached nearly 318,000 in 1890, an increase of sixty-six percent over the 1870 total.⁴ At the county level, this regional rate of increase was often surpassed, with several

⁴U.S. Bureau of the Census, Census of Population, 1880 and 1890.

counties more than doubling their 1870 populations (Figure III-1). Much of the change could be attributed to natural increase, which became more pronounced in later years, but the areas of considerable growth corresponded more clearly with economic opportunity than they had in the past. Population growth was closely related to agricultural expansion through the central part of the area, as was the apparent filling in of settlement in the more mountainous counties of the southeast. Areas of greatest relative increase, such as Bell, Carter, Laurel, and Whitley counties, reflected the expansion of railroads and coal mining. By contrast, only modest gains occurred in Greenup and Estill counties, where the declining iron industries no longer provided employment. Greenup County's population actually decreased between 1880 and 1890.⁵

The Iron Industry

After nearly sixty years of production, the output of furnaces in the Red River and Hanging Rock regions peaked between 1870 and 1874. During the four year period, the total production of each of the two areas amounted to 28,551 tons and 173,470 tons, respectively (Figure III-2).⁶ Ironically, these successes marked an end to sustained

⁵ Ibid.

⁶ Verhoeff, The Kentucky River Navigation, op. cit., p. 162; Kentucky Geological Survey, 1884, op. cit., p. 193.

IRON PRODUCTION, 1870-1874

Production by County
(Thousands of Tons)



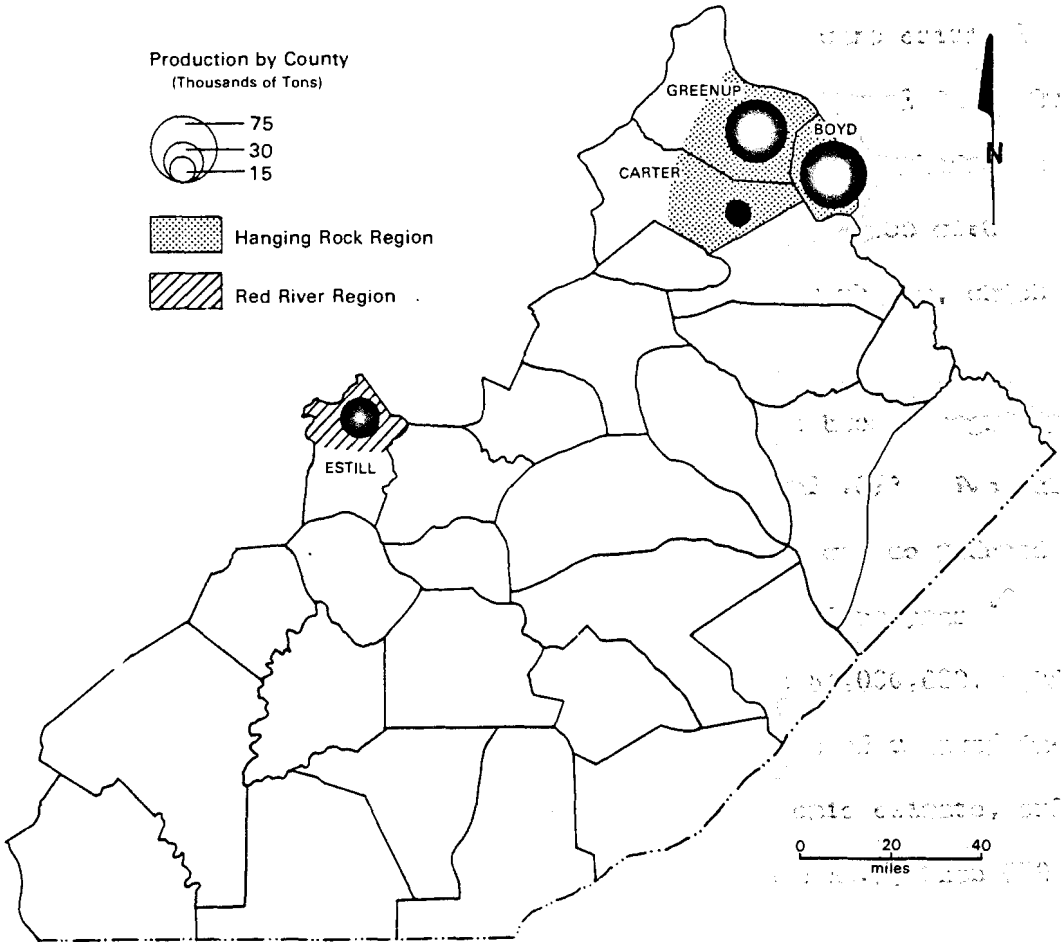
75
30
15



Hanging Rock Region



Red River Region



Source: Kentucky Geological Survey, Reports on Eastern Coalfield, C, 1884

Figure III-2. Iron Production, 1870-1874.

charcoal iron operations in eastern Kentucky.

Among the problems which beset the industry in the mid 1870's was the scarcity of timber for charcoal. Substantial portions of Estill County had been completely denuded, and even the large tracts owned by iron makers in Greenup County had begun to show the stress of continuous exploitation.⁷ Red River iron makers were criticized for their construction of furnaces which were so large that they quickly exhausted local timber and ore reserves.⁸ Timber supplies were critical because the Red River works relied exclusively on charcoal in their "cold blast" operations. Coal suited for "cold blast" methods was unavailable, and this process was required to produce iron with acceptable qualities for finishing into railroad car wheels, which provided the region's chief market.⁹

The adverse effect of poor resource management became magnified by the depressed markets which followed the Panic of 1873. Two furnaces closed in 1874 and the output of the other two was so reduced that total production was only one-third of the previous year.¹⁰ Stockholders in one of the larger enterprises lost \$1,000,000, making other outside investors skeptical and dampening hope of renewed interest in the region. With this discouraging economic climate, only one Estill County furnace returned to production in 1879, when 902 tons

⁷Verhoeff, The Kentucky River Navigation, op. cit., p. 159.

⁸Geological Survey of Kentucky, 1878, op. cit., p. 212.

⁹Ibid., pp. 210-213.

¹⁰Ibid., p. 212.

were manufactured. Ore and timber procurement for this furnace were described by the census agent as being poorly planned and wasteful.¹¹ Sporadic production continued beyond 1880, but none of the other Red River furnaces resumed operation after 1874.¹²

Output in the Hanging Rock District peaked in 1874. Abundant ore and timber made these inputs less critical to profit margins, and high quality local coal permitted 38.5 percent of 1870-1874 production to come from the more economical coal-based smelting process.¹³ In fact the use of coke, rather than charcoal, became increasingly important to continued production. Some of the charcoal furnaces turned out iron for the midwestern car wheel market, but most was used for wrought iron. Coal furnaces, such as those of the Norton Iron Works which opened in the spring of 1874, produced rolled plate and nails.¹⁴

More efficient production in the Hanging Rock District seemed for a time to dampen the impact of the Panic of 1873, but as late as 1878, depressed iron prices and tight money markets suspended activity at some works in Greenup County.¹⁵ Partial recovery in the district was

¹¹U.S. Bureau of the Census, 1880, Vol. XV, Mining Industries, p. 293.

¹²Collins, op. cit., p. 83.

¹³Kentucky Geological Survey, 1884, op. cit., p. 193.

¹⁴Ibid., pp. 159, 189.

¹⁵Kentucky Bureau of Agriculture, 1878, op. cit., p. 739.

realized by 1880 when 1,620 men were employed in the production of 61,161 tons.¹⁶

The collapse of the charcoal iron industry, however, was inevitable, primarily because of competition from Pittsburgh which began to produce pig iron made with anthracite in the mid 1870's. Technologically, anthracite metal was better suited to a variety of secondary manufactures and it undersold charcoal iron by \$10 a ton.¹⁷ Mills in Pittsburgh also prospered during the 1870's as railways shifted to the use of more durable and easily maintained steel rails.¹⁸ Iron and steel makers in the Pittsburgh area capitalized on improved technology and profits from railway expansion at a time when charcoal iron production became less and less profitable. Most Hanging Rock firms suffered from an increasing lack of financial resources which might have allowed them to keep pace with technology and competition.

During the next decade seventeen of Kentucky's eighteen charcoal furnaces closed. In eastern Kentucky, the Hunnewell and Bellefonte furnaces were operating in 1887; the remaining works never effectively recovered from the Panic of 1873. Villages around them were virtually abandoned, removing local markets for farm produce.¹⁹ Only the

¹⁶ U.S. Bureau of the Census, 1880, Vol. XV Mineral Industries, op. cit., p. 293.

¹⁷ Smith, op. cit., pp. 258-267.

¹⁸ William T. Hogan, Economic History of the Iron and Steel Industry in the United States (Lexington: D.C. Heath and Company, 1971), pp. 114-115.

¹⁹ Kentucky Bureau of Agriculture, Horticulture, and Statistics, Seventh Annual Report, 1887 (Frankfort: John D. Woods, Public Printer and Binder, 1888), p. 108.

Bellefonte works in Greenup County remained active in 1890.²⁰ Details of production are unavailable because individual firms exercised the right to avoid disclosure in completing census returns for 1890, but a statewide decrease from 123,751 tons in 1880 to 93,360 tons in 1890 reflected the industry's decline.²¹ Although exhaustion of timber and quality ores was partially responsible for the closing of furnaces, access to high grade Lake Superior ore and cheaper production methods allowed northern works at Pittsburgh, as well as those emerging near Birmingham, to capture the market previously shared by eastern Kentucky furnaces.²² The 1890 tonnage illustrated the rise of coal-based iron near Ashland in Boyd County and a short-lived venture at Middlesboro in Bell County, but iron production on a regional basis had come to an end.

The Salt Industry, 1870-1890

Changing technology in meat processing, outside competition, and depletion of local resources were responsible for a rapid decline in the manufacture of eastern Kentucky salt. In 1880 salt production was profitable only at works in Clay and Breathitt counties. The 40,000 and 2,000 bushels produced in the respective areas represented less than two thirds of the 1870 output for Clay County.²³

²⁰U.S. Bureau of the Census, 1890, Mineral Industries, p. 401.

²¹Ibid., p. 386.

²²Coleman, op. cit., pp. 14-15; Kentucky Bureau of Agriculture, 1887, op. cit., p. 108.

²³U.S. Bureau of the Census, Censuses of Manufactures, 1870 and 1880.

Part of the decline occurred as the meat packing industry improved technology to meet increasing market demands in the eastern United States. The trend was accelerated by the advent of the refrigerated railway car in 1875, a development which effected the transition from cured to processed meat products and reduced demands for salt.²⁴ At the same time, salt producers in Michigan benefitted from expanded transportation facilities in the Midwest to gain competitive advantages at the expense of less accessible areas such as eastern Kentucky.²⁵

Production in eastern Kentucky also became more expensive as the quality of brines decreased. In Clay County it was estimated that one hundred gallons of brine had to be pumped and evaporated to yield one bushel of salt, whereas only eighty gallons had produced a bushel in earlier periods.²⁶

By 1890, no Kentucky firm produced enough salt to total the \$500 minimum value necessary for inclusion in census returns. Production for local markets continued at one Clay County enterprise until 1908, but one of the region's oldest exports had ceased to be significant.²⁷

²⁴Jones and Darkenwald, op. cit., p. 544.

²⁵U.S. Bureau of the Census, Mineral Industries, 1880, op. cit., p. 29.

²⁶Verhoeff, The Kentucky River Navigation, op. cit., p. 154.

²⁷Roy R. White, "The Salt Industry of Clay County, Kentucky," Register of the Kentucky State Historical Society, Vol. L (1952), pp. 240-241.

Forestry, 1870-1890

Except for the wood used as fuel for evaporating vats in salt making and the use of charcoal in iron manufacturing, removal of the region's forests took place on a small scale prior to 1870. Logs had been floated down the Kentucky River on an irregular basis since 1835 and down the Big Sandy River as early as 1840.²⁸ Early shipments on the Big Sandy consisted of rafts and barges of poplar logs used to transport coal to Cattletsburg, where the barges were sold along with their cargo.²⁹ The Cumberland and Kentucky River coal trade of the 1820's likely operated in the same manner. Timbering during this period relied chiefly on Kentucky markets and was confined to areas on the periphery of the region.³⁰ This pattern persisted as long as rivers were the only means of transport. In areas near the headwaters of the major streams in Breathitt, Floyd, Harlan, Letcher, and Perry counties, forest resources were used only locally and remained virtually untapped in the late 1870's.³¹

Access to water transportation permitted logging in Clay, Johnson, Lawrence, and Pike counties during the 1870's. Timber from Clay County was marketed in the Bluegrass via the South Fork of the Kentucky River

²⁸Verhoeff, The Kentucky River Navigation, op. cit., p. 190.

²⁹Henry P. Scalf, Kentucky's Last Frontier (Prestonburg, Kentucky: Henry P. Scalf, 1966), p. 213.

³⁰Verhoeff, The Kentucky River Navigation, op. cit., p. 192.

³¹Kentucky Bureau of Agriculture, 1878, op. cit., pp. 273, 349, 387, 444, 469, and 540.

and the Kentucky River (Figure III-3).³² The Big Sandy and Tug Fork Rivers connected Lawrence and Pike counties with the Ohio River, where shipments continued downstream to Cincinnati.³³ Tanbark, used at leather tanneries in Carter County and Cincinnati, was also rafted down the Big Sandy from Johnson County.³⁴

Elsewhere, logging and sawmilling were dramatically stimulated by the expansion of railroads (Figure III-4). The impact of rail service was reflected in the 1870 census returns for Rockcastle and Pulaski counties. Rockcastle County, served by the Louisville, Nashville and Great Southern Railway, had ten sawmills operating, five of which were located on the railroad at Brodhead, and reported products valued at \$45,645. The mills at Brodhead required 38 full-time hands in operating eight months of the year. Six mills operated in neighboring Pulaski County where no railroads existed and only \$18,100 of lumber were produced. These ran for just three to four months in 1870 and generally employed only four or five laborers.³⁵ The Pulaski County total increased to just over \$116,000 in 1880 after the Cincinnati Southern Railway was completed.³⁶ Williamsburg, in Whitley County, also became an important center after the Louisville and Nashville Railroad was extended from Rockcastle County in the early

³²Verhoeff, The Kentucky River Navigation, op. cit., pp. 108-114.

³³Chapman, op. cit., pp. 105-108; Kentucky Bureau of Agriculture, 1878, op. cit., pp. 437 and 543.

³⁴Kentucky Bureau of Agriculture, 1878, op. cit., p. 420.

³⁵U.S. Bureau of the Census, Manuscript Census of Manufactures, 1870.

³⁶U. S. Bureau of the Census, Census of Manufactures, 1880.

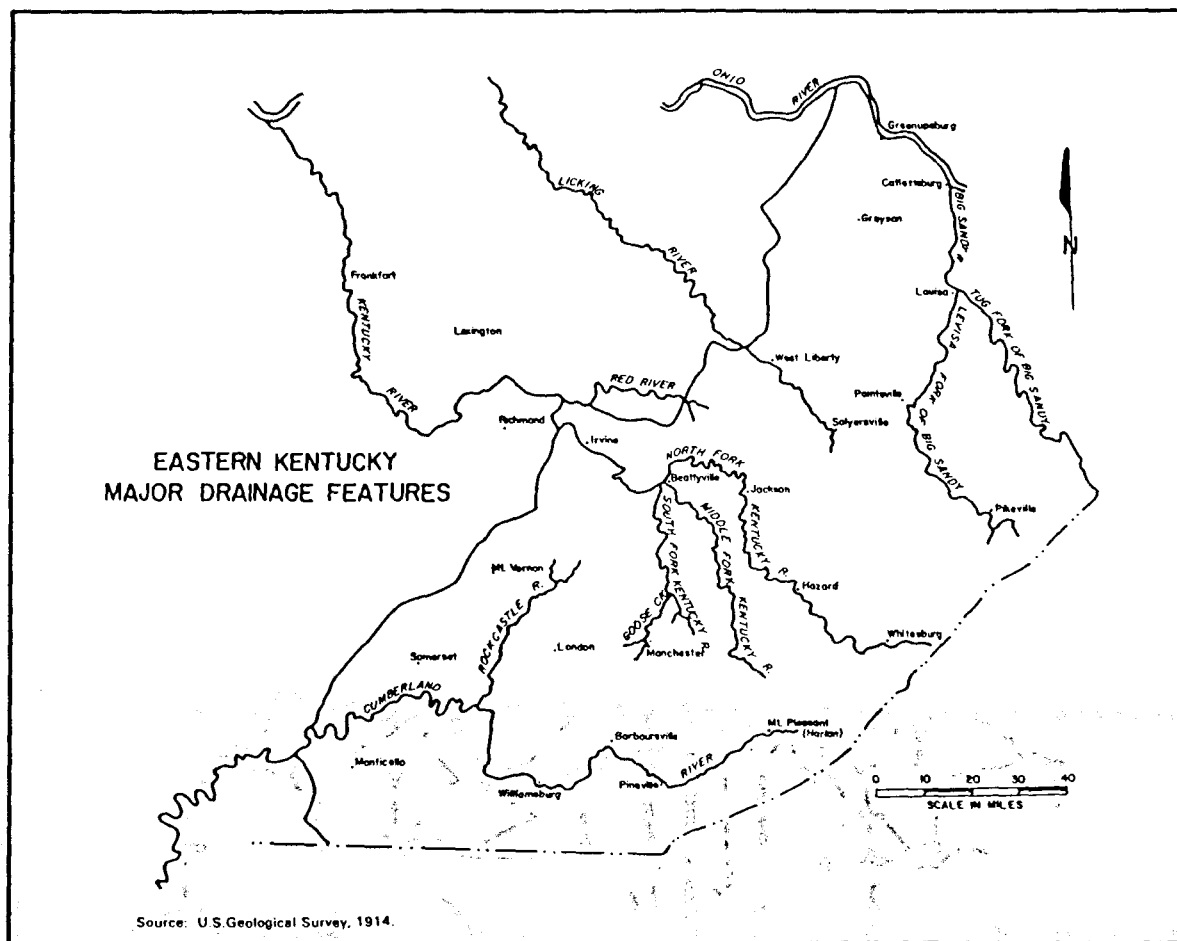
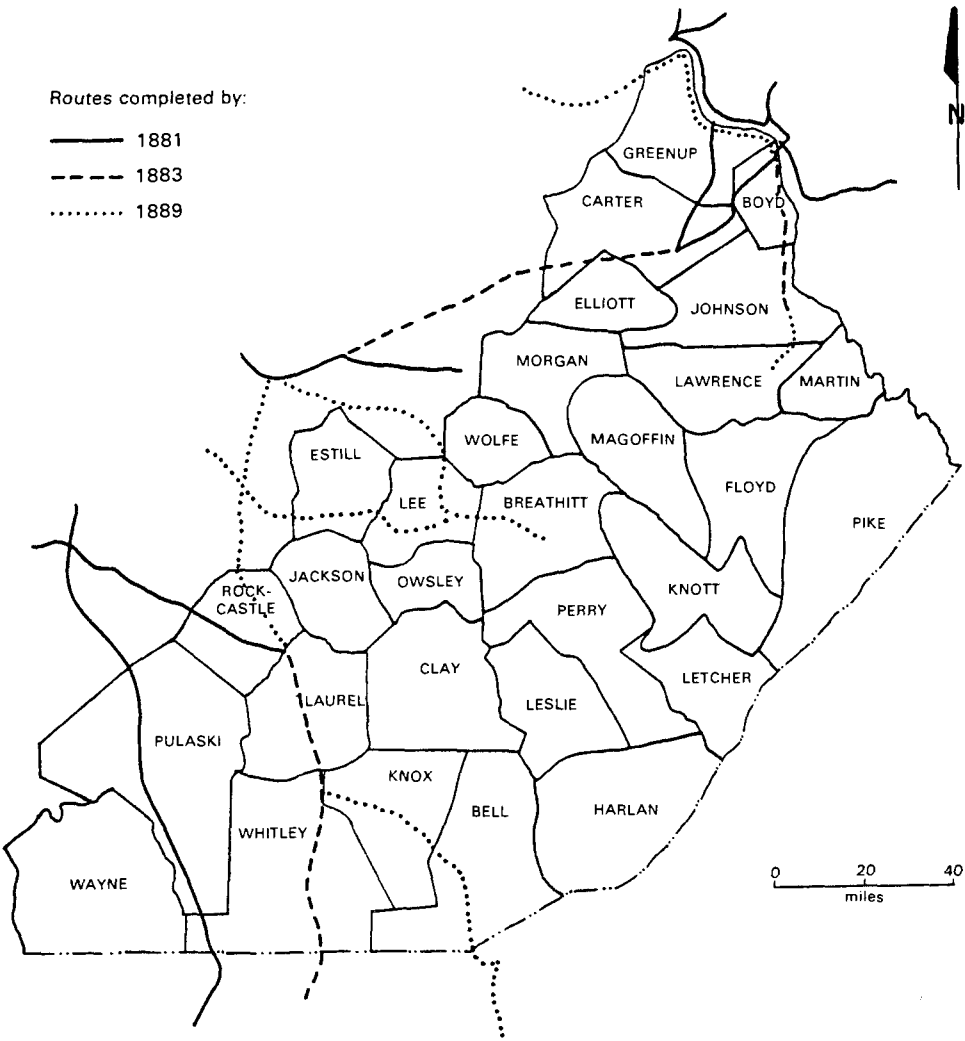


Figure III-3. Eastern Kentucky Major Drainage Features.

RAILWAY EXPANSION, 1881-1889



Sources: W.H.Gamble, *Maps of Kentucky and Tennessee*, 1881 and 1883;
Rand McNally, *County and Railroad Map*, 1889.

Figure III-4. Railway Expansion, 1881-1889.

1880's. Williamsburg's mills provided an outlet for local timber as well as for logs floated down the Cumberland River from Bell County.³⁷

Forestry also was important as a supplement to farming. The 1880 agricultural returns for Bell, Clay, Pike, Pulaski, Rockcastle, and Wolfe counties each showed forest products valued at more than \$30,000.³⁸ Until after 1890, when railway penetration of the most heavily timbered areas became widespread, most of the production was conducted by farmers on their own woodlots.³⁹ This piecemeal approach did remove some of the region's most valuable timber, especially high-grade poplar, but real commercial significance of the industry was not attained until the turn of the century.

Coal Mining

In addition to previously developed areas near water transportation, coal production now occurred at places served by an emerging railway system (Figure III-4). Boyd, Carter, and Greenup counties not only had rail facilities but, were in proximity to local markets provided by iron manufacturing in Boyd County. Collectively, the three counties accounted for 88,000 of the region's 119,000 tons mined in 1870, with 29,000 tons being consumed at iron works in the Hanging Rock District.⁴⁰ Three furnaces regularly

³⁷ Kentucky Bureau of Agriculture, 1887, op. cit., p. 123.

³⁸ U.S. Bureau of the Census, Census of Agriculture, 1880.

³⁹ Verhoeff, The Kentucky River Navigation, op. cit., p. 187.

⁴⁰ Currens and Smith, op. cit., pp. 26-27; Kentucky Geological Survey, 1884, op. cit., p. 193.

used stone coal for smelting, consuming 180,065 tons from 1870 through 1874.⁴¹ Their operation represented the only substantial regional consumption of coal through the 1870's and after. The balance of the coal mined in this northern part of the region found outside markets down the Ohio River at Cincinnati and smaller towns.

By 1880, the output of the region's mines had more than quadrupled (487,820 tons) in response to improved rail connections, continued industrialization in northeastern Kentucky, and increased demands in central Kentucky. Shipments down the Kentucky River system to the Bluegrass from Lee County, and down the Cumberland River to Nashville from Pulaski County, continued as they had in the 1830's (Figure III-5).⁴² Over half of the total production, however, came from areas with railway access. The northern-most counties remained dominant, supplying Ashland's iron and steel mills and newly established brickyards,⁴³ plus the Ohio River Valley to Cincinnati. A second railway oriented area occurred in the southwest, where mines in Rockcastle and Pulaski counties were now able to tap home heating markets in small towns in central Kentucky and Middle Tennessee. Employment in mining remained moderate. Mines in the three northern

⁴¹Kentucky Geological Survey, 1884, op. cit., p. 193.

⁴²U.S. Bureau of the Census, 1880, Vol. XV, Mineral Industries.

⁴³U.S. Bureau of the Census, Manuscript Census of Manufactures, 1880.

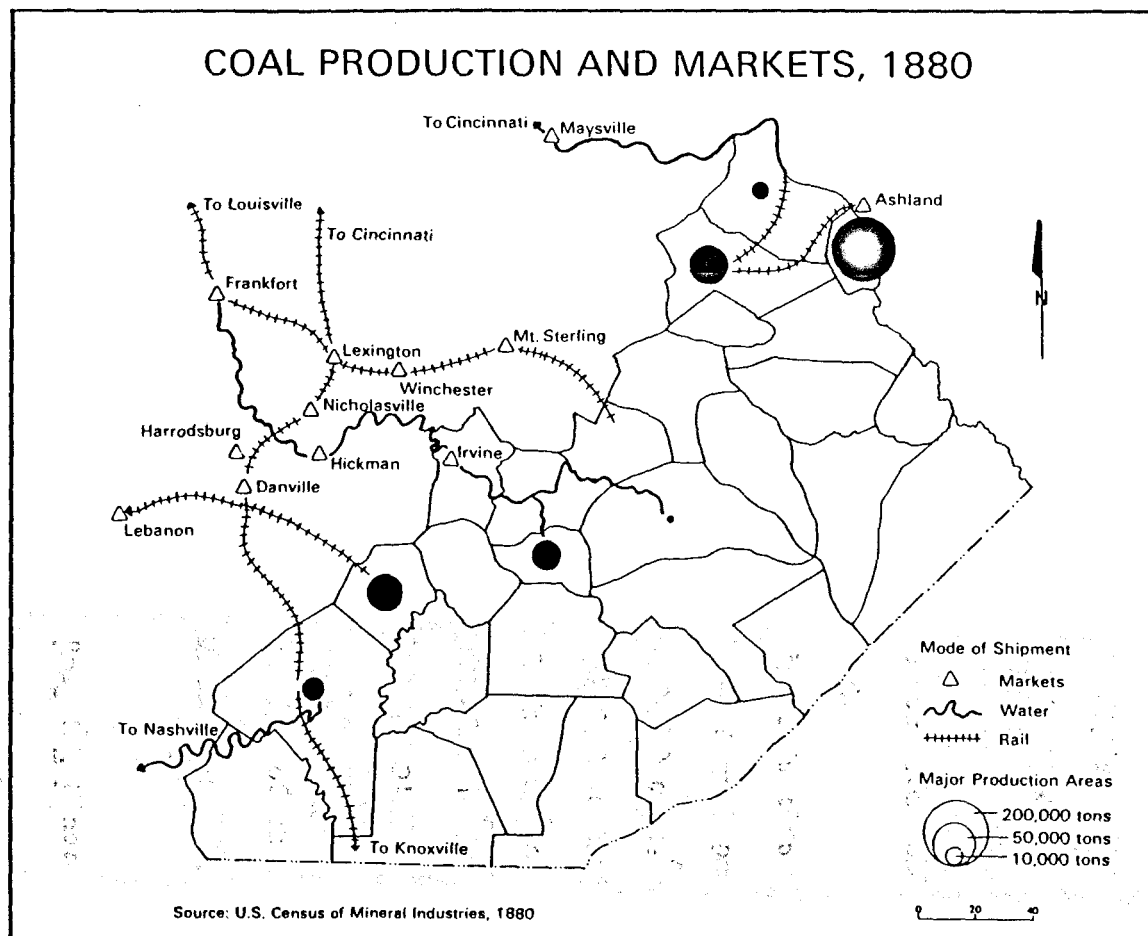


Figure III-5. Coal Production and Markets, 1880.

counties provided 534 jobs; 356 were employed in Pulaski and Rockcastle counties; and only 100 were involved in Lee County's coal production.⁴⁴

Railway extensions clearly held the key to future developments, and the expanded commercial mines came under state inspection in 1884. C. J. Norwood, the State Inspector of Mines, viewed the completion of the Chesapeake, Ohio, and Southwestern from Boyd and Lawrence counties to Cincinnati, and the extension of the Cincinnati Southern to Knoxville, as a landmark in the mining interests of eastern Kentucky.⁴⁵ Not only were markets in the Midwest and South now accessible, but access to extensive coal deposits had been obtained.

Especially significant to the region's production was the opening of mines in Laurel and Pulaski counties. Annual production in these areas began to consistently exceed 200,000 tons,⁴⁶ indicating that intensive operations had become established in the southern part of the region. In 1884 Laurel county's 15 mines employed 551 persons, and the six mines in Pulaski County provided 694 jobs.⁴⁷ Neither of these two previously had more than 130 mining employees. Pulaski's total slipped to 286 in 1889, but Laurel increased to 817, producing coal valued at \$251,000. At the same time extension of the Knoxville Branch of the Louisville and Nashville Railroad made it possible to open mines

⁴⁴U.S. Bureau of the Census, 1880, Vol. XV, Mineral Industries.

⁴⁵Kentucky Inspector of Mines, First and Second Annual Reports for the Years 1884-1885 (Frankfort: John D. Wood, Public Printer, 1885), pp. 14-15.

⁴⁶Currens and Smith, op. cit., pp. 28, 30.

⁴⁷Kentucky Inspector of Mines, 1884, op. cit., p. 6.

in Whitley County employing 575 people. In the north, Boyd County's employment in coal had decreased, but mine employment in Carter County had increased to 448, more than four times the figure for 1880.⁴⁸

These concentrations were exceptional, however. Over the region commercial mining employment amounted to only 2,871.⁴⁹ The real potential of the region's coal resources was yet to be realized. One expression of the extent to which coal deposits were underdeveloped was the widespread occurrence of local mines and neighborhood "banks," which were worked by farmers in the off season. Over 1,300 local mines were reported in 1889,⁵⁰ usually in locations where railroads had not promoted commercial mining (Figure III-6). The value of products sold at these local mines varied dramatically from \$7.71 per mine in Breathitt County and \$10.38 in Harlan County to \$446.16 in Wolfe County.⁵¹ The volume of production from such operations was low. Local mines in Breathitt County, for example, only produced an average of 8.4 tons in 1889.⁵² In common practice, the coal was dug by farmers

⁴⁸U.S. Bureau of the Census, 1890, Mineral Industries, op. cit., p. 383.

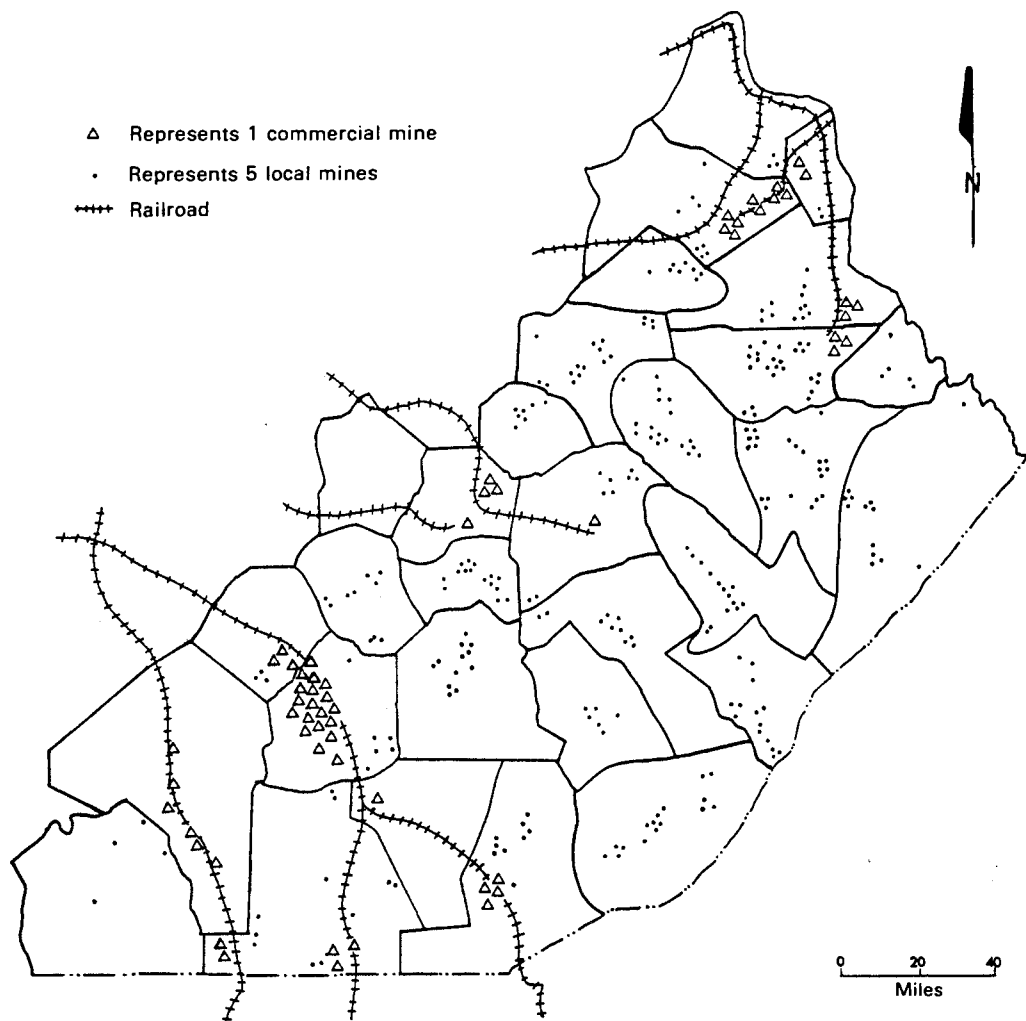
⁴⁹Ibid.

⁵⁰Ibid., p. 382.

⁵¹Ibid., p. 383.

⁵²Ibid.

DISTRIBUTION OF MINES, 1889



Source: Kentucky Inspector of Mines Annual Report, 1889.

Figure III-6. Distribution of Mines, 1889.

as an off-season supplement to agricultural income and was often sold only when a neighbor's request created a demand.⁵³ As unsophisticated as these mining efforts were, they did represent a source of income outside agriculture which must have been important on a family or individual scale. It also seems to refute the sometimes popular view that the mountaineer was generally ignorant of the mineral resources beneath his farmland. Perhaps more importantly, the contrast in production between local and commercial mines illustrated clearly just how vitally the fortunes of mining were linked with railway development.

Other Influences of Railway Expansion

Aside from its influence on mining and timbering, railway development, especially the anticipation of routes, brought about significant changes in land ownership when speculators were attracted to eastern Kentucky. Conspicuous by the vast acreages they acquired, the activity of three firms delineated major areas of future resource development. William H. DeGroot (an agent for a New York City firm),⁵⁴ E. C. Morgan, and Smith and Baum, acting in a similar capacity, were busily involved in land deals during the 1870's. From surveys made between March 3 and April 14, 1870, DeGroot and his associates purchased 73,800 acres in Clay County, 87,000 acres in Perry County, and 19,400 acres

⁵³ Jean Thomas, Big Sandy (New York: Henry Holt and Co., 1940), pp. 117-120.

⁵⁴ City Directory, New York City, 1870.

in Bell County. From August 19, 1871, to January 3, 1872, Smith and Baum had surveyed 120,800 acres for acquisition in Letcher County. Surveys for Morgan's transactions were conducted between July 4, 1872, and May 25, 1874, and included 254,000 acres in Perry County, plus 25,800 acres in Letcher County.⁵⁵ The North Fork of the Kentucky River was identified as the primary watercourse related to most of the Perry County tracts. This valley ultimately became the route taken by the Chesapeake and Ohio Railroad when it reached the massive Hazard and Elkhorn coalfields. Ironically, this land speculation preceded the opening of the coalfields by nearly four decades. In the interim, land use change was not apparent.

The speculation was well-timed, though, with respect to prices that timber and coal-bearing tracts would later bring. In 1887, anticipation of the Louisville and Nashville route through Bell County had pushed the 1870 value of \$.50-\$1.00 per acre to \$10.00-\$50.00 per acre. In spite of inflated prices, the area still appealed to outside capitalists as evidenced by an English syndicate's purchase of nearly 100,000 acres at \$15.00 per acre in Bell County.⁵⁶

One of the most dramatic examples of the influence of railway expansion and the interplay between outside investors and resource development as agents of change occurred at Middlesboro in Bell

⁵⁵Willard R. Jillson, The Kentucky Land Grants, Part 2 (Baltimore: Genealogical Publishing Co., Inc., 1971), pp. 1175-1187; 1500-1510; 1714-1722.

⁵⁶Kentucky Bureau of Agriculture, op. cit., 1887, p. 126.

County after railway completion in 1889. The town was only a year old at that time and had just fifty inhabitants. By August 1890 the town's population swelled to 6,200. Numerous mines opened in the area, vacant lots became factory sites, and the locally important deposits of coking coal and iron ore gave rise to an iron and steel industry.⁵⁷ Land prices spiralled -- building frontages which previously had been worth little suddenly sold as high as \$400 a foot.⁵⁸ As was characteristic with other development of the area's resources, capital had come from outside Kentucky -- in this case from England. The boom was short-lived. English investors disappeared with banking failures at home, and the Panic of 1893 worsened the situation to the point that factories closed, and the people left by the hundreds.⁵⁹ Middlesboro's rapid emergence as a population center based on resources and outside capital served as an early model of development for twentieth century mining towns in the area. The role of outside investment was especially critical in this period because the emergence of absentee, rather than local ownership would later have serious repercussions for the region and its development.

Agriculture

Significant gains in the value of agricultural products occurred by 1890 (Figure III-7). Only Boyd County, which had 121 fewer farms

⁵⁷ Bowman and Haynes, op. cit., p. 55.

⁵⁸ Willard R. Jillson, The Coal Industry in Kentucky (Frankfort: The State Journal Company, 1922), p. 59.

⁵⁹ Bowman and Haynes, op. cit., p. 55 and Eller, op. cit., pp. 81-85.

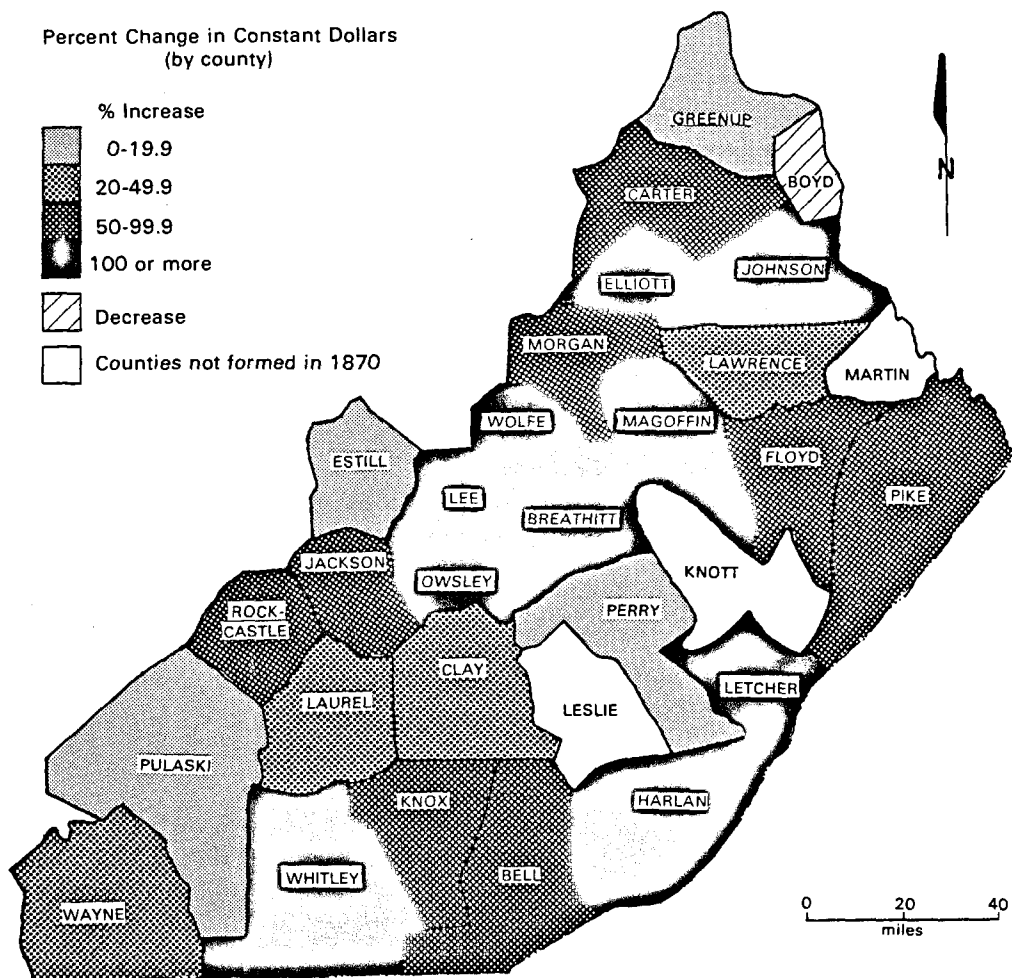
CHANGE IN VALUE LIVESTOCK AND AGRICULTURAL PRODUCTS, 1870-1890

Percent Change in Constant Dollars
(by county)

% Increase
 0-19.9
 20-49.9
 50-99.9
 100 or more

Decrease

Counties not formed in 1870



Source: U.S. Bureau of the Census, 1870, 1890.

Figure III-7. Change in Value Livestock and
Agricultural Products, 1870-1890.

in 1890 than in 1870, showed a decrease in the value of agricultural products.⁶⁰ Expanding urbanization with industrial employment in Ashland and Cattletsburg had increasingly become an alternative to farming. Moderate gains also occurred in Greenup and Estill counties where local agricultural markets had been lost when the iron industries closed. Similarly, a slight percentage characterized well-developed Pulaski County. The lowest percentage change occurred in Perry County and can be attributed to the area lost in the formation of adjacent Leslie and Knott counties during the 1880's.⁶¹

Notable development occurred over the remainder of the region, especially in the central part and in the southeast, which had been more thinly occupied in previous decades. With some exception the areas of high relative increase correlate with railway expansion (Figure III-4). Although railroads generally had little direct impact on agriculture,⁶² the possibility of marketing some livestock or forest products at railheads might have stimulated the agricultural economy in those areas.

For most of the region, increased productivity seems to have come about through an expansion in the number of farms and farmland, rather than improved agricultural practices. Much of the expansion probably

⁶⁰U.S. Bureau of the Census, Census of Agriculture, 1870, p. 353; and 1890, pp. 210-211.

⁶¹Wendell H. Rone, Sr., An Historical Atlas of Kentucky (Evansville: Burkert-Walton, Inc., 1965), pp. E-20-E-21.

⁶²Davis, op. cit., p. 114.

consisted of subdivision of larger farms within families. More than 800 new farms were created in each of the following counties: Knox, Laurel, Lawrence, Morgan, Pike, and Whitley. Regionally, 16,125 farms were added in a pattern similar to that of major increases in agricultural values.⁶³ Corn remained the region's dominant crop, occupying an average of better than thirty percent of the improved farmland in each county.⁶⁴ Swine, so dominant in earlier years, were now nearly equalled by cattle in Carter, Lawrence, Laurel, Morgan, Pulaski, Pike and Whitley counties.⁶⁵ Sheep were also becoming more numerous, particularly in the western border counties. The increased emphasis on livestock suggests that the region's farmers were making an effort toward commercial agriculture instead of relying on subsistence. Given the problems of marketing other products, livestock were the chief source of revenue for many of the region's farms.⁶⁶

Eastern Kentucky's agricultural potential was limited, and crop yields were correspondingly below those elsewhere in the state. Corn yields of 24.6 bushels per acre in Greenup County were the highest in the area, but amounted to two bushels less than the average county yield in the state. Yields of less than twenty bushels per acre were realized in more mountainous counties. Even in Pulaski County, where

⁶³U.S. Bureau of the Census, Census of Agriculture, 1890, pp. 210-211.

⁶⁴Ibid.

⁶⁵Ibid.

⁶⁶Kentucky Bureau of Agriculture, 1887, op. cit., p. 227.

agriculture was relatively well-developed, the average corn yield was only 16.7 bushels.⁶⁷ Davis pointed out that by 1890 population pressure, primarily from natural increase, had forced the occupation of exceedingly rough country in the Upper Cumberland and Kentucky River basins.⁶⁸ Expansion into these areas of steep slopes and easily eroded soils meant agriculture could be only marginal in productivity.

In addition to problems of the physical environment, the practices and attitudes of the farmers themselves received critical comment during this period. In a commentary included in the 1887 Bureau of Agriculture Report, an observer of the Lower Big Sandy Valley suggested that the area's " . . . farming interests can be bettered only by the introduction of foreign citizens who know better than our native population, how the land should be cultivated."⁶⁹ In fairness to the native population, it should be pointed out that foreign agriculturalists fared no better. Agricultural colonies were established by Swiss immigrants in Laurel County between 1880 and 1890, with the intention of producing wine, garden products, and cheese. None of these were successful; the colonists either left or found employment in the coal mines.⁷⁰ At the same time, an insider viewed Wolfe County

⁶⁷U.S. Bureau of the Census, Census of Agriculture, 1890, pp. 367-368.

⁶⁸Davis, op. cit., p. 53.

⁶⁹Kentucky Bureau of Agriculture, 1887, op. cit., p. 107.

⁷⁰Verhoeff, The Kentucky Mountains, op. cit., p. 28.

as a poverty area because of " . . . the failure (of the people) to work a reasonable portion of the whole year."⁷¹ However exceptional or representative the critical assessments of the native farmers may have been, and although the region's agriculture did lag behind the rest of the state, agricultural production increased in spite of isolation and rugged terrain.

At the regional scale, considerable variation in crop and livestock selections occurred from place to place as illustrated in 1880 manuscript census returns from two border counties (Pulaski and Greenup) and two mountain counties (Breathitt and Pike) (Table III-1). The value of agricultural products was lowest for the Pike County farm, which apparently had the least access to markets, and highest in Greenup County near Ashland, the region's only urban market. A greater diversity of crops was raised in the two border areas in contrast to the marked emphasis on corn in the mountain counties. Although diversification might suggest a more well developed farming practice, it could simply have been a product of differences in the amount of improved acreage. The number of livestock raised in the Pulaski County example is a reflection of the greater carrying capacity that would be expected in the less mountainous area. The emphasis on hogs, poultry, and butter in the two border counties might also be related to marketing possibilities. Forest products were decidedly more important to the Pike County farmer, and the amount cut seems indicative of the more

⁷¹Kentucky Bureau of Agriculture, 1887, op. cit., p. 228.

TABLE III-1

INDIVIDUAL FARMING OPERATIONS, 1880

	Breathitt	Greenup	Pike	Pulaski
Improved Acreage	30	60	25	60
Unimproved Acreage	150	--	150	100
Value of Products	\$200	\$300	\$125	\$125
Value of Livestock	\$200	\$275	\$170	\$200
Livestock:				
Horses	3	1	1	2
Mules	-	1	-	-
Oxen	-	-	2	-
Milk Cows	2	2	1	3
Other Cattle	2	4	3	4
Sheep	14	-	6	21
Swine	7	8	3	24
Poultry	25	60	18	28
Crop:				
Corn	25 acres 500 bu	15 acres 400 bu	15 acres 200 bu	14 acres 150 bu
Wheat	--	4 acres 40 bu	--	6 acres 35 bu
Oats	--	8 acres 80 bu	--	7 acres 35 bu
Beans	1 bushel	2 bushels	4 bushels	1 bushel
Potatoes	31 bushels	--	10 bushels	18 bushels
Sorghum	1 a, 30 gal molasses	1 a, 90 gal molasses	3/4 a, 33 gal molasses	3/4 a, 70 gal molasses
Orchard Crops	25 peach trees	4 apple trees	--	30 apple trees
Products:				
Butter	50 pounds	100 pounds	50 pounds	100 pounds
Eggs	12 dozen	100 dozen	12 dozen	18 dozen
Forest Products:	10 cords wood	--	15 cords wood	50 cords wood
Value	\$2	--	\$150	\$5

Source: Manuscript Census of Agriculture, 1880 Returns for Hensley Haddix Farm, Breathitt County; James Burton Farm, Greenup County; William T. Scott Farm, Pike County and James Thompson Farm, Pulaski County.

valuable stands of timber found in that part of the region. The activity in forestry there could also explain the keeping of oxen, which were often used for logging in rough terrain. The farming operations were, of course, a product of individual decisions, but also carried with them geographic differences in the region's agricultural potential.

Subregional Analysis of Economic Change, 1870-1890

The sum of changing market patterns produced by outside competition, the development of previously unexploited resources, and the expansion of railways had varied expression over the region. The major element of change in the Northeastern Subregion consisted of a shift from a resource base focused on iron manufacturing to one based on coal mining. Relative to other areas, the subregion continued to be economically advanced. Greenup County, which lacked the coal resources of Carter County and the industrial growth of Boyd County, failed to keep pace with the neighboring counties, but the infrastructure created by earlier iron making activities helped to retain a regionally exceptional level of economic development. Carter County had begun to rely slightly less on agriculture as mining became more important. As in 1870, Boyd County enjoyed the greatest industrial diversity. In 1887 the Norton Iron Works employed 1,000; 800 more were employed by the Ashland Coal and Iron Company; and an additional 370 found jobs in brick factories, furniture factories, and railways. With a population of 5,000 Ashland was the region's only significant urban center.⁷²

⁷²Kentucky Bureau of Agriculture, 1887, op. cit., p. 126.

By contrast Estill County, identified as a subregion in 1870, had declined dramatically with the passing of the iron industry. Manufacturing employment in 1890 totalled only 35, a remarkable drop from the 425 who had previously worked in iron making.⁷³ In the absence of the iron industry, grist milling and sawmilling remained as typical businesses. No coal was mined, and the earlier removal of forest resources for charcoal left agriculture as the county's chief economic base.

The Southwestern Subregion experienced a mix between stability in agriculture and an increase in manufacturing and mining in Pulaski County. The subregion's most significant change had occurred with the rapid rise of mining in Laurel County during the 1880's. Rockcastle County had come to rely more on agriculture than in the past. Characteristics of manufacturing in the subregion had changed less than elsewhere, with agricultural processing at grist mills and tanneries accompanied by sawmilling and blacksmithing as typical non-agricultural sources of income.⁷⁴

Except for the extension of coal mining into Lawrence, Whitley, and Bell counties, and the brief industrialization at Middlesboro, expanded farming activities had brought the greatest change in the Mountain Subregion. Railways had not yet significantly changed the agrarian character of most of the counties. Grist mills and sawmills

⁷³U.S. Bureau of the Census, Census of Manufactures, 1890, pp. 431, 433.

⁷⁴U.S. Bureau of the Census, Manuscript Census of Manufactures, 1880.

remained the typical industrial enterprise, but had become more numerous with expansion in the agricultural sector. Livestock showed significant increases in the Mountain Subregion and specialized activities had developed in response to the needs of the local population.

Relative Value of Economic Activities, 1890

Where available, the dollar value of agriculture, manufacturing, and mining was totalled by county to provide an indication of each in the regional economy (Table III-2). These figures are not wholly comparable to similar computations after 1870 because the value of home manufactures, unreported by the Census after 1870, was replaced by the value of coal mined in 1889. The total value appearing for counties here is also underrepresented because the inputs of retailing and forestry were not available from the census of 1890. Only partial totals exist for eight counties where manufacturing values were not reported separately. These counties were grouped with one county outside the study area and the collective sum amounted to \$82,730.⁷⁵

On a regional scale the economy was heavily oriented to agriculture. In most of the mountain counties, this sector accounted for over 90 percent of the economic output. Manufacturing was significant in each of the counties in the Northeastern Subregion and in Bell, Knox, and Whitley counties. The greatest balance among the three inputs occurred in Carter, Laurel and Whitley counties. In each case coal mining existed as an important sector of the local

⁷⁵U.S. Bureau of the Census, 1890, Census of Manufactures, p. 433.

TABLE III-2

VALUE OF ECONOMIC ACTIVITY BY COUNTY, 1890.

County	Total Value (dollars to nearest thousand)	Percent of total value contributed by:		
		Agriculture	Manufacturing	Mining
Bell	470	56.0	38.0	6.0
Boyd	2473	10.7	82.0	7.3
Breathitt	513	99.1	.8	.1
Carter	1038	66.8	14.3	18.9
Clay	662	96.0	3.0	1.0
Elliott	528	95.3	4.5	.2
Estill	661	94.1	5.9	None Reported
Floyd	608	99.6	None Reported	.4
Greenup	797	75.1	24.2	.1
Harlan	387	97.0	2.7	.3
Jackson	473	98.1	1.8	.1
Johnson	570	89.3	.1	9.6
Knott ^a	288			
Knox	731	84.5	15.5	None Reported
Laurel	1016	66.3	9.0	24.7
Lawrence ^a	845			
Lee ^a	228			
Leslie	259	99.5	None Reported	.5
Letcher ^a	397			
Magoffin ^a	520			
Martin ^a	169			
Morgan	872	95.9	None Reported	.1
Owsley	549			
Perry	348	99.9	None Reported	.1
Pike	952	96.9	2.9	.2
Pulaski	1842	75.1	18.9	6.0
Rockcastle	570	92.2	7.4	.4
Wayne	885	96.3	3.5	.2
Whitley	1242	68.0	15.6	16.4
Wolfe	574	92.9	5.3	2.5

^aTotals for these counties reflect the input of agriculture and mining only. Value of manufactures was reported collectively with one county outside the region.

Source: Compiled from U.S. Bureau of the Census, 1890, Censuses of Agriculture, Manufacturing, and Mineral Industries.

economy. For the entire region, coal mining employment was roughly equivalent to that in manufacturing, and the total value of coal production \$1,020,000 in 1890⁷⁶ would be exceeded by single counties in future years. The growth of coal mining in the regional economy between 1870 and 1890 served as indicative of the economic change that would take place in the coming decades. Salt and iron resources, previously complementary to coal mining, no longer were significant elements of the economy. Changes in the patterns of economic activity since 1870 occurred as subtle transitional shifts toward an accelerated rate of change to be dominated by coal mining.

A more subtle, yet critical force of change lay in speculative interest from outside the region.⁷⁷ The geographic and economic realities of the transitional period and the impacts of speculation would become increasingly apparent during the next three decades.

⁷⁶U.S. Bureau of the Census, 1890 Census of Mineral Industries, p. 383.

⁷⁷Eller, op. cit., pp. 43-44.

CHAPTER IV

COAL MINING AS AN AGENT OF CHANGE 1890-1920

Mining activities which emerged during the late 1880's in the southern part of the region intensified after 1890. Increased production was stimulated at the turn of the century by expanding markets in the southeastern United States. Branches of the Louisville and Nashville Railroad's Cumberland River Route gave access to sizable deposits in Bell, Knox, Laurel, and Whitley counties and mines in this area formed the industry's chief concentration between 1890 and 1910. In 1900, 3460 of the region's 4950 miners were employed in that part of the coalfield¹ and over half of the 2,000,000 tons of coal produced in the region were mined there² (Figure IV-1). Rail connections north to Cincinnati and Louisville and south through Knoxville provided a broad market area. The high quality of the coal added to its marketability, and coal producers were successful in securing new business on the rapidly industrializing Piedmont of the Carolinas and Georgia.³ Although substantial production continued in the north in Boyd and Carter counties, long-term exploitation had begun to deplete reserves in

¹United States Geological Survey, Mineral Resources of the United States, 1900 (Washington: U.S. Government Printing Office, 1901), p. 308.

²Currens and Smith, op. cit., pp. 37-43.

³John L. Pultz, "Mining in the Cumberland Gap Coalfield" The Engineering and Mining Journal, Vol. 83, No. 17 (April 27, 1907), p. 810.

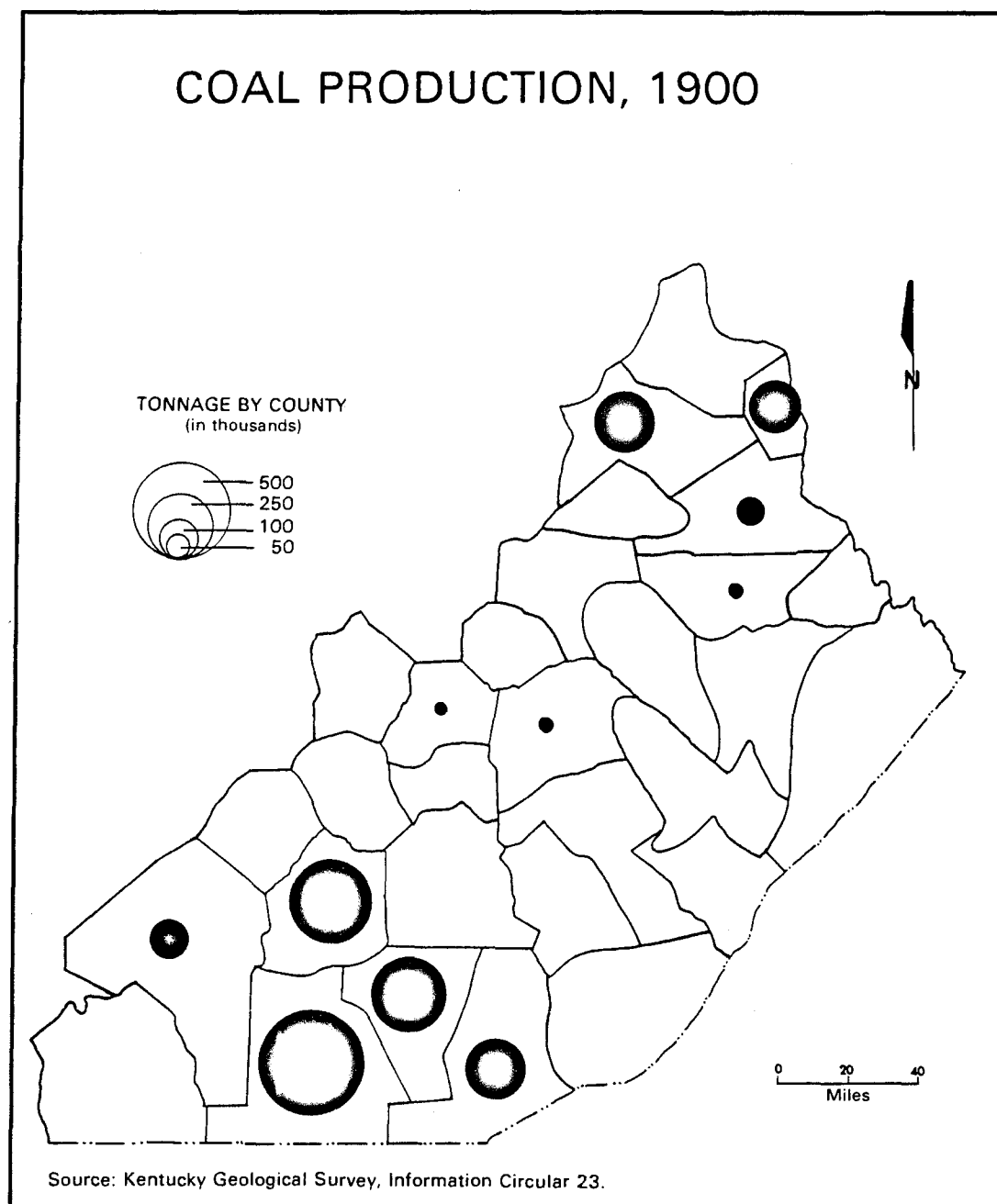


Figure IV-1. Coal Production, 1900.

that area. The output of those two counties in 1900 marked the peak of their production during the 1890-1920 period.⁴ The temporal contrast in development over the area paralleled national trends in coal mining. Prior to 1885 coal mine development had been more heavily influenced by transportation facilities than by the thickness, quality, or mining conditions of coal seams.⁵

Production increases followed railway penetration into the region's most extensive and valuable deposits. Geographical changes in the industry featured a distinct southern orientation, as illustrated in the distribution of mines in 1905 (Figure IV-2). Major elements of the pattern focused on valuable coal seams such as those in the coking and "steam" coal areas of Bell and Whitley counties. Most of the Bell County coal was made into coke, to be used either for iron production at Middlesboro, or for copper smelters at Ducktown, Tennessee.⁶ Mines in Carter, Johnson, and Morgan counties were producing "cannel" coal, which because of its bright and clean-burning qualities, brought premium prices on the domestic heating market.⁷

⁴Currens and Smith, op. cit., p. 37.

⁵Howard N. Eavenson, The First Century and a Quarter of the American Coal Industry (Pittsburgh: privately printed, 1942), p. 416.

⁶George H. Ashley, The Cumberland Gap Coal Field of Kentucky and Tennessee, U.S. Geological Survey Bulletin Number 225 (Washington: U.S. Government Printing Office, 1904), p. 275.

⁷Kentucky Inspector of Mines, Annual Reports for the Year 1905-1906 (Louisville: The Globe Printing Company, 1906), p. 33.

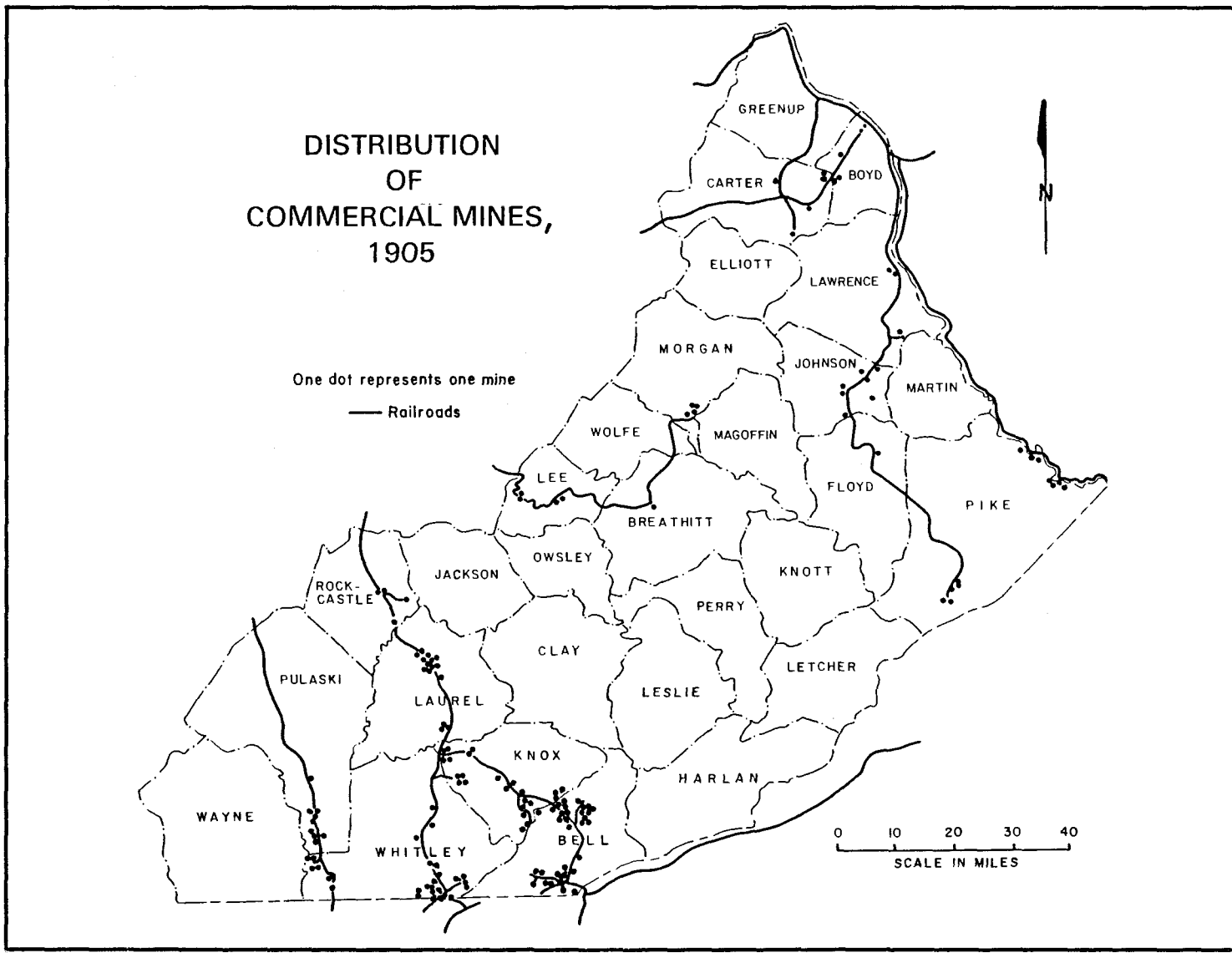


Figure IV-2. Distribution of Commercial Mines, 1905.

Most of the mines in this area were small, employing between 50 and 75 men but producing coal for varied markets. Railroads consumed the majority, followed by the iron furnaces at Ashland. Cannel coal from the mine at Torchlight, however, was shipped as far away as the Pacific Coast. In southern Pike County, mines were developing on an outlier of the high-quality Elkhorn coking coal.⁸

With railway expansion after 1905, the opening of the southeastern fields proceeded along three fronts: 1) a Louisville and Nashville route following the Kentucky River and its North Fork southeast into Perry and Letcher counties, (completed in 1912); 2) a Chesapeake and Ohio route following the Levisa Fork of the Big Sandy River south through Johnson, Floyd, and Pike counties, then west into Letcher County, (completed in 1910); and 3) the Louisville and Nashville's Cumberland Valley Route through Whitley, Bell and Harlan counties, (completed in 1911).⁹ Six different coal fields were brought into production after this railway expansion took place (Figure IV-3).

The actual development of these fields was the culmination of a lengthy process which involved a complex interplay among the region's physical geography, land speculation, intensive geologic investigation

⁸Kentucky Department of Mines, Annual Reports for the Year 1915, Part 3 (Frankfort, The State Journal Company, 1915), pp. 62-63.

⁹Bowman and Haynes, op. cit., pp. 55-57.

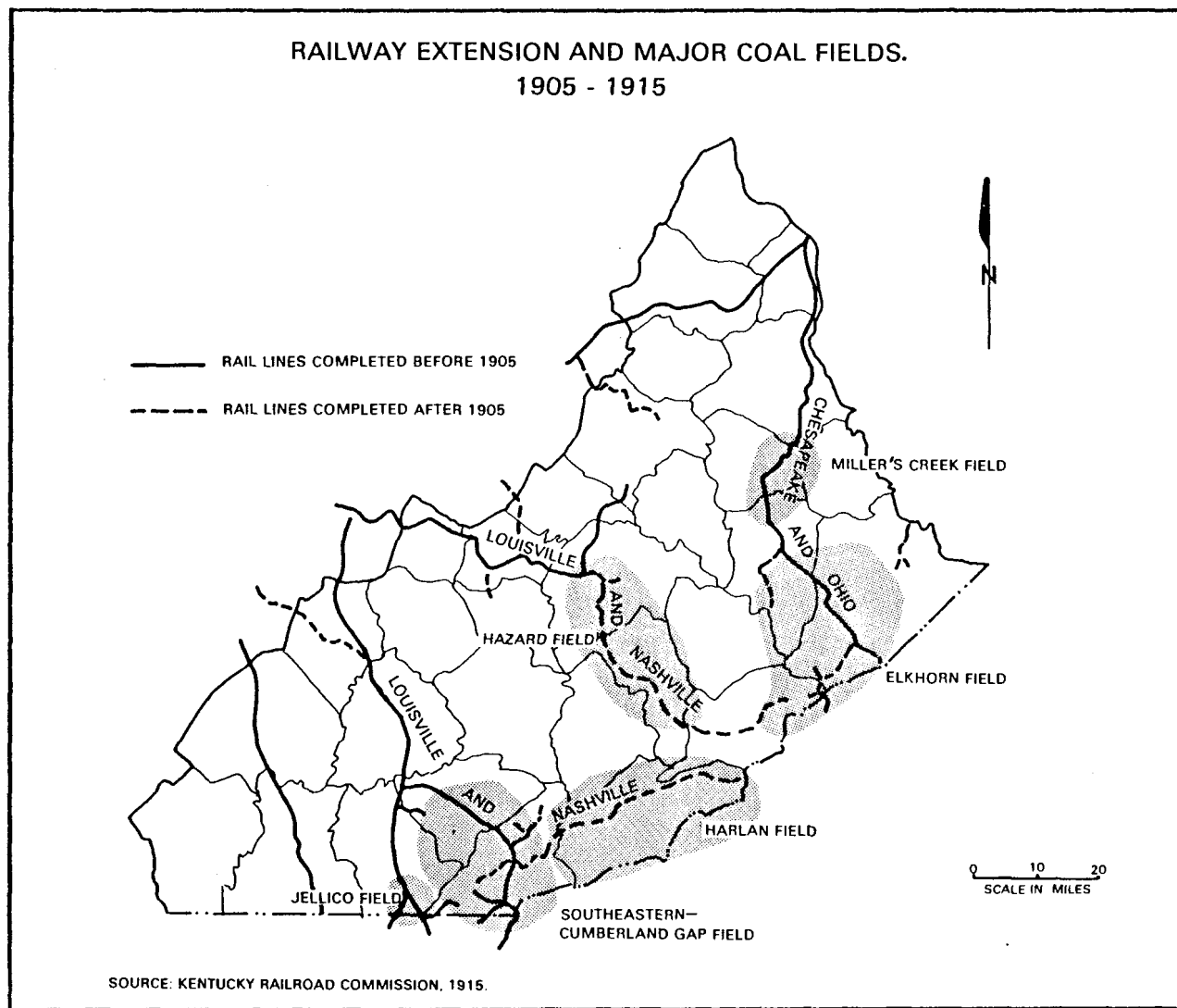


Figure IV-3. Railway Extension and Major Coal Fields, 1905-1915.

and extra-regional financial backing. Outside investment was especially significant because economic change and decision-making controls increasingly shifted from local to outside sources. Exemplary of this process were the events leading to the opening of mines in the Miller's Creek and Elkhorn fields. John C. C. Mayo, a native of Pike County, acquired mineral rights to thousands of acres during the 1880's, usually paying fifty cents to one dollar per acre.¹⁰ Rather than developing the coal, however, Mayo concentrated on selling the mineral rights to holding companies or mining firms. Relying frequently on financial support from sources in Chicago, Cincinnati, Philadelphia, and Baltimore, Mayo made deals which put together tracts sizeable enough to make long-term mining feasible. The great potential of the Miller's Creek field subsequently led to its development by the Consolidation Coal Company.¹¹ Mayo also took part in the early acquisition of mineral rights in the Elkhorn Field, although outside investors were equally important.

Investigation of the Elkhorn seam had begun in 1881 when Richard M. Broas, an engineer from New York, was commissioned by the Walbridge Firm of Toledo. Later, Broas, backed by a Massachusetts financier,

¹⁰Eller, op. cit., p. 61.

¹¹Charles E. Beachley, History of the Consolidation Coal Company, 1864-1934 (New York: Consolidation Coal, 1934), p. 55.

continued farther south, convinced that most valuable coal would be found there. After much detailed fieldwork and analysis, Broas discovered the thickest and highest quality of the Elkhorn coal in southeastern Letcher County and southwestern Pike County. Over twenty-five years later, actual mining operations proved that Broas had correctly identified the chemical uniformity deemed so critical to the coal's marketability and value. Although Broas secured mineral rights, he apparently lacked Mayo's business influence and was unable to attract railroads to the remote area. Eventually Broas sold the rights to Mayo, who was then associated with yet another holding company, the Northern Coal and Coke Company, which controlled 400,000 acres of coal lands.¹² As with the Miller's Creek rights, the Elkhorn Field was to be developed largely by the Consolidation Coal Company. Other outside firms such as United State Steel, Bethlehem Steel, and International Harvester, were to play an important role in mining southeastern Kentucky coal.

Speculators such as Broas and Mayo operated elsewhere in the region as well. By 1910 it was estimated that nearly two-thirds of the total area of Bell and Harlan counties was held by companies which leased mineral rights to coal operators.¹³ The Kentenia Land and

¹²Beachley, op. cit., pp. 55-57; Shackelford and Weinberg, op. cit., pp. 136-137; Eller, op. cit., p. 63.

¹³Kentucky Bureau of Agriculture, Ninth Biennial Report, 1910, (Frankfort: The State Journal Company, 1911), p. 167.

Mining Corporation held 90,000 acres in Harlan County alone.¹⁴ More common, however, was the separate selling of mineral rights, which in reality, often gave coal operators control of the surface as well.¹⁵ These transactions were executed through the notorious "broad form" deed, later viewed as a vehicle which gave coal companies an effective means of circumventing land ownership and thereby avoiding taxation on property that they had mined.¹⁶ This method of procuring mining rights was also to be severely criticized by writers such as Caudill on the basis that the mountaineer had little comprehension of the actual value of the mineral rights he relinquished. Early recognition of this problem is found in comments made by R. W. Stone of the U. S. Geological Survey, who cautioned in 1906 that the residents of the mountains were "wholly ignorant" of what they were selling and did not realize the areal extent of the coal or that a four-foot coal bed would yield 6,000 tons per acre.¹⁷

By 1915, a widely distributed pattern of rail routes and mines had been established over the area (Figure IV-4). The region's largest coal deposits (estimates in 1906 revealed that the Elkhorn

¹⁴ J. R. Williams, ed. Appalachian Trade Journal, Vol. 6, No. 8 (August, 1911), p. 14.

¹⁵ Kentucky Bureau of Agriculture, 1910, op. cit., pp. 44 and 169.

¹⁶ Caudill, op. cit., p. 74.

¹⁷ Ralph W. Stone, Coal Resources of the Russell Fork Basin in Kentucky and West Virginia, U.S. Geological Survey Bulletin Number 348 (Washington: U.S. Government Printing Office, 1908), p. 19.

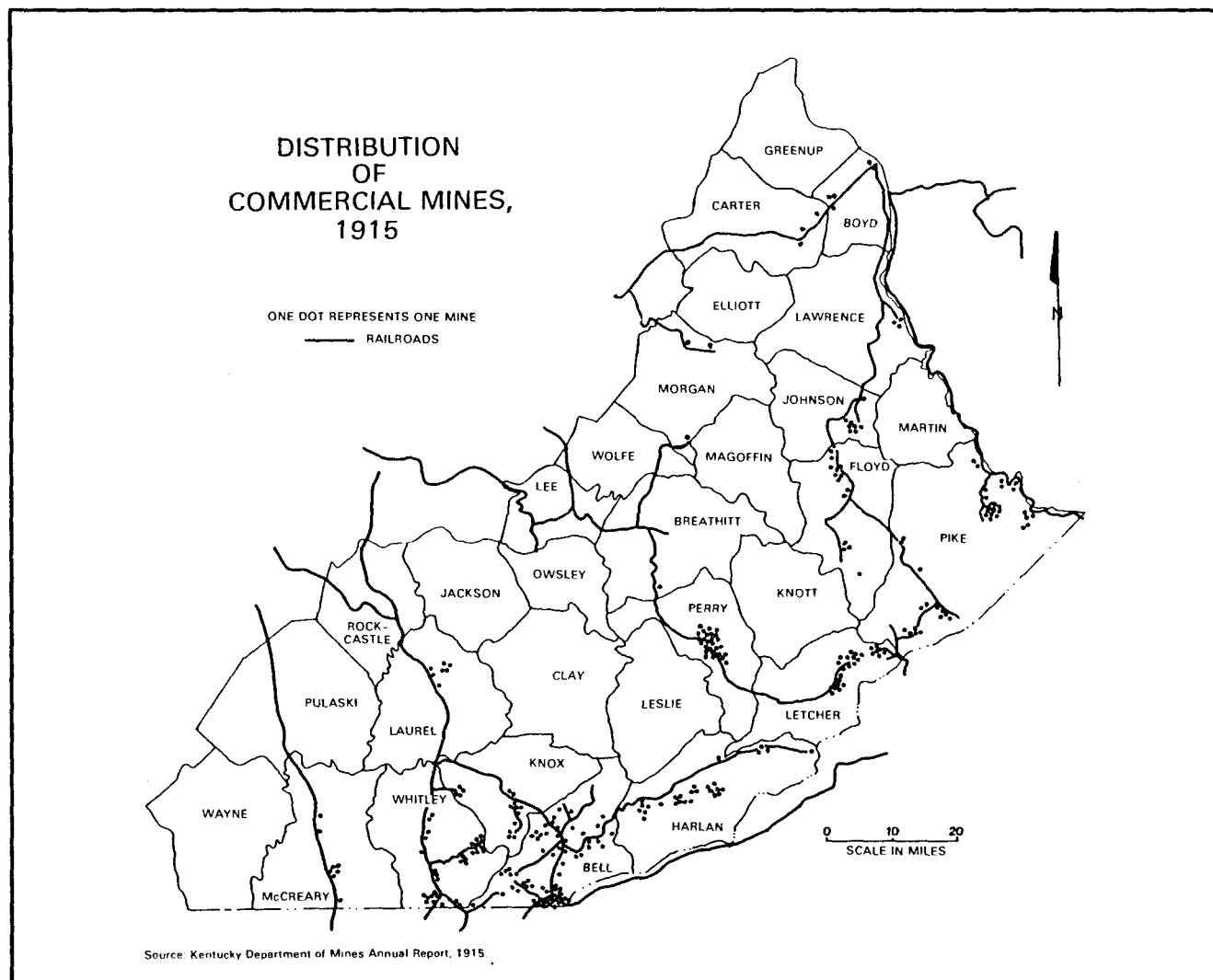


Figure IV-4. Distribution of Commercial Mines, 1915.

Field contained recoverable reserves amounting to the total state production between 1828 and 1905) had finally become commercially developed.¹⁸ Production had risen from 6,279,000 tons in 1910 to 13,690,000 tons.¹⁹ Much of the increase had come from Harlan, Perry and Letcher County mines following railway extensions in 1911 and 1912.²⁰ These developments combined with previous activity in Bell, Whitley and Pike counties to produce a markedly southern concentration in the output of mines (Figure IV-5).

The Impact of Mining on Population Patterns

Employment in mining rose rapidly after 1905 and reached 17,790 in 1915.²¹ The concentration of employment created by the mines led to changes in the distribution and character of settlement. Stream valleys had been preferred settlement sites for decades, but the dispersed pattern characteristic of agriculture was radically altered with the opening of several mines along railway spurs. In Bell County, for example, rapid development of mining in 1902 and 1903 had transformed Bennett Fork Creek into an almost continuous mining community five miles in length.²² Existing housing and services in many areas

¹⁸Currens and Smith, op. cit., pp. 19-37.

¹⁹United States Geological Survey, Mineral Resources of the United States, 1915 (Washington: U.S. Government Printing Office, 1916), p. 397.

²⁰Kentucky Dept. of Mines, 1915, op. cit., pp. 62-63.

²¹Ibid.

²²Ashley, op. cit., p. 274.

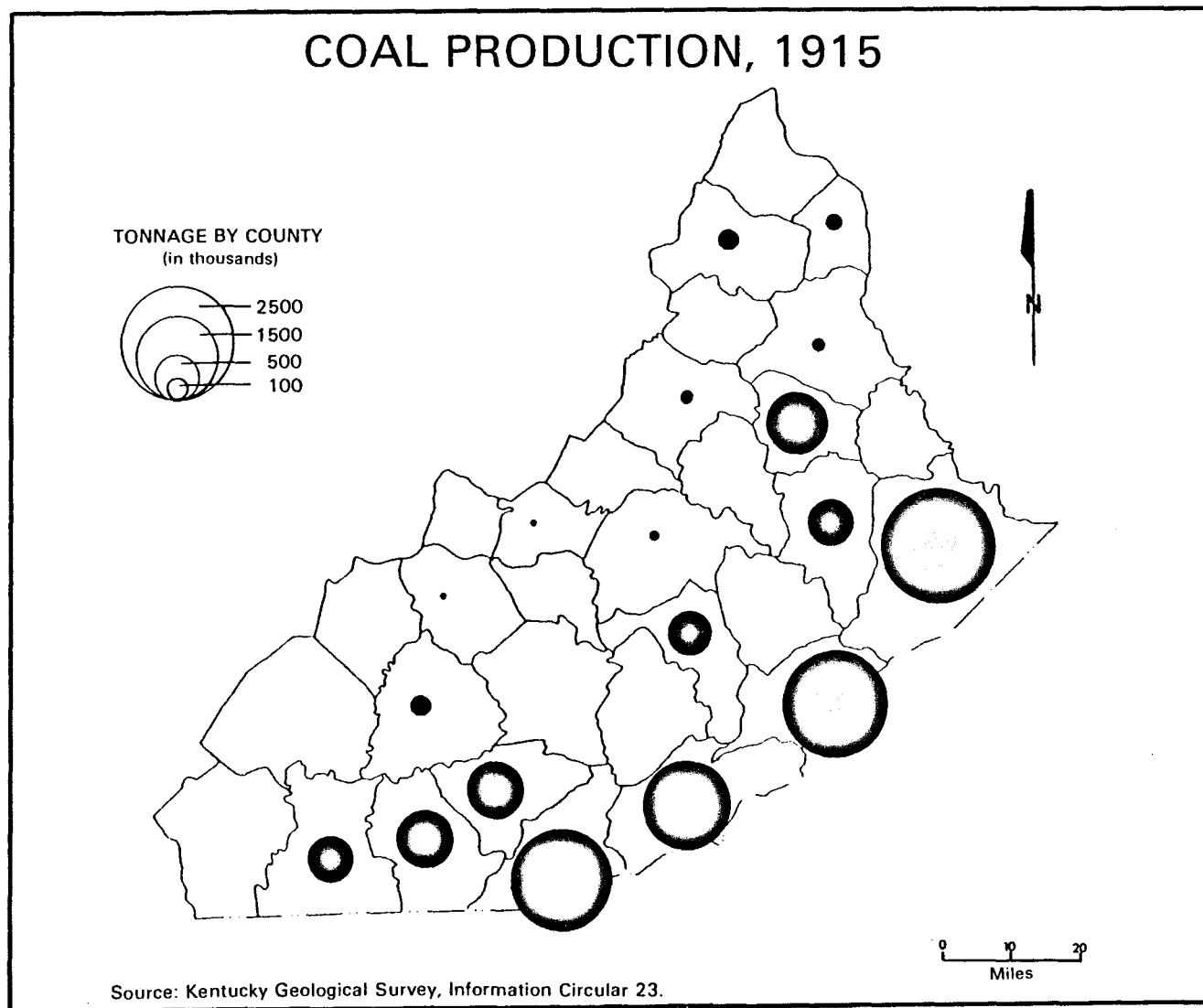


Figure IV-5. Coal Production, 1915.

where mining developed had been established in response to little more than rural demands and often the housing necessary to support a sizeable mine, or a number of mines in close proximity, was inadequate or totally absent. As a response to these circumstances, the planned, company-built town emerged as a new settlement form. Forty were built in Pike County, thirty-seven in Perry County, thirty-three in Letcher County, and twenty-five each in Bell, Floyd, Harlan, and Johnson counties.²³

Uniformity of architectural styles was common in these towns, but a considerable range of completeness, permanency, and quality occurred from place to place.²⁴ In general, the degree to which these characteristics developed was a product of the size of the coal deposit being worked and the resources of the firm doing the mining. For example, the Consolidation Coal Company entered eastern Kentucky in 1909, purchasing 30,000 acres of land in Johnson, Lawrence, and Martin counties. In the following year, they added nearly 100,000 acres in Knott, Letcher, and Pike counties.²⁵ Two of the region's largest company towns, Jenkins and McRoberts, in Letcher County, were built by Consolidation. In addition to 900 houses built at Jenkins between 1911 and 1920, the company included a bakery, an ice plant, a dairy,

²³ Caudill, op. cit., p. 106; Eller, op. cit., pp. 182-194.

²⁴ Scalf, op. cit., pp. 212-213.

²⁵ Beachley, op. cit., p. 62.

a department store, and a recreation hall. These amenities were considered necessary to support the eight mines Consolidation opened in the area. Six more were opened on the western side of the Elkhorn Field where the company built McRoberts.²⁶ Similar towns were built in Harlan County by United States Steel at Lynch and by International Harvester at Benham.²⁷ Smaller firms with substantial holdings also built carefully planned towns. In 1911, the Stearns Coal and Lumber Company at Stearns (then in Whitley County) planned to expand production at their Number 11 mine near Yamacraw. Forty new houses, a school, churches, and stores were built to accomodate 500 new miners.²⁸ Many of the coal operators had previous experience in Pennsylvania, Ohio, and West Virginia and were aware, even by the early 1900's, of the grim connotations associated with sooty, crowded mining camps. Either through pride, financial resources, or attitudes toward successful labor relations they seemed to make conscious efforts at building reasonably liveable communities.²⁹ Such towns represented long-term investments and several had populations of 2,000 or more by the 1920's,

²⁶W. B. Webb, "Development of the Jenkins-McRoberts District of Kentucky," Coal Age Vol. 6, No. 12 (September 14, 1914), pp. 456-458 and Williams, op. cit., p. 11.

²⁷W. R. Peck and R. J. Sampson, "The Harlan Coal Field of Kentucky," Coal Age, Vol. 3, No. 6 (May 14, 1913), pp. 796-800; Howard N. Eavenson, "Building a Complete Town for a Mine Population of 7000 at Lynch, Kentucky," Coal Age, Vol. 20, No. 14 (October 6, 1921), pp. 532-533.

²⁸J. R. Williams, ed. Appalachian Trade Journal Vol. 6, No. 2 (February, 1911), p. 11.

²⁹Shackelford and Weinberg, op. cit., p. 218; George H. Miller, "Plan Your Town as Carefully as Your Plant" Coal Age, Vol. 8 (May 1914), p. 130.

with Jenkins and Lynch, the two largest, reaching approximately 8,000.³⁰

At the other extreme, some company towns were but poor copies of those planned by the larger firms, and squalid conditions prevailed. Hastily built houses of unseasoned wood were relegated to sites on the slopes above the more important structures such as tipples and barns.³¹ These settlements generally were built by coal operators who entered the industry relatively late, hoping to realize profits from short-term ventures and planning their towns in strictly economic terms.³² Unfortunately, such towns were so proliferated that they came to be regarded as a stereotype of the region's mining communities.

Some county seats in coal producing counties also experienced dramatic population changes as mining expanded. Harlan's population in 1900 was 557 and increased to only 657 in 1910; by the end of the next decade its population totalled 2,647. Hazard, the seat of Perry County, grew at an even greater rate, from 537 to 4,350 people between 1910 and 1920.³³ In the summer of 1915, one of Hazard's visitors

³⁰Beachley, op. cit., p. 62.

³¹Leifur Magnusson, "Company Housing in the Bituminous Coal Fields" Monthly Labor Review, Vol. 10, (1920), p. 216.

³²Scalf, op. cit., pp. 210-213.

³³U. S. Bureau of the Census, Censuses of Population 1900, 1910, and 1920.

described the place as "a scar upon the landscape, like a 'boom' town of the west."³⁴ Five years later, another observer was similarly impressed with the "raw newness" of rapid growth.³⁵

Other county seats in active mining areas experienced only moderate rates of population growth. Trade and governmental functions had given these places stable populations during previous decades. Pineville, in Bell County, had approximately 2,000 residents in 1910 and its townscape featured macadamized streets and concrete sidewalks. Barbourville, the seat of Knox County, was similar in size and had electric lights, a water works, modern streets, and sidewalks. In Pike County, Pikeville's 1,800 residents were served by electric lights, a sewer system, and a telephone exchange.³⁶ Growth in these places had evolved comparatively slowly. Harlan and Hazard were in more immediate proximity to valuable and extensive coal seams which were rapidly developed after the extension of railways.

Population increases at the regional scale were only slightly less dramatic than those which occurred in the mining towns. The regional population nearly doubled over the three decades, rising from 331,339 in 1890 to 615,920 in 1920.³⁷ Much of the population growth, early in

³⁴B. H. Schockel, "Changing Conditions in the Kentucky Mountains" Scientific Monthly Vol. 3 (August, 1916), p. 109.

³⁵Davis, op. cit., p. 174.

³⁶Kentucky Bureau of Agriculture, 1910, op. cit., pp. 231-232; 302; and 335.

³⁷U.S. Bureau of the Census, Censuses of Population, 1910 and 1920.

the period, seems to have occurred through natural increase. Davis, for one, suggested that the change between 1840 and 1910 was "almost entirely genetic."³⁸ Campbell noted that the area's growth between 1890 and 1910 was surprisingly high since the region was not regarded as having natural advantages which would attract population.³⁹ Further support of the significant role played by natural increase is offered in State Agricultural Commissioner's Reports of 1901 where local officials in Knott and Morgan counties expressed concern that their counties had grown steadily without perceptible in-migration.⁴⁰ At approximately the same period, Semple eloquently summarized the demographic character of the more mountainous areas by writing that:

One can travel 40 miles along one of the head streams of the Kentucky River and find the same names recurring in all the cabins along both its shores. One woman in Perry County told us she was related to everybody up and down the North Fork of the Kentucky and its tributary creeks. In Breathitt County, an old judge, whose family had been among the early settlers on Troublesome, stated that in the district school near by there were ninety-six children, of whom all but five were related to himself or his wife.⁴¹

³⁸ Davis, op. cit., p. 53.

³⁹ Campbell, op. cit., p. 77.

⁴⁰ Kentucky Bureau of Agriculture, Labor and Statistics 14th Biennial Report 1900-1901 (Louisville: George G. Fetter Printing Company, 1901), p. 164 and p. 236.

⁴¹ Semple, op. cit., p. 65

After 1910, coal mining provided an impetus for in-migration and gave rise to concentrations within the previously dispersed rural population. Elsewhere, mine railway expansion, along with industrialization in Boyd County, brought about higher rates of population increase. Variations in the spatial expression of these forces of change were apparent in each decade between 1890 and 1920 (Figure IV-6).

Between 1890 and 1900, all counties gained in population with only seven showing increases of less than twenty percent. Increases between twenty and thirty percent occurred in Johnson, Laurel, Knox, and Pulaski counties where railroads and mining were well-established. Of the counties with growth rates between thirty and forty percent, only Boyd and Floyd were served by railroads. At this time, railway penetration and mining in Letcher, Perry and Pike counties were as much as twelve years in the future. Growth in excess of forty percent occurred in Bell and Whitley counties, which were the two major coal producers of the period.

The high rate of change (60-70%) in Breathitt, Harlan, Knott, and Leslie counties amounted to an addition of around 3,000 people per county and preceeded by more than a decade the railway development necessary for substantial mining employment. Population densities in these southeastern counties averaged 18 to 45 per square mile in 1890⁴² and farmland, however marginal, remained cheap.

⁴²Davis, op. cit., p. 53.

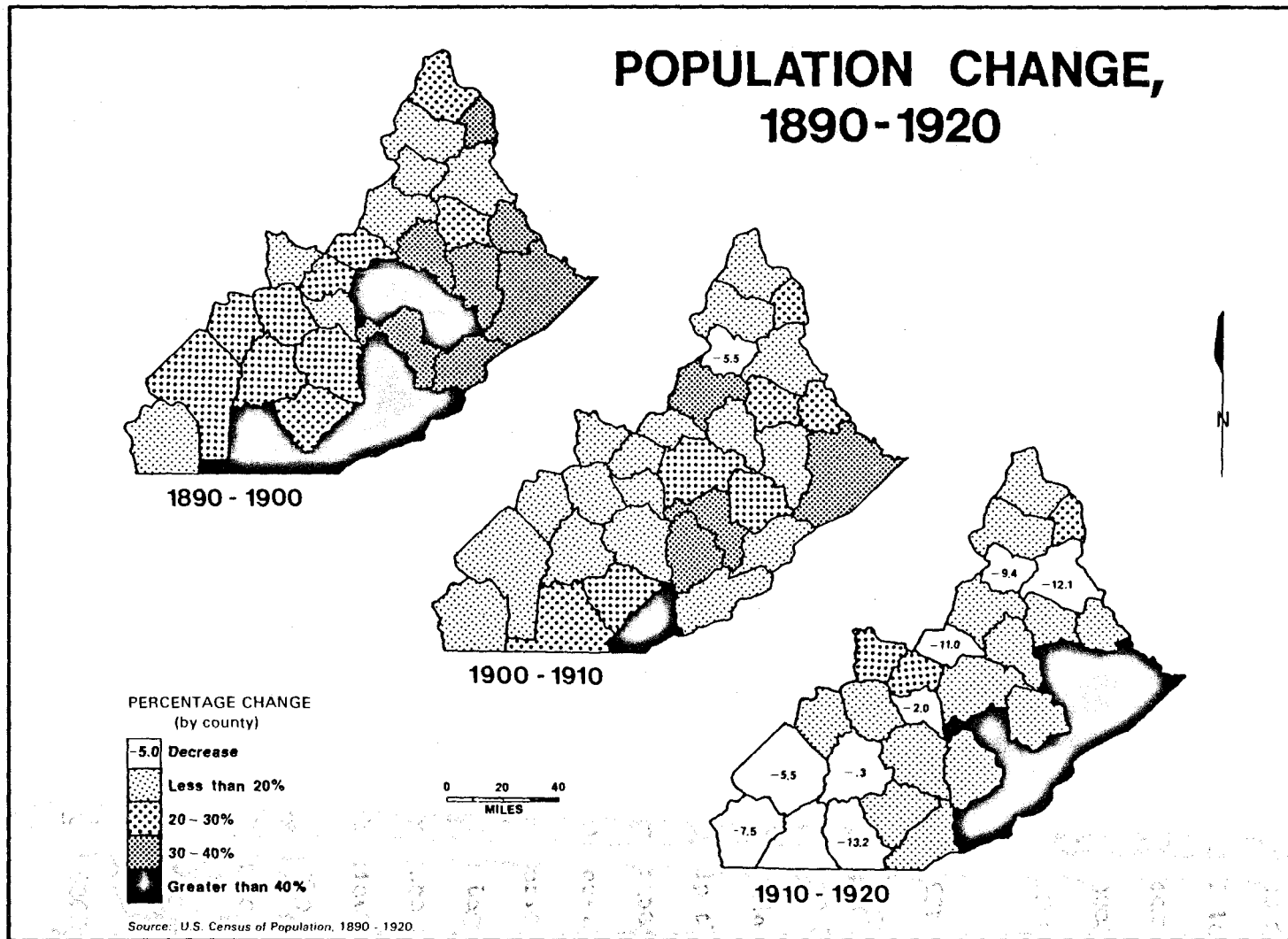


Figure IV-6. Population Change, 1890-1920.

Agricultural areas seem to have absorbed much of this population increase, as approximately 300 farms were added in each of the four counties.⁴³ A rise in the number of farms cannot, however, be wholly interpreted as a product of settlement because subdivision of larger farms, especially among families, was becoming increasingly common. Whether or not a continuing settlement process or natural increase was more prevalent, the fact remained that population increase was occurring in areas which held little economic opportunity.

The tempo of increase moderated substantially between 1900 and 1910, and one county, Elliott, lost population during the decade. Few opportunities existed there and out-migration occurred, either beyond the region to northern cities or south to areas of expansion in the mining industry. Most of the region's counties, particularly those on the western border, showed gains of less than twenty percent. Relatively high rates (between twenty and thirty percent) persisted in mining areas. Increases surpassing thirty percent were experienced in Leslie, Morgan, Pike, Perry, and Bell counties. Except for Leslie County, coal mining was beginning to assume limited importance as railway extensions allowed commercial operations to be initiated in parts of these areas. Bell County's 81.2 percent gain was the region's highest, and occurred in response to expanded mining activity as railroads extended up the Cumberland River valley toward Harlan County.

⁴³ U.S. Bureau of the Census, Censuses of Agriculture, 1890, and 1900.

Between 1910 and 1920, Elliott County lost population, as it had in the preceeding decade. Similar trends occurred in Lawrence, Owsley, and Wolfe counties. Out-migration here may have also been a response to employment opportunities which developed in the southeastern counties. Losses also occurred in Wayne, Whitley, and Pulaski counties, but this was due to population included in McCreary County when it was formed in 1912. Over the region, the number of counties showing pronounced gains diminished, as only ten recorded increases of more than twenty percent. The impact of mining, however, was apparent, with phenomenal rates of growth occurring in the southeast. Increases of 47 and 56 percent in Floyd and Pike counties were low when compared with those in Letcher (130%), Perry (131%) and Harlan (198%). More than 100,000 people, accounting for 38 percent of the regional increase between 1890 and 1920, were added in this last decade.⁴⁴ Mining also experienced exceptional growth. To illustrate this point, a comparison of the number of mines operating in 1916 with the number operating in 1920 shows an increase in Letcher County from eight to forty five, from sixteen to sixty two in Floyd County, and from twenty-eight to seventy eight in Pike County.⁴⁵

People did not always pour into the mining camps overnight popular literature suggests, nor did they immediately abandon the

⁴⁴U.S. Bureau of the Census, Censuses of Population, 1910 and 1920.

⁴⁵Kentucky Department of Mines, Annual Reports for the Year 1920 (Frankfort: The State Journal Company, 1921), pp. 10-34.

mountain farm in favor of the mine portals.⁴⁶ Railway construction and initial mining operations were often accomplished by labor brought in from outside the region. When extending its route into southeastern Kentucky in 1902 and 1903, the Chesapeake and Ohio Railroad found the local labor supply engaged in farming and brought in Negroes from West Virginia.⁴⁷ Early progress in southwestern Pike County was delayed by the lack of available miners.⁴⁸ Perhaps the most unusual labor solution took place when the Consolidation Coal Company contracted a team of Austrian loggers to cut timber for the construction of Jenkins.⁴⁹ As mining developed at places like Jenkins, McRoberts, Dunham and Burdine, many of the employees were natives of the area but they were joined by blacks from Alabama and Georgia and workers from Pennsylvania or West Virginia, who had originally come from Poland, Italy, Czechoslovakia, Hungary, and Austria. Housing in many of the mining towns was segregated, both racially and ethnically, and dampened the impact of cultural change.⁵⁰ The net effect of the immigration of these groups was significant in that it changed

⁴⁶Caudill, op. cit., p. 103 and 113.

⁴⁷Chapman, op. cit., p. 109.

⁴⁸Stone, op. cit., p. 346.

⁴⁹Chapman, op. cit., p. 150, and Williams, op. cit., p. 14.

⁵⁰Chapman, op. cit., p. 160; Shackelford and Weinberg, op. cit., pp. 160-162; 211-212.

the composition of a regional population that included a remarkably low percentage (less than 2% in 1910) of foreign-born.⁵¹

The Impact of Mining on Agriculture

Poor transportation facilities had long hindered commercial agriculture. Roads were so poor that farms located only a few miles from a railroad were almost as effectively isolated from markets as they would have been at greater distances. Opening of the railways then, did little to stimulate agricultural production in most portions of the area.⁵² Limited also by rugged topography and thin soils, the region's agricultural productivity had come under stress from population pressure and poor land use practices. By the turn of the century, many farms contained depleted soils after being continuously cropped, usually in corn, for fifty years.⁵³ Observers in a number of counties were reporting that "the lands are badly worn."⁵⁴ The farmers' response to declining yields was simple-clear more land, regardless of the slope, and abandon previously cultivated areas. So widespread was this process that the amount of land cleared between 1900 and 1920 was almost balanced by abandonment.⁵⁵ Many farmers had come to expect only

⁵¹Davis, op. cit., p. 33.

⁵²Ibid., p. 114; Schockel, op. cit., p. 117.

⁵³S. C. Jones, "Soils of the Eastern Coal Fields" Kentucky Geological Survey Series 4, No. 1, Pt. 2 (Frankfort: State Journal Company, 1906), p. 1078.

⁵⁴Kentucky Bureau of Agriculture 1900-1901, op. cit., p. 172.

⁵⁵Davis, op. cit., pp. 100-104.

two or three crops before soil exhaustion prompted repetition of the practice on a new parcel of land. The mountain farmer seemed to stoically accept the disappointing returns for his investment of labor. Increasingly marginal tracts of land came under cultivation and accounts of the region's agriculture almost universally painted a dismal picture. The most graphic was J. Russel Smith's evaluation of the gullying and erosion on steeply sloping corn patches as "trade-marks of agricultural savagery."⁵⁶

These problems limited the positive impact that coal mining could exert on agricultural patterns. Ideally, the mining communities would create the long-needed markets for local produce. In some mining areas, farmers within a radius of five to ten, and in some instances twenty miles, of the mining towns, grew vegetables for sale in those places. However, this trade was hampered by poor local transportation and produce was commonly taken to market by trail in sacks slung over the backs of horses and mules.⁵⁷ Company policies which included space for miner's garden plots in plans for some of the mining camps may have also discouraged increased production from the farms.⁵⁸ At any rate,

⁵⁶ J. Russell Smith, "Farming Appalachia," American Review of Reviews, Vol. L111 (April, 1916), p. 332.

⁵⁷ A. F. Crider, "The Coals of Letcher County" Kentucky Geological Survey Fourth Series, Vol. 4, Pt. 1 (Frankfort: The State Journal Company, 1916), p. 11.

⁵⁸ Kentucky Department of Mines, Annual Report for the Year 1915, Parts 1 and 3 (Frankfort: The State Journal Company, 1915), pp. 106-107.

local production failed to meet demands in several counties. Agricultural reports for Bell County, experiencing a coal boom in 1901, as well as those for Breathitt and Whitley in 1910, indicated that food had to be supplied from outside sources. In Martin County, which unlike the others, had no significant coal production, an estimated \$25,000 worth of produce was being shipped in annually.⁵⁹ By 1914, mining had assumed considerable importance in Perry and Pike counties, yet agriculture was reported as receiving little attention, suggesting that mine-related markets had generated no meaningful patterns.⁶⁰ The region's poor physical base and agricultural practices made it impossible for Kentucky farmers to compete with other areas where better land and mechanization permitted efficient production.

For many years, the area's value of agricultural production had lagged behind that elsewhere in the state and as the region's farms became smaller, the gap had widened by 1920. The average value of products per farm in eastern Kentucky was \$1210, or just slightly more than fifty percent of the average farm in the state. The highest values (\$1500-\$1600) were realized in Boyd and Greenup counties, near the region's major urban-industrial concentration. Production amounting to less than \$1,000 per farm occurred in areas of rugged

⁵⁹ Kentucky Bureau of Agriculture, 1900-1901, op. cit., p. 32.

⁶⁰ Kentucky Bureau of Agriculture, Twelfth Biennial Report, 1914-1915 (Frankfort: The State Journal Company, 1915), p. 49.

terrain. Elsewhere in the region, no more than a \$200 difference per farm existed, a feature similar to the uniformity of patterns in earlier decades.⁶¹

The cumulative effect of mining did more to discourage agricultural productivity than to promote it. The construction of railroad sidings, tipples, and towns converted prime valley lands into non-agricultural uses. Perhaps more important was the fact that many of the region's farmers saw mining employment as an alternative to agriculture, rather than as a market for farm products.

The Impact of Mining on Forestry

The immediate impact on forestry was seen in local consumption of timber. Initially, the construction of tipples, barns, and houses made the acquisition of timber a pre-requisite in plans for large scale mining. Use inside the mines was also considerable. To insure long term supplies and control costs, many companies negotiated mineral rights which included the privilege of cutting any timber needed in mining. Ash and oak were preferred because they did not split easily⁶² and were used for timbers, props, and rails in the room-and-pillar mining plans. An estimated four and one-half board feet of timber were consumed in the production of one ton of coal in 1910.⁶³ Major coal producing counties such as Bell, Knox, Laurel, and

⁶¹U.S. Bureau of the Census, Census of Agriculture, 1920.

⁶²Jean Thomas, Big Sandy (New York: Henry Holt and Company, 1940), p. 117.

⁶³Kentucky Bureau of Agriculture, 1910, op. cit., p. 166.

Whitley emerged as the region's chief areas of timbering and logging. Timber cut in each of those counties for mining props alone during 1910 amounted to more board feet than were harvested in the Kentucky portion of the Big Sandy River Basin in the same year.⁶⁴ Use of timber in these areas occurred so rapidly that two decades of expanding mining activities pushed reserves toward the point of depletion and stimulated forestry in adjacent counties. Mine inspection reports indicate that timbers were drawn, where possible, from worked out sections within the mines, but the accelerated growth of coal operations insured a market for this kind of forest product.

The Impact of Railroads on Forestry

Like pre-railroad era coal mining, timbering and logging had chiefly been carried out during slack agricultural seasons and depended on rises in the creeks and rivers for transportation to market.⁶⁵ As railways were extended to reach coal deposits in central and southeastern areas, the distance over which timber had to move by water was greatly decreased. Vast stands of timber became more easily marketed. The eastern Kentucky forest held valuable species of poplar, oak, and walnut in supplies which were abundant relative to other parts of the eastern United States. Sawmilling centers such as Jackson, in Breathitt County, and Wasioto, in Bell County, shipped lumber and logs

⁶⁴Ibid., p. 141.

⁶⁵W. T. Griffith, "Big Sandy Coalfields, Kentucky" Engineering and Mining Journal, Vol. 92 (September 9, 1910), p. 508.

to Chicago, San Francisco, Montreal, and Great Britain.⁶⁶ Big mills such as these and numerous smaller operations undoubtedly comprised a majority of the establishments reported for the mountain counties in the Census of Manufactures for 1920. Rail transport accelerated the cutting of timber so that virtually untouched stands were often removed in only one decade following the advent of railway access.⁶⁷ Railroads also created a local market for less valuable timber which was made into cross ties. Ties had an average life of seven years and railroads of the era used from 2,850 to 3,000 for each mile of track.⁶⁸ Production of ties normally took place on small farm wood lots, where farmers were able to turn out ten ties per day. In the summer of 1916, ties brought thirty-eight cents a piece and thus represented a substantial supplement to farm income.⁶⁹ In areas where agricultural yields had diminished, many farmers depended heavily on the sale of ties and staves.⁷⁰ Cash netted from timbering created an alternative to agriculture, and decreased the emphasis on crops on many of the region's farms. As several observers pointed

⁶⁶Writer's Program of the Works Project Administration, In the Land of Breathitt (Northport, N.Y.: Bacon, Percy and Daggett, 1941), p. 60; J. C. Tipton, The Cumberland Coalfield (Middlesboro, Ky.: Privately printed, 1905), no pagination.

⁶⁷Davis, op. cit., p. 40.

⁶⁸Verhoeff, The Kentucky River Navigation, op. cit., p. 193.

⁶⁹Schockel, op. cit., p. 110.

⁷⁰Ibid., p. 20.

out, timbering exerted negative effects on agriculture by increasing soil erosion, triggering a vicious cycle of increased timbering to offset the cost of buying food previously grown on the farm.⁷¹

The Position of Coal in National Markets

The major change in the geography of the mining, marketing, and value of coal over the three decades hinged more on the quality than on the accessibility of coal deposits. The output of the region's mines had increased dramatically in response to wartime demands, and national markets, in addition to traditional Kentucky linkages, had been established. For illustration, shipments of coal from three multi-county trade districts, Northeast Kentucky, Southeast Kentucky, and the Hazard Field are delineated for discussion. Differences in the character of coal in each of the three fields resulted in variations in the major markets for each (Table IV-1).

The geography of Northeastern Kentucky shipments was heavily influenced by the demand for coal in by-product coke ovens, coal-gas plants, and steel works. Eighty-seven percent of this coal was suitable for coking, making it too valuable for use as railroad fuel. As a result, over half of it was shipped to consumers in heavily industrialized areas in Illinois, Indiana, Michigan and Ohio (Figure IV-7). Preferable qualities for domestic use also gave the product of this field a wide market, but competition from fields in West Virginia and Pennsylvania largely confined the Northeast

⁷¹Smith, op. cit., p. 332.

TABLE IV-1

MARKETS FOR EASTERN KENTUCKY COAL, 1918

Market	Percent of total shipments from:		
	N.E. Ky. Field ^a	S.E. Ky. Field ^b	Hazard Field ^c
Industrial, including Iron and Steel	51.3	41.8	27.0
Retail Coal Dealers	13.4	23.9	38.4
Gas and Electric Utilities	14.7	10.4	6.7
Railroad Fuel	6.5	17.9	13.7

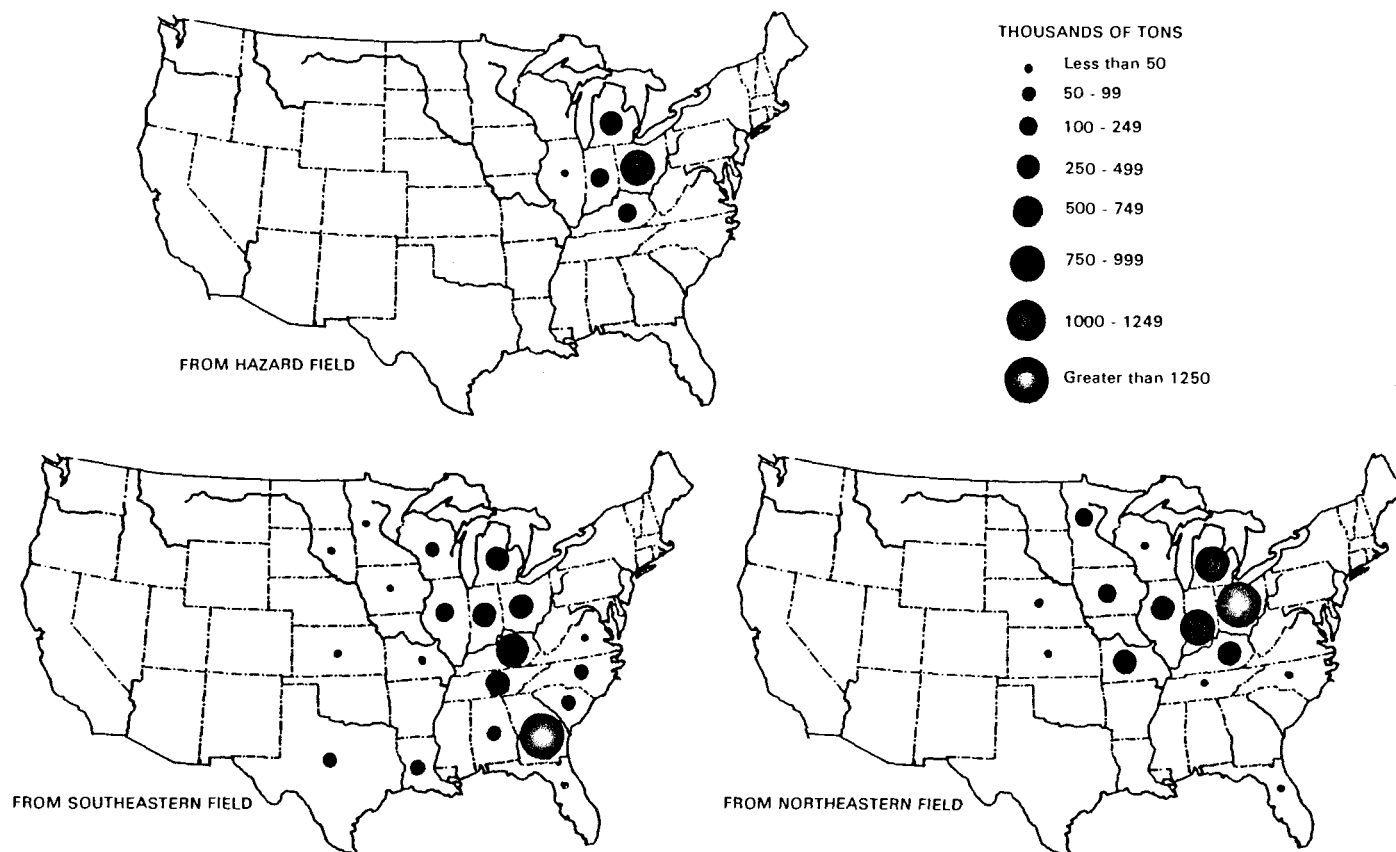
^aNortheastern Field includes the following counties: Letcher, Knott, Pike, Floyd, Johnson, Martin, Carter, and Boyd.

^bSoutheastern Field includes the following counties: Laurel, Clay, Knox, Bell, Harlan, Whitley and McCreary.

^cHazard Field includes the following counties: Lee, Breathitt, and Perry.

Source: Leshner, C.F. Distribution and Consumption of Coal in 1918, Mineral Resources of the United States, U.S. Geological Survey, 1921, p. 1373.

Destination of Eastern Kentucky Coal Shipments, 1918



Source: U.S. Geological Survey Tech. Bull. No.308.

Figure IV-7. Destination of Eastern Kentucky Coal Shipments, 1918.

Kentucky coal to Midwestern markets.⁷²

Southeastern Kentucky shipments displayed a similar pattern in the Midwest, but because more than half was steam, rather than coking quality coal, the markets were more widespread in the southeastern states (Figure IV-7). Twenty-three percent of the coal moved to the industrial Midwest, mainly as flows from captive metallurgical coal mines in Harlan County. The southeastern coal operators' success in capturing the Piedmont market was evident, with twenty-one percent going to those states, especially to Georgia.⁷³

Forty-seven percent of the Hazard output was shipped to Ohio, Indiana, and Michigan (Figure IV-7). Retail trade for domestic heating provided the greatest demand, followed closely by use in the manufacture of illuminating gas and coke. Rail connections from this field were established later than those in most of the Southeastern area, and as a result, the Hazard field had a smaller share of markets in Kentucky.⁷⁴

The Regional Economy in 1920

Considerable realignment in the relative value of economic activities had occurred since 1890. In general the significance of agriculture declined as an input to county level economies

⁷²U.S. Bureau of Mines, Technical Paper No. 308 (Washington, U.S. Government Printing Office, 1922), p. 12.

⁷³Ibid., p. 14-15.

⁷⁴Ibid.

(Table IV-2). Part of the role previously held by agriculture shifted to manufacturing sector where sawmilling increased, while counties such as Harlan, Letcher, Perry and Pike relied as heavily on mining as they had on agriculture in past decades. The majority of the region's 35,000 mining employees worked in those counties.⁷⁵ marked concentrations of mining, rather than a regional dependence on coal were apparent. No values for coal production were recorded in nine counties; in twelve others its importance was limited, contributing less than ten percent of the total value of economic activities (Table IV-2).

Manufacturing employment remained concentrated in the northeast. Boyd and Carter counties held approximately 35 percent of the region's 11,000 manufacturing jobs.⁷⁶ Notable increases had occurred in Whitley, Breathitt and Lee counties as timbering expanded. Twenty to thirty sawmills operated in those counties and wood processing accounted for most of the establishments in areas where less manufacturing had previously existed.⁷⁷

⁷⁵U.S. Geological Survey, Mineral Resources of the United States, 1921, Part II (Washington: U.S. Government Printing Office, 1922), p. 588.

⁷⁶U.S. Bureau of the Census, Census of Manufactures 1920, Table 2, p. 217.

⁷⁷Kentucky Bureau of Agriculture, 1910, op. cit., pp. 34; 63; and 64.

TABLE IV-2

VALUE OF ECONOMIC ACTIVITY BY COUNTY, 1920

County	Total Value (dollars to nearest thousand)	Percent of total value contributed by:		
		Agriculture	Manufacturing	Mining
Bell	11468	14.1	40.2	45.7
Boyd	20748	6.6	92.5	0.9
Breathitt	4578	58.3	34.5	7.2
Carter	4689	33.2	59.9	6.9
Clay	4079	87.8	8.7	3.5
Elliott	2257	96.7	3.3	None Reported
Estill ^b	2617			None Reported
Floyd	7029	40.4	8.5	51.1
Greenup	4791	35.5	65.5	None Reported
Harlan	12108	12.5	2.8	84.7
Jackson	2733	85.1	14.9	None Reported
Johnson	4945	50.5	2.7	46.8
Knott	2411	98.8	1.2	None Reported
Knox	5329	60.3	10.0	29.7
Laurel	4009	85.6	9.2	5.2
Lawrence	3866	90.1	8.7	1.1
Lee	2572	49.3	44.1	6.6
Leslie	1785	96.8	3.2	None Reported
Letcher	9993	20.4	3.4	76.2
McCreary ^b	5109			
Magoffin	2632	95.9	4.1	None Reported
Martin ^c	1102			
Morgan	3945	79.3	15.1	5.6
Owsley ^a	1829			
Perry	9623	18.5	7.7	73.8
Pike	19004	24.5	12.8	62.7
Pulaski	9789			
Rockcastle	3277	92.7	7.3	None Reported
Wayne ^a	3920	90.1	9.9	
Whitley	7680	40.1	35.9	24.0
Wolfe	1681	87.8	12.2	None Reported

^aTotals for these counties reflect the input of agriculture and manufactures only. Value of coal mined was reported collectively with other counties outside the region.

^bDoes not include manufactures, which were reported collectively with counties outside the region.

^cIncludes only agriculture, both manufactures and mining values were reported collectively with other counties outside the region.

Source: Compiled by the author from U.S. Census, 1920, Censuses of Agriculture and Manufactures, and Mineral Resources of the United States, 1921, Part II.

Among counties which showed high percentages of agricultural values, Clay, Leslie, Knott, Magoffin and Wolfe all lacked rail connections which might have allowed timbering to supplement the agrarian economy. Laurel County's economic structure was similar, and was an example of renewed dependence on agriculture after coal reserves were depleted.⁷⁸ With this exception, the agricultural counties of 1920 had also been predominantly agricultural in 1890.

An expanded railroad network had facilitated the securing of coal markets and converted the economic base of several southeastern counties from agriculture to coal mining. Coal operators had fared well during the war years, profiting especially at times when strikes suspended production elsewhere. Others would seek to share their successes, generating another coal boom in the 1920's.

⁷⁸Kentucky Bureau of Agriculture, Labor and Statistics, 21st Biennial Report 1914-1915, (Frankfort: The State Journal Company, 1915), p. 401.

PROSPERITY AND DEPRESSION: REGIONAL ECONOMIC CHANGE

1920-1930

In the mid 1930's eastern Kentucky, similar to other areas in the southern Appalachian region, was recognized by the Federal Government as a special poverty area among places severely affected by the Great Depression. The largely rural population's heavy dependence on extractive industries and non-commercial agriculture created imbalances between population size and economic opportunity which were identified as principal causes of poverty.¹ These imbalances resulted from a long-term process of change. Three interrelated elements: 1) growth in extractive industries, especially coal mining; 2) a steady decline of commercial agriculture; and 3) continued population growth, all had been important since the 1890's.

The population of eastern Kentucky increased by 126,000 between 1920 and 1930 and by another 110,000 between 1930 and 1940.² As in other parts of the nation, population growth vastly exceeded economic growth. Few areas of the country had less potential for supporting an increasing population at this time than did eastern Kentucky. Rates of natural increase were more than twenty four percent, or twice the national average. Before 1930, mining provided alternative employment

¹U.S. Department of Agriculture, Miscellaneous Publication No. 205, op. cit., pp. 3-6; Goodrich, et al., op. cit., pp. 61-62.

²U.S. Bureau of the Census, Censuses of Population, 1930 and 1940.

to farming and enjoyed considerable expansion and relative prosperity. During the 1930's farming was the chief alternative to employment in the depressed coal industry, and the Cumberland Plateau's farm population had the lowest incomes in American agriculture.³

Population Change 1920-1940

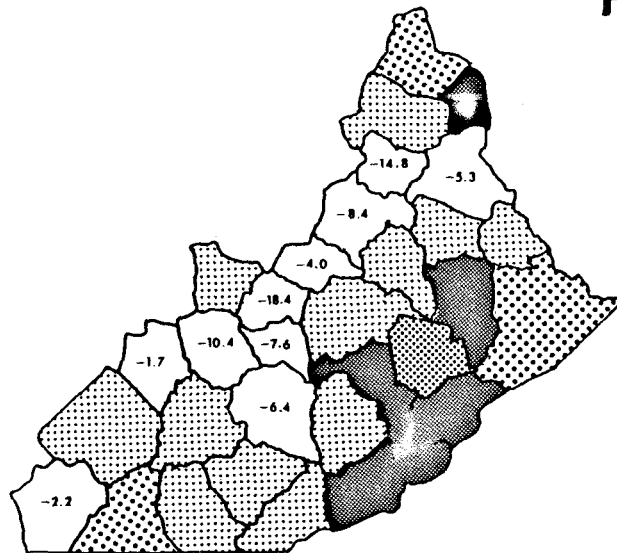
The region's population growth between 1920 and 1930 slightly exceeded that of the preceding decade, but more counties experienced population losses than before. Generally, county-level growth patterns were related to trends which had persisted in the mining industry since the turn of the century. The most substantial increases of the decade were concentrated in the southeastern counties such as Harlan (104.6%), Perry (62.0%), Floyd (52.9%), Letcher (45.9%), Knott (30.7%), and Pike (27.9%), where coal mining continued to expand (Figure V-1). Outside this area, growth also accompanied mining in McCreary County, and in Boyd and Greenup counties, which were centers of employment in the manufacture of steel and brick. Dramatically smaller increases (less than 10%) occurred in Laurel, Knox, and Whitley counties as mining waned after longer periods of development.⁴

Areas of population loss formed a roughly contiguous tier of counties on the western flank of the region. Of these, Wayne, Rockcastle, Lee and Morgan counties had been relatively important in

³Goodrich, op. cit., pp. 59-79.

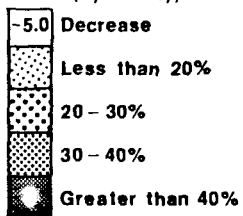
⁴Ibid.

POPULATION CHANGE, 1920-1940

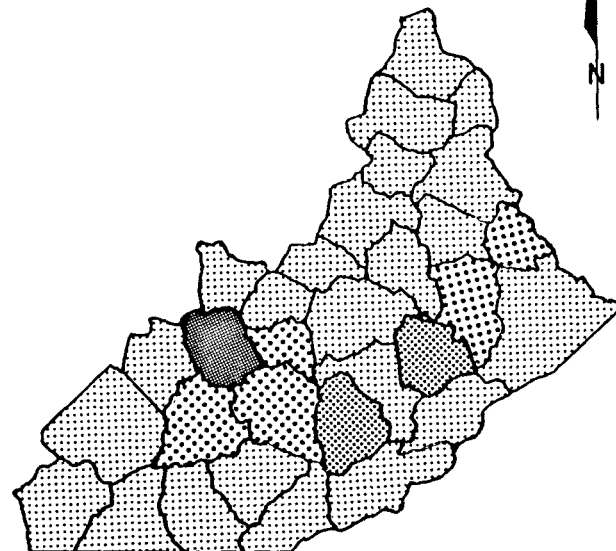


1920-1930

PERCENTAGE CHANGE
(by county)



0 20 40
MILES



1930-1940

Source: U.S. Census of Population, 1920 - 1940.

Figure V-1. Population Change, 1920-1940.

the mining industry's early development, but were not underlain by coal seams of the thickness or quality sought by large-scale operators after the First World War. With the exception of some logging, the remaining counties' economic base rested almost solely on agriculture. Wayne, Owsley, Wolfe, Elliott, and Lawrence counties had also lost population between 1910 and 1920, thus experiencing two decades of outmigration. Sustained movement from these counties was not only a function of the relative absence of local employment alternatives but also of their proximity to industrial growth elsewhere. Mining provided steadily increasing employment in counties to the southeast, attracting workers from farms in bordering counties.⁵ Those leaving eastern Kentucky for other states primarily sought factory jobs in Ohio, Indiana, Michigan, and Pennsylvania.⁶

Population movements became easier as roads improved after 1920. Paved (or even gravel) surfaces were extremely rare in earlier years; graded earth surfaces were considered to be improved roads. Sandstone, rather than the limestone used in macadamized road building, outcropped over much of the area, making permanent improvements expensive.⁷ Even though dirt roads were often barely passable in

⁵U.S. Department of Agriculture, Miscellaneous Publication No. 205, op. cit., p. 124.

⁶Howard W. Beers and Catherine P. Heflin, People and Resources in Eastern Kentucky, Kentucky Agricultural Experiment Station Bulletin 500 (Lexington: The University of Kentucky, May, 1947), Table 3, p. 11.

⁷Kentucky Department of Roads Second Biennial Report (Nov. 1, 1913-Nov. 1, 1915) (Frankfort: The State Journal Company, 1916), p. 70.

summer, and impassable from December to April, most counties made no applications for state or federal highway aid after such funds became available in 1915. Political disagreements over the allocation of funding and a lack of planning frequently added to the problem of building roads over rugged terrain.⁸ By the 1930's a basic network of paved or gravel routes had been developed, increasing accessibility within mining areas and to areas outside eastern Kentucky (Figure V-2).

Although the rate of increase ebbed slightly, the region's population continued to rise during the 1930's. The most significant feature of this trend was its relatively even distribution over the region (Figure V-1). Growth in the coal-producing counties slowed for the first time in several decades and previous patterns of outmigration were reversed as well. These changes were essentially expressed in a backflow of population to the region's farms and involved population increases operating in a period of industrial decline.

High birth rates also accounted for substantial population growth. Ratios of 700-900 children under five years of age per 1000 women of child-bearing ages prevailed throughout most of the region.⁹ These figures were nearly double the national average in 1930 and exceeded those elsewhere in the southern Appalachian region.¹⁰ The region's

⁸Ibid., pp. 39-82.

⁹F. G. Tryon and B. W. Allin in Goodrich, et al., op. cit., p. 63.

¹⁰U.S. Department of Agriculture, Misc. Publication No. 205, op. cit., p. 133.

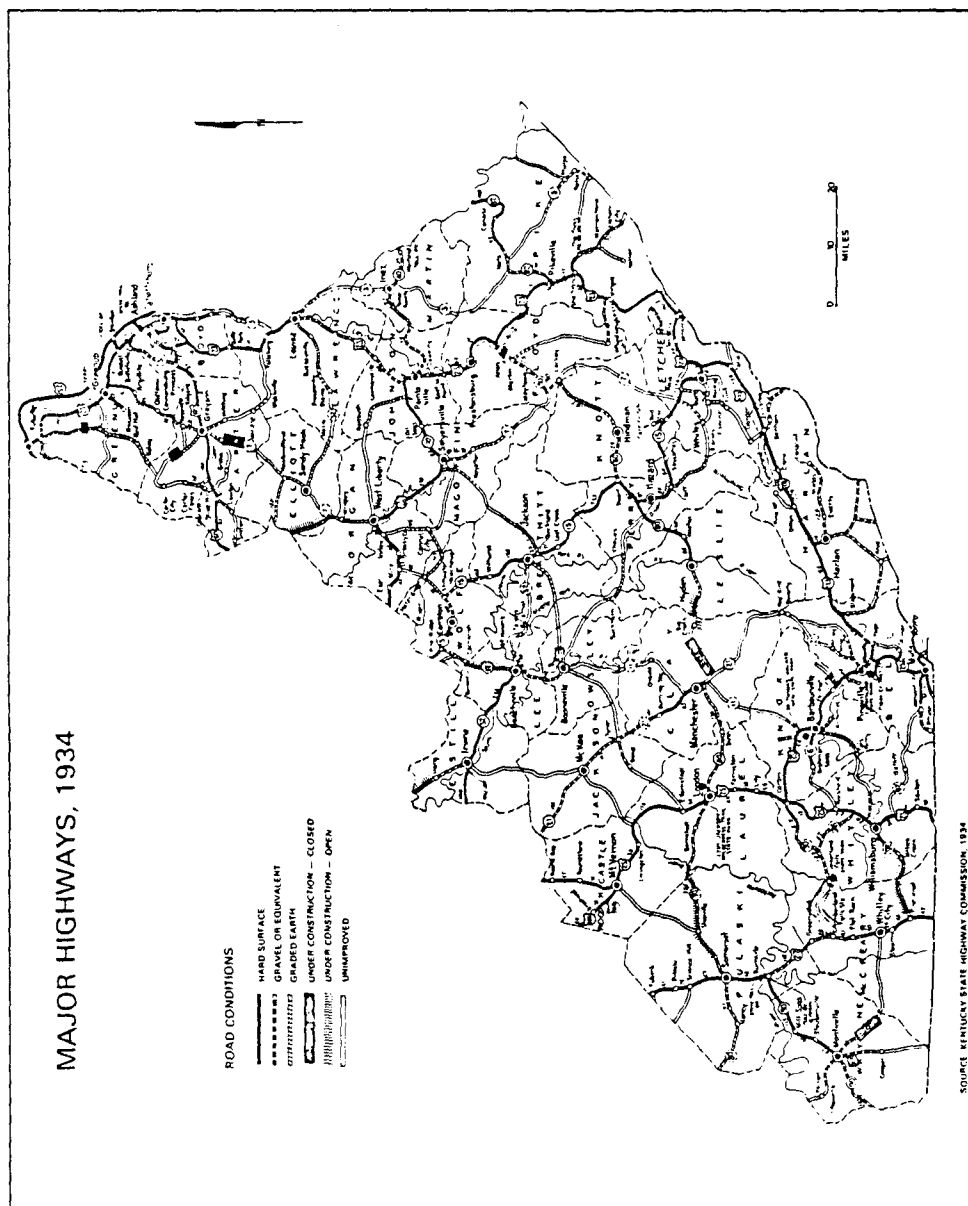


Figure V-2. Major Highways, 1934.

highest rural-nonfarm family sizes were found in the coal producing counties of eastern Kentucky.¹¹ Rural farm families were larger by approximately one person, but families of as many as ten to thirteen children were frequently reported by older women.¹² Population pressure resulting from return migration was significantly increased by high birth rates. Although rates of population change varied less geographically than they had in preceeding decades, significant concentrations existed as residual effects of the coal industry's expansion.

Expansion and Decline of the Coal Industry

Following the First World War, miners in the unionized fields of Illinois, Ohio, and Pennsylvania struck in an effort to end wage controls established under wartime contracts. Their movement ultimately spread to nearly every coalfield in the country. At its peak, from November 1 to December 12, 1919, the strike involved all but a few districts and suspended 71 percent of the nation's mine capacity. The non-union eastern Kentucky field was relatively unaffected. Some areas experienced walk-outs for only a day, and in most counties the strike's duration was no more than one week.¹³ As a result, 570,000

¹¹ Ibid., p. 131.

¹² U.S. Department of Agriculture, Family Living in Knott County Kentucky, Technical Bulletin No. 576 (Washington: U.S. Government Printing Office, August 1937), p. 11.

¹³ F. G. Tryon and Sydney A. Hale, "Coal in 1919, 1920 and 1921," Mineral Resources of the United States, 1921-Part II (Washington: U.S. Government Printing Office, 1922), pp. 504-506.

tons more than the region's 1918 record production were mined in the field.¹⁴ Eastern Kentucky's performance during the strike marked the beginning of its rise to national prominence. In fact, competitive advantages in labor conditions and high quality coal offset fluctuating markets and allowed eastern Kentucky's coal production and employment to grow at a faster rate than national mining trends during the 1920's.

Exceptionally encouraging conditions prevailed in 1920. Wartime prices set at \$2.58 per ton by the National Fuel Administration were withdrawn at a time when coal stocks in both America and Europe were low.¹⁵ From June through October, monthly spot prices ranged from \$7.13 per ton to \$9.51 per ton, f.o.b. the mines. Over the year, the market value of eastern Kentucky coal averaged \$4.44 per ton, nearly double that of the war years.¹⁶

Aware that reasonably well-run mines had been profitable during the war, many new operators were attracted into the industry. Local bankers viewed mining as a low-risk enterprise and readily approved loans for prospective operators. One young eastern Kentucky native, returning from the war in 1920, related that a banker offered him a \$10,000 loan, without security, to set up in the coal business.

¹⁴ Ibid., p. 587.

¹⁵ Ross, op. cit., p. 51.

¹⁶ F. G. Tryon and L. Mann, "Coal in 1929," Mineral Resources of the United States, 1919-Part II (Washington: U.S. Government Printing Office, 1930), p. 738.

Following the banker's advice that he "couldn't lose," within a month he and a partner were "coining money" at eight dollar a ton prices from a small mine.¹⁷ Mine development was relatively simple because coal seams outcropped on valley sides adjacent to roads and railroads, thus easing problems of shipping. Small-scale mining in these seams required little experience or engineering; their opening was determined more by the price of coal than by any other factor. Their operation was sporadic, often only in response to spot prices. Among the nation's coalfields, these "wagon mines" were estimated by the U.S. Geological Survey to be most important in the Southern Appalachians. Approximately 434 were located in eastern Kentucky, primarily in counties where large-scale mining was not well-established.¹⁸ Accounts of their output (less than 1,000 tons per year per mine) and employment are incomplete, but the Bureau of Mines reports suggest that they were active enough to disrupt short-term balances between supply and demand as well as to compete with larger mines for both labor and railway cars.¹⁹

Like many of the operators they worked for, coal loaders found that a lack of experience did not affect their chances for employment. Loaders easily made \$10 to \$15 a day in 1920, when mine operators

¹⁷Ross, op. cit., pp. 98-99.

¹⁸United States Geological Survey, Mineral Resources of the United States, 1923-Part II (Washington: U.S. Government Printing Office, 1924), pp. 601-602.

¹⁹Ross, op. cit., pp. 98; 54.

could afford to bid competitively for their services.²⁰ Considerable expansion of commercial mines occurred and employment, exclusive of wagon mines, rose from 32,721 to 35,021 in 1920.²¹

Between 1920 and 1927 the region's coal operators capitalized on the strengths of their newly secured market position and labor stability. Production and employment reached record levels during these years and did so while a general decline took place within the industry's traditional production areas of Illinois, Ohio, and Pennsylvania. Expansion in eastern Kentucky involved a southeastward shift in output and employment (Figure V-3). Production decreases appeared on the western fringe of the coalfield in a pattern similar to that of the field's historical development. Early centers of production such as Boyd, Lawrence, Lee, Morgan, and Breathitt counties all experienced notable declines.²² The areas of greatest absolute and relative increase were Bell, Harlan, Letcher, Perry, Pike, Floyd, and Martin counties.²³ Mining in the southeast was relatively recent and the thicker, more continuous, high-quality coal seams held greater potential for large-scale development. The distribution of firms producing more than 250,000 tons, which collectively accounted

²⁰Ibid., p. 52.

²¹Tryon and Hale, op. cit., p. 588.

²²Ibid., p. 587; F. G. Tryon, O. E. Kiessling, and L. Mann, "Coal in 1927," Mineral Resources of the United States 1927-Part II (Washington: U.S. Government Printing Office, 1928), Table 87, pp. 464-465.

²³Ibid.

CHANGE IN COAL PRODUCTION AND MINING EMPLOYMENT, 1920 - 1927

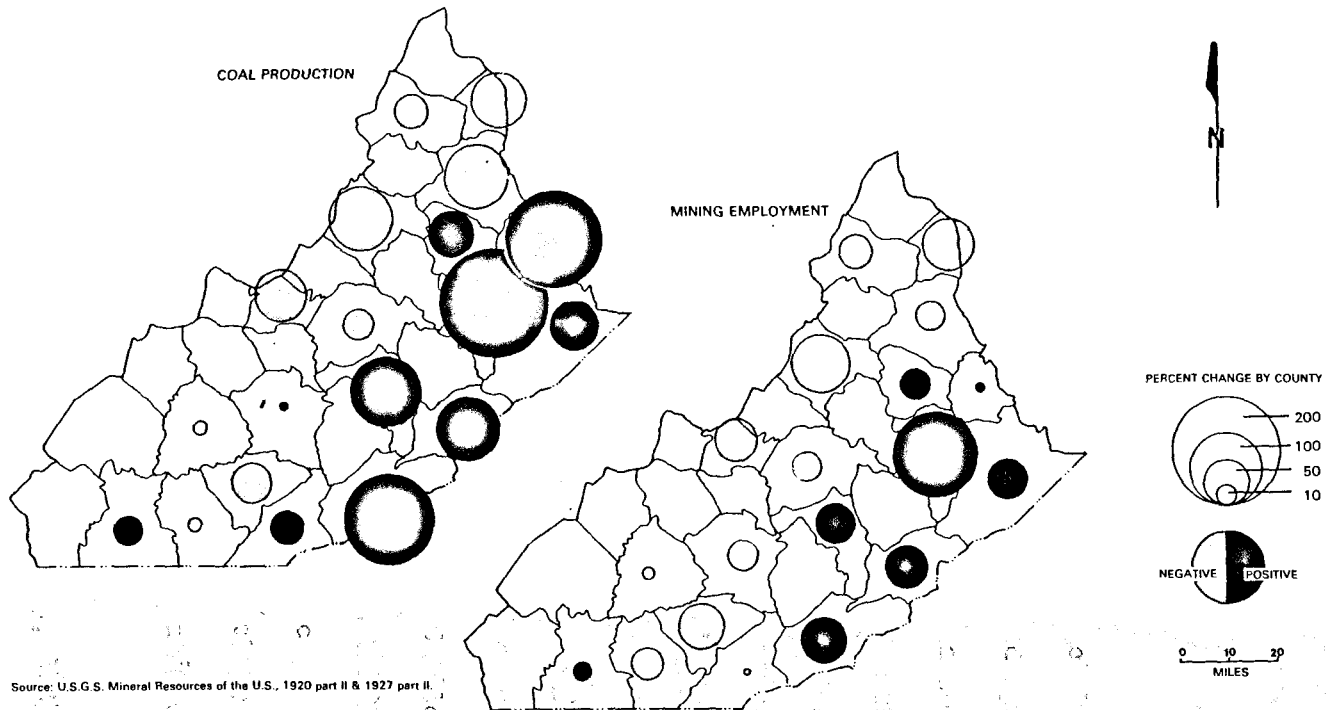


Figure V-3. Change in Coal Production and Mining Employment, 1920-1927.

for about half of the regional output in 1927,²⁴ were heavily concentrated in the southeastern part of the area (Table V-1). These concentrations also showed pronounced growth in employment (Figure V-3). Absolute changes were greatest in Harlan, Floyd, Letcher, Perry, and Pike counties. Together, they accounted for 35,291 of the region's 46,030 miners in 1927.²⁵

The mining patterns of 1927 included firms which benefited from nationally competitive labor agreements and survived sporadic market forces which sometimes encouraged unnecessary or short-lived expansion. An early incentive which caused operators to increase their labor force and production was the relationship between mine capacity and railway car supply. Between 1917 and 1920 transportation shortages, rather than demand, limited production.²⁶ Interrupted car service gave the operators little protection against the loss of contracts resulting from delayed or unsteady shipments. In an effort to resolve the problem of car shortages, the delivery of cars to mines was regulated by the Interstate Commerce Commission and allocated on the basis of a particular mine's production capacity. To insure an adequate number of cars in times of tight supply, operators expanded their labor force to increase capacity, and raise their mine-car rating. Car shortages caused by a railway switchmen's strike in the

²⁴Kentucky Department of Mines, Annual Report, 1927 (Frankfort: The State Journal Company, 1928), pp. 214-217.

²⁵Tryon, Kiessling, and Mann, op. cit., pp. 464-465.

²⁶Mineral Resources of the U.S., 1923, op. cit., p. 556.

TABLE V-1

MINING FIRMS PRODUCING 250,000 TONS OR MORE, 1927

County	Number of Firms	Largest Producer
Harlan	19	U.S. Coal and Coke
Perry	9	Blue Diamond Coal Co.
Pike	8	Fordson Coal Co.
Floyd	6	Elkhorn Piney Coal Co.
Letcher	3	Consolidation Coal Co.
Bell	3	Southern Mining Corp.
Knott	2	Wisconsin Coal Co.
Johnson	2	Consolidation Coal Co.
Whitley	1	Gatliff Coal Co.
McCreary	1	Stearns Coal and Lumber Co.

Source: Kentucky Department of Mines, Annual Report, 1927.

spring of 1920 disrupted coal movements and triggered renewed interest in escalating mine-car ratings.²⁷ Over the long-term, some of the expansion of mine capacity unfortunately occurred in response to car supplies rather than demands for coal.²⁸ Increased capacity encouraged production in excess of demand and ultimately became critical enough to force some mines to close. In 1921, for example, a national recession reduced coal prices to \$2.77 per ton, or about half of the lofty values of 1920.²⁹ Lower demands and profits effected the closure of 114 commercial operations and forced many small-scale miners to go out of business.³⁰

Coal prices rebounded slightly in 1922, stimulating production that was nearly four million tons over the output of 1920's unusual market conditions. In what proved to be the greatest annual increase of the decade, employment rose by 6,862 to total 42,660.³¹ Geographic concentrations of mining conformed to established rail patterns in the south and east (Figure V-4). Renewed activity in the region had again been promoted by strikes elsewhere in the country. From April to September, the United Mine Workers, protesting wage reductions, struck both bituminous and anthracite mines. In most eastern Kentucky

²⁷ Ibid., p. 530.

²⁸ Tryon and Hale, op. cit., p. 491.

²⁹ Ibid., p. 591.

³⁰ Mineral Resources of the U.S., 1923, op. cit., p. 534.

³¹ Ibid., p. 675.

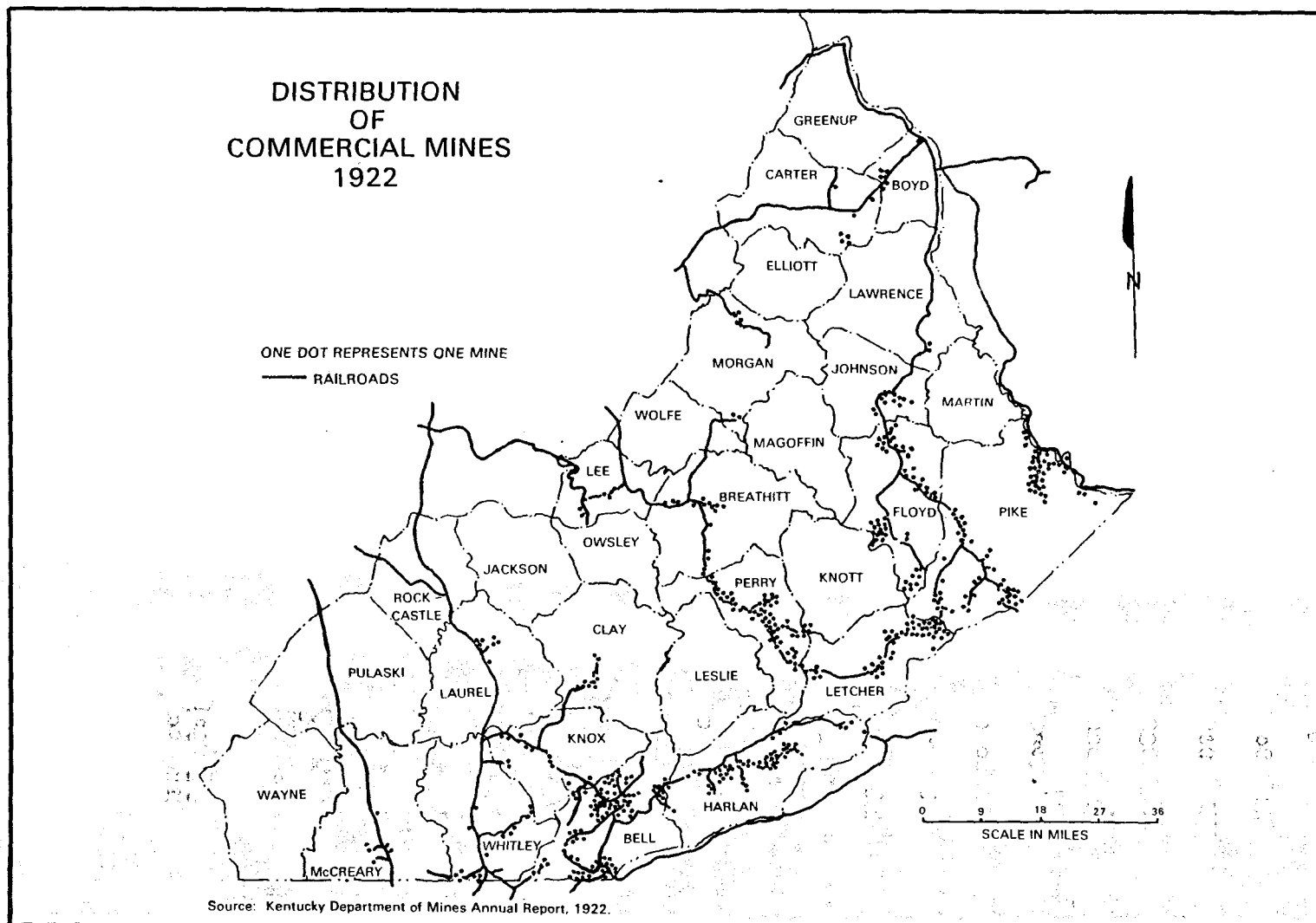


Figure V-4. Distribution of Commercial Mines, 1922.

counties the strike was observed for no more than a week.³²

During the next three years, the coal industry responded to more normal market demands than those arising in times of strikes and car shortages. A three year contract signed by the United Mine Workers on April 1, 1924 removed the possibility of strikes against bituminous coal operators. At the same time, railroads purchased new locomotives and rolling stock and moved toward greater efficiency.³³ With these external forces no longer influencing demands, the effects of gradual overproduction became apparent and the industry slumped. The imbalance between supply and demand was more severely felt in the unionized northern fields. Working under fixed wage agreements, operators there faced greater difficulty in bringing production costs in line with lower market prices. Non-union mines in the south were free, especially as mining employment became less secure, to make adjustments in wages. After paying on par with the union scale in 1922, operators in Kentucky and West Virginia cut the standard union day rate of \$7.50 by \$2.50-\$3.00 and realized a production cost advantage of 50-60 cents per ton over their northern competitors.³⁴

³²U. S. Geological Survey, Mineral Resources of the U.S., 1922-Part II (Washington: U.S. Government Printing Office, 1923), pp. 446-519.

³³F. G. Tryon and L. Mann, "Coal in 1925" Mineral Resources of the U.S. 1925-Part II (Washington: U.S. Government Printing Office, 1926), p. 396.

³⁴*Ibid.*, p. 397.

Increased competition and reduced demands soon eliminated inefficient operations. Across the nation, 2,187 commercial mines employing 116,000 men closed between 1923 and 1925. Southern fields were also affected. In West Virginia 493 mines closed laying off 7,111 workers and eastern Kentucky's 1924 mining employment included 4,251 fewer workers than in 1923.³⁵ An employment increase of 1,500 occurred there in 1925, but for the most part, steady rises in production with coal selling at \$1.80-\$1.90 per ton were accomplished by working more days, not by hiring more men.³⁶ Mines which endured through the depressed markets of 1924 and 1925 did so under great competition and sometimes sold coal at a loss to remain in business. The closing of a mine and dismissal of its labor force created long term complications greater than those arising from the short term difficulties of depressed markets. Unreported roof cracks, broken timbers, slate falls, and accumulations of water or gas all accelerated depreciation and often made reopening economically impossible.³⁷ Selling coal at a loss, however, was feasible only for firms with superior marketing linkages and excellent financial resources. Mines which were able to survive the slumping markets of 1924 and 1925 benefited from reduced competition and operated more steadily than

³⁵ Ibid., p. 379, Mineral Resources, 1924, p. 536.

³⁶ Tryon and Mann, 1925, op. cit., pp. 397 and 500.

³⁷ Morris, op. cit., pp. 6-7.

before, even though the average value of coal slipped to less than two dollars per ton.³⁸ An important feature of continued production was the region's gain in the so-called "Lake Trade," where Appalachian Coal entered Upper Mid-western markets via Lake Erie ports. In both 1926 and 1927, shipments in these markets broke all previous records. All of the increase came from mines in eastern Kentucky, West Virginia, and Virginia.³⁹

Eastern Kentucky's prosperity in the Lake Trade was short-lived. Government regulation of Great Lakes freighters by the Interstate Commerce Commission in 1927 resulted in a 20 cent per ton reduction in freight rates which subsequently spurred a decline in orders for steam coal.⁴⁰

In 1928, recession followed the recovery of the two previous years and by October, 108 of the 180 mining firms in the Big Sandy River Valley had either gone into bankruptcy, receivership or suspension.⁴¹ Over 1,700 jobs were lost in the eastern Kentucky fields, but the region fared better than other major coal producers. In Pennsylvania, 20,285 fewer miners were employed in 1928 than in 1927; in Illinois 12,700 lost jobs; over 8,000 were idled in West

³⁸Tryon and Mann, 1925, op. cit., p. 500.

³⁹Tryon, Keissling, and Mann, op. cit., p. 445-450.

⁴⁰Chapman, op. cit., p. 246.

⁴¹Ibid., p. 248.

Virginia; and over 7,500 in Indiana.⁴² In spite of declining prices which fell to \$1.67 per ton in 1929, and \$1.58 in 1930, employment in eastern Kentucky's mines remained unchanged after the decrease between 1927 and 1928. 40.3 million tons of coal were mined in 1930, 15 percent under the 1929 output. Reductions would have been more pronounced if not for a prolonged drought which curtailed hydro-electric output and shored up the market of utility serving mines.⁴³

During the second full year of the Great Depression several negative factors came to bear heavily on the coal industry. First, industrial demands diminished as annual production decreases of between thirty and forty percent were recorded in the iron, automobile and construction industries in 1931.⁴⁴ Second, coal consumers continued to move toward efficiency in their use of coal. Savings of 53 percent were realized by electric power producers, 30 percent by railroads, and steel makers required 18 percent less coal in the production of a ton of steel. Third, both fuel oil and natural gas became increasingly competitive in traditional coal markets. Fuel oil deliveries to ocean-going vessels rose by eleven percent from 1930 to 1931 while bunker coal shipments declined by 37 percent. Natural gas consumption by public utilities increased by nearly 16

⁴²F. G. Tryon and L. Mann, "Coal in 1928" Mineral Resources of the United States 1928-Part II (Washington: U.S. Government Printing Office, 1929), p. 432.

⁴³W. H. Young, L. Mann, and F. G. Tryon "Coal in 1931" Mineral Resources of the United States, 1931-Part II (Washington: U.S. Government Printing Office, 1931), p. 416.

⁴⁴Ibid., p. 416.

percent; the use of coal declined by almost ten percent. Finally, an abnormally mild winter reduced demands for coal, especially in the upper Midwest.⁴⁵ Only 31.4 million tons with an average value of just \$1.34 per ton were mined in 1931 and even the region's lower production costs could no longer forestall the downward trend previously experienced in fields north of the Ohio River. Nearly 200 of the more than 470 commercial mines operating in eastern Kentucky in 1927 had closed by the end of 1931. Average operations had slipped from 239 active days annually to 168 and nearly 9,500 jobs had been lost, with more than 6,000 miners being terminated between 1930 and 1931.⁴⁶

Mining employment became increasingly limited and insecure. Rare too, were alternative opportunities. For this reason, most miners remained in the coal camps, hopeful of enduring the slack times while being available for work on days that the mines operated. Where financial resources allowed them to do so, companies advanced scrip to retain their labor forces. It was not unusual then, in 1931 and 1932, for miners to receive pay checks which were nearly balanced by deductions for advances. Cash wages were sometimes delayed, for periods of two to three months, leaving miners virtually stranded in the mining towns. Others moved from

⁴⁵Ibid., pp. 416-421 and 456.

⁴⁶Ibid., pp. 476-477.

camp to camp, securing temporary employment as they could. In either case, those who continued to pursue work in the mines depended heavily on the companies for food and shelter, as well as income. Nearly two-thirds (64%) of the miners lived in company owned housing.⁴⁷ Some firms, such as the Consolidation Coal Company, attempted to ease the impact of the Great Depression by making land available for gardens.⁴⁸ Companies with smaller financial resources evicted their unemployed and standards of living deteriorated badly. In response to these circumstances, church-affiliated relief societies entered the coalfield to provide assistance prior to the establishment of Government-sponsored programs.⁴⁹

A survey of 956 unemployed West Virginia and eastern Kentucky miners conducted in 1932 revealed that nearly half (48.1%) viewed farming as their first occupational choice.⁵⁰ They not only saw agriculture as a solution to providing for their families, but lamented having left the farm to enter the mines. In retrospect, most held that life in the coal towns had been little better, and often worse than that on the farm.⁵¹ In spite of this attitude,

⁴⁷Morris, op. cit., pp. 80-86.

⁴⁸Chapman, op. cit., p. 254.

⁴⁹Mary Breckenridge, "The Corn-Bread Line" The Survey Vol. 64, No. 10 (Aug. 15, 1930), pp. 422-423.

⁵⁰Morris, op. cit., pp. 99-112.

⁵¹Wood, op. cit., p. 89.

mining ranked second to agriculture among the list of occupational preferences, emphasizing the miners' limited desire for work away from the mines and farms.

Developments in the Agricultural Sector

Agriculture offered little economic potential beyond subsistence. Because farms were small, very few farmers could hope to produce enough to be commercially competitive. As early as 1927, a survey of 203 families in Laurel County indicated that only 22 of them were able to depend solely on their farms for cash incomes.⁵² A similar study of 228 Knott County families reported that 76 realized no money income whatever from their farms in 1930.⁵³ The character of Breathitt County's farms, considered to be representative of those in the region in 1940, was described as follows:

Farms....are almost all part-time subsistence farms, producing chiefly garden crops, corn, livestock products for home use. Centered upon a patch of bottomland along the stream, with fields extending up the steep, poor hillsides, the typical farm is small, crowded, worked by intensive hand methods, and unproductive insofar as any net cash income is concerned. The farm provides a place to live, a source of food....⁵⁴

⁵²U.S. Department of Agriculture, Miscellaneous Publication No. 205, op. cit., p. 43.

⁵³U.S. Department of Agriculture, Technical Bulletin No. 576, op. cit., p. 21.

⁵⁴William A. Duerr, et al., Farms and Forests of Eastern Kentucky in Relation to Population and Income, Kentucky Agricultural Experiment Station, Bulletin 507 (Lexington: The University of Kentucky, August, 1947), p. 11.

The limited promise that such farms held was generally the most available alternative for those faced with the dismal industrial employment outlook for the 1930's. As a result, self-sufficing farms dominated the southern Appalachian's agriculture in the 1930's.⁵⁵ By Census definition, fifty percent or more of the total value of products produced on such farms was consumed by the farm family.⁵⁶ The Census also recognized abnormal farms, ninety percent of which were part-time operations, as non-commercial endeavors. Together, these two classes accounted for over 74 percent of the region's farms.⁵⁷ At the county level, they comprised 60 percent or more of the farming operations in 26 of the area's 31 counties (Figure V-5). The greatest concentration of these farms occurred in and around the coal-producing southeastern area. Kinship ties and the short range of migrations to mining centers accounted for much of the pattern. More than twenty percent of eastern Kentucky's miners were either born in an adjacent county or in the same county where they found work. Over half had been born within 100 miles of the mining towns they lived in.⁵⁸ Layoffs in industrial jobs outside the region also generated return migrations to the area's farms.⁵⁹

⁵⁵U.S. Department of Agriculture, Miscellaneous Publication No. 205, op. cit., p. 43.

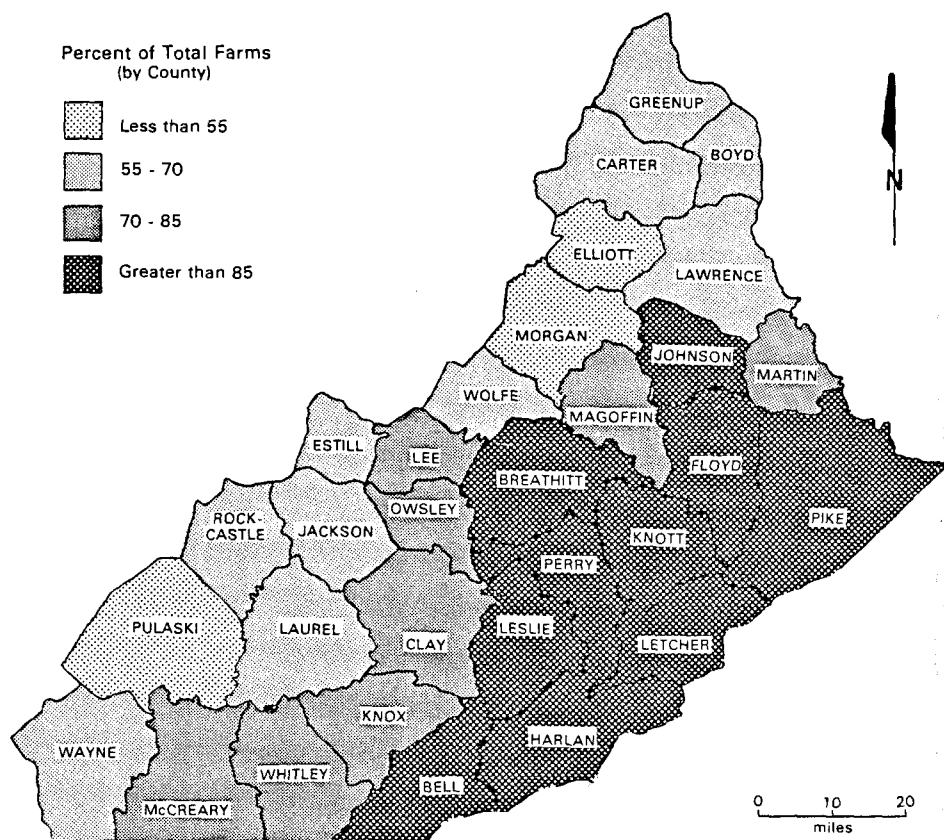
⁵⁶Ibid., p. 41.

⁵⁷U.S. Bureau of the Census, Census of Agriculture, 1930, pp. 505-513.

⁵⁸Morris, op. cit., pp. 16-17.

⁵⁹Breckenridge, op. cit., p. 423.

SUBSISTENCE AGRICULTURE, 1930 Self-Sufficing and Abnormal Farms



Source: U.S. Bureau of the Census, 15th Census, 1930, Vol. VIII, Part 2.

Figure V-5. Subsistence Agriculture, 1930
Self-Sufficing and Abnormal Farms.

The Structure of the Economy in 1930

Much of the region's economic structure was revealed in the composition of the labor force in 1930. In general, the primary sector was overdeveloped, secondary activity was underdeveloped, and the tertiary sector was poorly represented. Imbalances at the regional scale were markedly pronounced within the economic structures of individual counties. Primary activities were overwhelmingly prevalent throughout counties in the central part of the study area (Figure V-6). Except for mining, which provided jobs for twelve and fifteen percent of the labor forces in Knott and Martin counties, agriculture accounted for virtually all of the primary occupations in that area.⁶⁰ More than two-thirds of the employment in the east and southeast came from the primary sector. Coal mining made up one-third of the labor forces in Bell, Floyd, Perry, and Pike counties and more than half in Letcher and Harlan counties.⁶¹ Concentrations of mining employment also occurred in Knox, McCreary, and Whitley counties, in the south, but adjacent areas like Laurel, Pulaski, and Rockcastle relied more on agriculture. Forestry had ceased to become a significant job provider.⁶² The extraction of minerals other than coal was most important in Carter County where fire-clay used in brick and tile

⁶⁰U.S. Bureau of the Census, Census of Population, 1930, Table 20, pp. 937, 938, 942, and 943.

⁶¹Ibid.

⁶²Ibid.

DISTRIBUTION OF THE LABOR FORCE, 1930

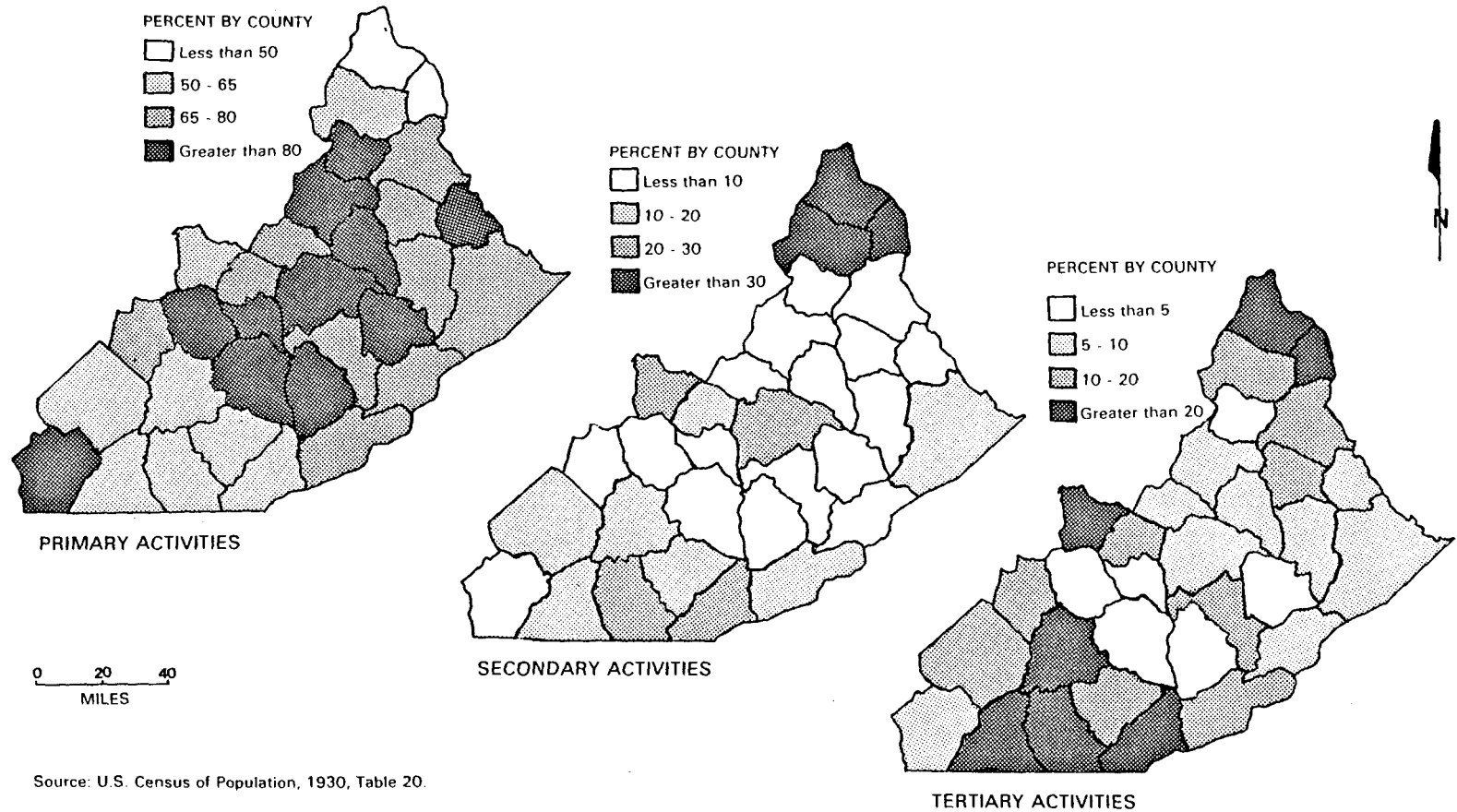


Figure V-6. Distribution of the Labor Force, 1930.

making was mined.⁶³ Elsewhere, some natural gas and oil were produced in Lee, Floyd, and Wolfe counties.⁶⁴ Only Greenup and Boyd counties had economies which featured less than fifty percent of the labor force engaged in primary activities.

Secondary activities were best developed in the north (Figure V-6). More than one-fifth of the labor force worked in manufacturing there. Clay and brick making in Carter County employed over 870, making it the most important manufacturing activity in the county.⁶⁵ Steel mills and rolling mills provided over 750 jobs in Greenup County. Over 2,500 worked at steel mills in Boyd County.⁶⁶ Heavy industry had expanded at Ashland in 1920 when Armco Steel opened a large rolling mill. Related industries included the North American Refractories Plant which made furnace linings and locomotive fire boxes, scrap iron yards, and a sizeable coke plant.⁶⁷ An additional 500 jobs were located in oil refineries and chemical plants.⁶⁸

⁶³Kentucky Geological Survey, "The Fire-Clays and Fire-Clay Industries of the Olive Hill and Ashland Districts of Eastern Kentucky" Reports, Fourth Series, Volume One, Part Two (Frankfort: The State Journal Co., 1913), pp. 592-623.

⁶⁴Davis, op. cit., pp. 127-131.

⁶⁵U.S. Bureau of the Census, Census of Population, 1930, Table 20, p. 937.

⁶⁶Ibid.

⁶⁷Federal Writer's Project, Kentucky: A Guide to the Bluegrass State (New York: Harcourt Brace and Company, 1937), pp. 143-144.

⁶⁸U.S. Bureau of the Census, Census of Population, 1930, Table 20, 937.

In other counties where ten percent or more of the work force was in manufacturing, sawmilling was important, as in Breathitt and Whitley counties. Clothing industries employed 400 in Bell County. In Estill County iron and steel rolling mills, associated with railway repair shops at Ravenna employed over 300.⁶⁹ Repair yards at Corbin created over 400 jobs in rolling mills in Whitley County.⁷⁰

Over most of the central part of the region, manufacturing involved less than five percent of the labor force, forming a pattern quite similar to that occupied by primary activities. Twentieth century economic development in these areas could be more correctly considered as a raw material boom rather than an industrial boom.

The tertiary sector was somewhat better developed, but was relatively absent in counties where agriculture dominated the economic base (Figure V-6). Towns in counties like Jackson, Owsley, Clay, Leslie, and Knott seldom held as many as 500 people and the rural settlement pattern further dispersed potential markets for services. Buying power in these areas was equally limited. Even in areas where tertiary employment was greater, many of the jobs were generated by maintenance and repair of railroads. All but seven counties reported employment in the railroad industry, which provided more than 9000 jobs, or just slightly less than the regional total for wholesaling and retailing.⁷¹

⁶⁹Ibid., p. 939.

⁷⁰Ibid., p. 949.

⁷¹Ibid., pp. 936-949.

Urban populations provided demands for services and trade in Harlan County at Lynch (7,000), Harlan (4,327), Cumberland (2,649), and Evarts (1,438); in Letcher County at Jenkins (8,465), McRoberts (6,000), and Whitesburg (1,804); in Pike County at Pikeville (3,376) and Hellier (2,112); in Floyd County at Prestonburg (2,105); in Perry County at Hazard (7,021) and in Bell County at Middlesboro (10,350). Towns of 500 or more were also located in proximity to these larger mining centers.⁷² An average of one-third of the tertiary employment in these counties was devoted to wholesale and retail trade. Hotel and restaurant workers as well as professional services were also concentrated in coal-producing areas.⁷³ In the urban industrial complex of Boyd and Greenup counties, services were well-developed in support of Ashland's 29,074 inhabitants and the 5,025 living in Catlettsburg.⁷⁴

Characteristics of the region's economic geography were mirrored in unemployment patterns brought on by the Depression (Figure V-7). Initially, counties with agriculturally based economies were least affected. Unemployment rates in these areas were less than one percent, well below the national rate of 8.8 percent, illustrating their position outside the mainstream of the national economy.⁷⁵

⁷²Federal Writer's Project, Kentucky: A Guide to the Bluegrass State, op. cit., pp. 143, 245, 387, 437, 439 and 441.

⁷³U.S. Bureau of the Census, Census of Population, 1930, Table 20.

⁷⁴U.S. Bureau of the Census, Census of Population, 1930, Table 5, p. 448.

⁷⁵Shannon, op. cit., p. 302.

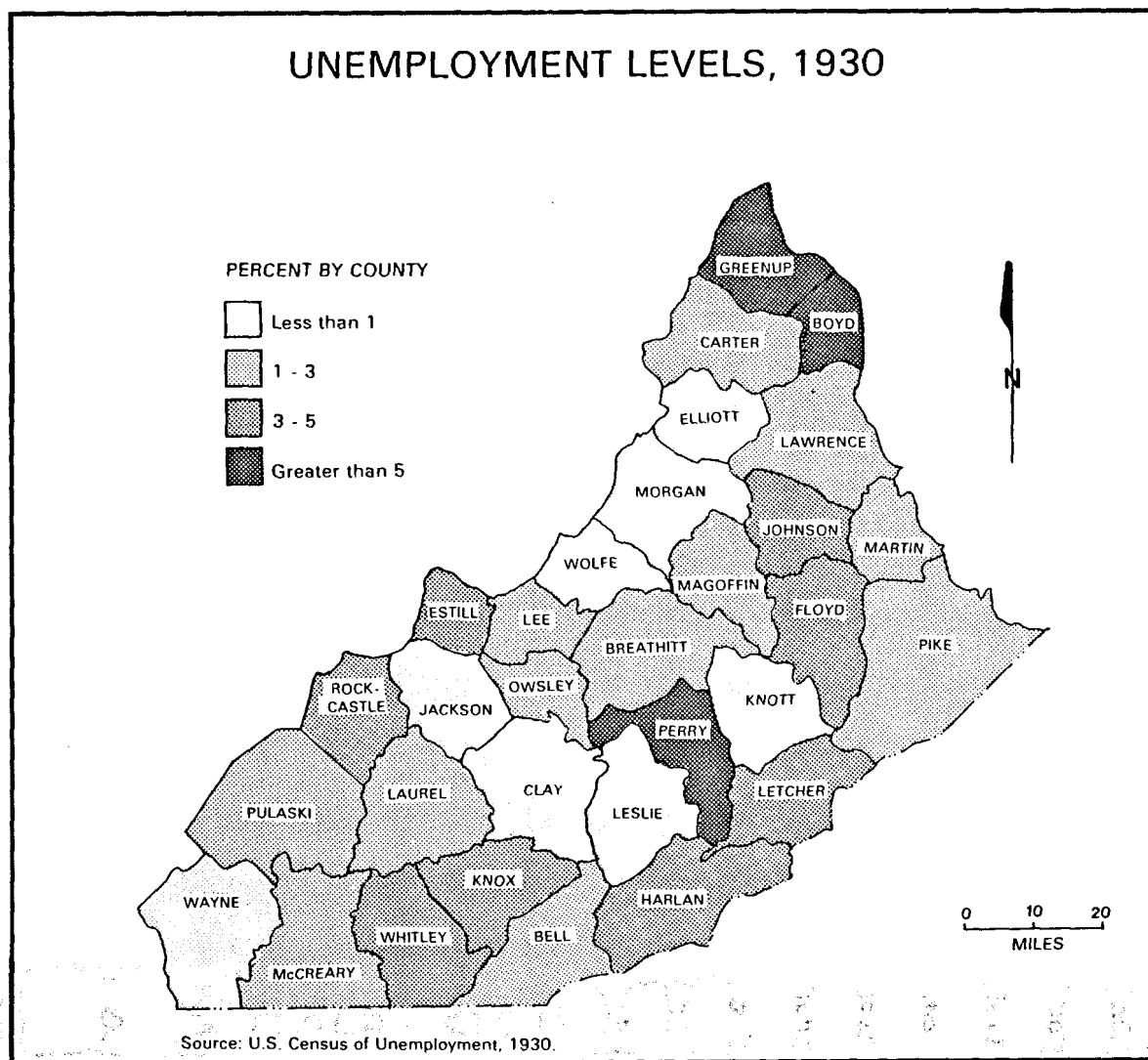


Figure V-7. Unemployment Levels, 1930.

Although something of an extreme example, Leslie County reported no unemployment and only one lay off in census schedules of 1930.⁷⁶ On the whole, these agrarian counties simply lacked industrial linkages which would have immediately tied them to the national industrial decline.

Mining areas were extremely more sensitive to national trends because of their production of metallurgical coal and development of captive mines by extra regional steel firms. Even here, the full weight of the Great Depression was not felt by the time that the census was taken, and not until the following spring did industrial collapse completely reach the coalfield. Mines in Harlan, Letcher, and Floyd counties actually ran for more days in 1930 than they had in 1927. Those owned by firms such as U.S. Steel, Bethlehem Steel, Inland Steel, and the Ford Motor Company maintained comparatively normal operations.⁷⁷ Although more layoffs would come in the winter of 1930-31, unemployment rates in the mining areas involved a substantially larger number of people than elsewhere because of the mining industry's sizeable labor force.

Boyd County, with its regionally unique manufacturing base, was the only county to experience rates above ten percent at this time.

⁷⁶U.S. Bureau of the Census, Unemployment in 1930, Table 10, pp. 403-405.

⁷⁷Kentucky Department of Mines, Annual Report for 1930 (Frankfort: The State Journal Company, 1931), pp. 54-62.

Reliance on steel and other heavy industries made Boyd County's economy more vulnerable to the effects suffered by industrial complexes across the nation.

Underemployment, existent in subsistence agriculture before the depression years, and return migration to rural farm counties spurred by unemployment, were both somewhat hidden in the 1930 unemployment returns. The effects of both came sharply into focus after the inception of federal relief programs as the Depression deepened. The incidence of relief recipients during the mid 1930's was particularly high in counties which had poorly balanced agricultural economies (Figure V-8). Proportionately heavy dependence on Federal assistance occurred in a pattern which suggests that mining areas fared somewhat better during the Great Depression. This concept strongly contradicts the notion that mining alone was to blame for poverty conditions.⁷⁸

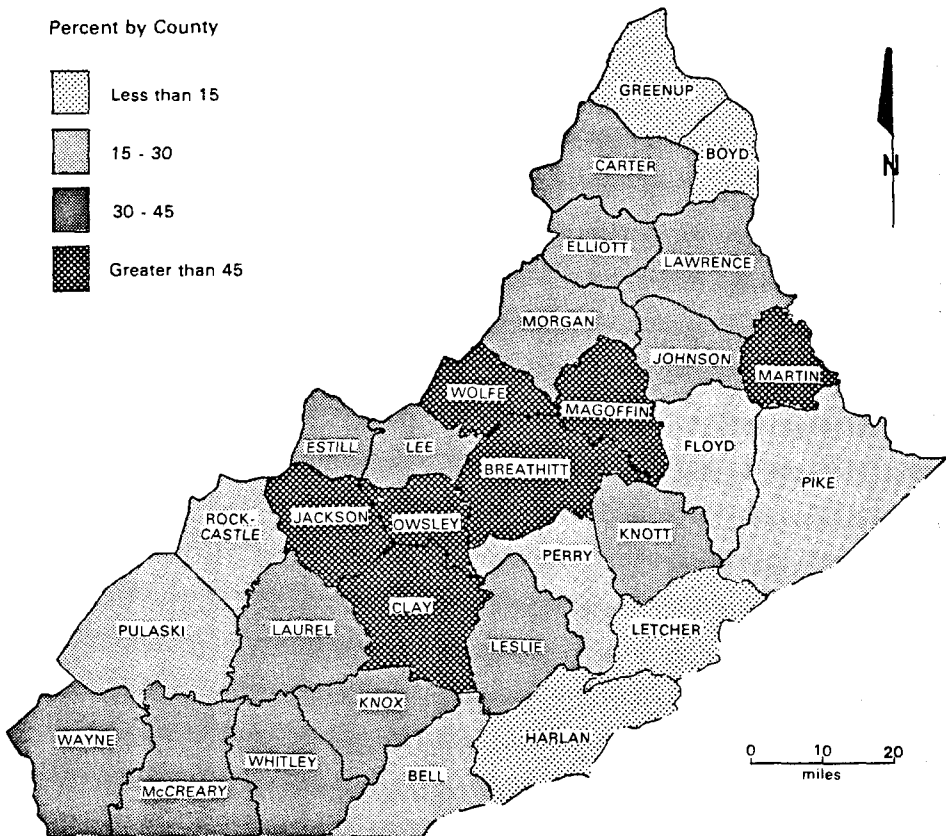
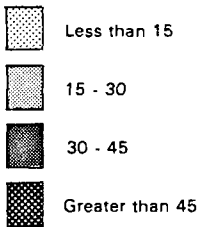
Summary

Industrial growth in the northern counties was overshadowed by developments in mining, which shifted toward the southeast during the 1920's. Growth slowed in the Depression years, but both industrialization and mining had accented inequities in regional patterns of economic development and settlement. Imbalances in employment opportunities had also been perpetuated with agriculture becoming so uneconomical that mining was the region's chief employment

⁷⁸ Goodrich, et al., op. cit., pp. 61-62.

FEDERAL RELIEF RECIPIENTS, 1934 - 1935 as a Percentage of 1930 Population

Percent by County



Source: Federal Works Agency, Work Projects Administration, *Final Statistical Report of the Federal Emergency Relief Administration*, Table XIV.

Figure V-8. Federal Relief Recipients, 1934-1935 as a Percentage of 1930 Population.

alternative. Population pressure resulting from high rates of natural increase was compounded by sizeable return migration and contributed heavily to the region's poverty. These conditions subsequently led to out-migration during the 1940-1970 period, an event which probably provided more relief than other developments of the twentieth century.

CHAPTER VI

CONCLUSIONS

Data presented in this study support the hypothesis that Appalachian Kentucky's nineteenth century commercial economic development was as significant as mining in shaping economic patterns of the 1930's. The study of the historical geography of the region's economic development to 1930 permitted the evaluation of widely-held views of the region's development. Specifically, these views suggest that the region was by-passed by national economic expansion during the middle of the nineteenth century and that twentieth century coal mining was almost solely responsible for the area's subsequent economic patterns.

Previous accounts of the region's development have given only general and thinly documented attention to commercial development which existed before mining became widespread. For example, geographic isolation is considered to have created a closed regional economy as early as 1850, causing the area to be by-passed as the national economy grew.¹ In a similar vein, Darrell Davis stated that pioneer conditions existed throughout the region until 1900.² More recently, Ronald Eller dated the beginning of the industrial period in the

¹Rothblatt, op. cit., p. 5.

²Davis, op. cit., p. 156.

southern Appalachians as 1880, considering earlier periods as pre-industrial and focusing on eastern Kentucky mainly after 1900.³

Harry Caudill, as well as White, Foscue, and McKnight, credited the coal industry with transforming a subsistence agricultural economy into an industrial economy during the twentieth century.⁴ Collectively, these views depict eastern Kentucky's commercial economic development as essentially a twentieth century phenomenon, created largely by mining. The economic landscape of the 1800's has generally been thought of as a rather homogeneous unit, isolated from outside commercial linkages, and almost wholly dominated by subsistence agriculture. This dissertation reveals that notable exceptions to these general statements exist and offers conclusions which refute or modify those ideas. This study concludes that the region's nineteenth century economy was: 1) spatially and structurally more complex than has previously been recognized, 2) not by-passed by national economic growth as early as previous research indicates, and, 3) characterized by some commercial agriculture rather than the subsistence stereotype presented in other works.

Supportive evidence for these conclusions can be seen in interregional economic variations which emerged by 1850, and were clearly defined by 1870. Two subregions, one that included Boyd, Greenup, and Carter counties in the northeast, and another, comprised of Estill County, on the northwestern fringe of the area, had distinctive economies based on charcoal iron production. These counties competed effectively in Midwestern and central Kentucky markets,

³Eller, op. cit., pp. 140-149.

⁴Caudill, op. cit., pp. x-xii; White, Foscue, and McKnight, op. cit., p. 207.

supplying foundries and shops in those areas with pig iron and bar iron for wrought iron articles, agricultural implements, and railway car wheels. Employment in the industry also provided local markets which promoted commercial agriculture in these subregions.

In the southwest, another subregion formed of Laurel, Pulaski, Rockcastle, and Wayne counties featured well-developed agricultural systems in addition to commercial-scale coal mining along a railway corridor. Even by 1850, this part of the region differed from the stereotype of a subsistence agricultural economy often mentioned in the literature. Livestock were driven to the Upland South and to the Bluegrass Basin and leather from local tanyards was shipped to outside markets as well. Processing and milling of agricultural products for local markets also contributed to the subregion's economic structure.

Counties in the central and southeastern parts of the area made up the Mountain Subregion, which most closely fit the closed subsistence economy considered typical of the region. Even here, extraregional marketing of salt took place in several counties as cured meat processing grew in the Ohio River Valley between 1830 and 1870.

Although their potential was somewhat limited, farms in this subregion produced enough to support local milling and processing. Livestock and tanned hides entered trade in the Bluegrass Basin and Ohio River towns. Outside contact was also established on a somewhat sporadic basis by coal shipments to central Kentucky and middle Tennessee.

As late as 1870, Appalachian Kentucky had shared in national economic expansion, rather than being by-passed to the degree indicated in previous research. The region had resources which supplied extra-regional demands at a time when the nation's transportation networks

encouraged localized manufacturing. For these reasons, eastern Kentucky had locational advantages which allowed it to compete effectively in markets in the lower Ohio River Valley. In 1870, the area's development was similar to that of other places which possessed raw materials necessary to manufacturing. The region's farming operations also differed little from those in other areas where agricultural specialization had not developed. At this point in its development, eastern Kentucky was probably more like many rural areas than it would later be and was certainly economically less homogeneous than previous studies have suggested.

Because of outside speculation and acquisition of timber and coal resources, the 1870's have been recognized as a critical period in the development of the southern Appalachian Region.⁵ The period was even more critical to eastern Kentucky because it was a time when the region's salt and iron industries declined in the face of competition from other areas. It was between 1870 and 1890 that eastern Kentucky's economy moved further from the mainstream of the national economy rather than in 1850, as claimed by other researchers. The national economy experienced rapid growth which featured remarkable railway expansion within and between the Midwest and Northeast. Livestock production and meat packing shifted westward, farther away from eastern Kentucky salt supplies,

⁵Eller, op. cit., pp. 44-58.

bringing an end to one of the region's oldest industries. Charcoal iron became technologically and economically inferior to iron smelted with anthracite and coke, resulting in the collapse of Estill County's industry, as well as much of that in the Northeastern Subregion.

Economic growth north of the Ohio River provided expanding markets but increased accessibility to higher quality Lake Superior iron ore and markets greatly weakened locational advantages previously held by Appalachian Kentucky iron makers.

As markets were lost to more accessible agricultural and industrial areas during the last three decades of the century, eastern Kentucky's economy grew but slowly, reflecting the speculation and piecemeal development of coal reserves. Mining activity was focused in the southern parts of the region as railroads slowly extended into the more valuable coal and timber lands. The region shifted from being a producer of manufactured goods to being a raw material supplier for northern-based industries. Coal production emerged as the one activity in which the region could effectively compete on a national scale. That competitive ability, however, depended on outside decision-making, demand, and railway penetration into the coalfields.

Patterns of nineteenth century economic activities were, in many respects, a model of future economic development in eastern Kentucky. Marked contrasts between developed and undeveloped areas were persistent. By the late 1800's the decline of iron production in Estill County and salt production in Clay County, as well as a decline in early coal production left places with only vestiges of their former economic activities. Agriculture was the primary alternative to dependence on exhaustible resources. The limited potential of the area's

farms was apparent, yet agriculture was the mainstay in the economy of many counties. This was especially true of the central part of the area. Economically these counties changed little between the 1800's and 1900's, a feature documented in scholarly publications during the late nineteenth and early twentieth century.⁶ In fact, these observations from the central part of the area seem to have formed much of the basis for the pioneer-subsistence economy treated as a stereotype in the literature. This generalization has been erroneously applied to the rest of the region as well. To the contrary, conditions in these counties provide further evidence of diversity within the nineteenth century economy. Benefits of resource development did not accrue to the entire region in the 1800's, nor would they in the following century.

The evaluation of economic development during the twentieth century yields two important conclusions: 1) the industrial transformation that coal brought to an agrarian economy was only valid for certain areas and at certain times, and, 2) economic patterns continued to develop unevenly, as they had in the nineteenth century. Between 1890 and 1920, the region's economic growth continued to be closely linked with railway expansion, but wartime demands stimulated coal production and secured national markets for eastern Kentucky coal. Commercial-scale mining was concentrated in the south in Bell and Whitley counties by 1890 and diffused eastward to Letcher, Harlan, Perry, and Pike counties by 1912. During that time, production declined in older areas such as Knox and Laurel counties, resulting in spatial shifts over the region.

⁶ Semple, op. cit., pp. 588-623; Vincent, op. cit., pp. 1-20.

Marked concentrations, rather than a broad regional dependence on mining, were typical. By 1920, for example, mining was the chief economic enterprise in only ten of the region's thirty one counties. The coal industry's greatest impacts were confined to the southeastern part of the area and comments concerning the transformation from an agrarian to an industrial economy were more appropriate here than elsewhere. Interpretations of the development of southeastern Kentucky, however, have commonly been taken as representative of the entire region. From that context, the regional importance of coal mining has been over emphasized.

Economic and social conditions in coal-producing counties were poor, but contrary to popular opinion, equally bad and often worse circumstances prevailed in adjacent counties. A greater percentage of the population of these counties relied on federal relief programs during the 1930's than did those in coal producing areas. These areas had undergone relatively less economic change over time, relying heavily on agriculture. Population growth had been continuous in most of these counties, in spite of limited economic opportunities. Population pressure and dependence on agriculture had negative impacts that were equally severe or perhaps worse than those of mining. Each of these forces created concentrations of poverty during the 1930's and had been operative during the nineteenth century.

Although coal producing areas experienced more dramatic changes in population and settlement patterns than before, formative elements of nineteenth century patterns continued to persist. Twentieth century patterns of economic growth continued to cluster near resources, with agriculturally-based economies comprising much of the development

elsewhere in the region. Significant spatial shifts in development had occurred, but disparities common to the nineteenth century economy remained. The early appearance and persistence of complex subregional economic patterns supports the hypothesis of this study.

Appalachian Kentucky did not develop as a unified economic entity. Extraregional demands generated patterns of growth which were both spatially and temporally fragmented. The more complex character of the region's economic development has been masked by generalization in previous discussions of the area. Eller, in dating the beginning of industrialization in the southern Appalachians at 1880, missed the point that northern parts of eastern Kentucky became industrialized earlier while the southeastern area experienced economic growth somewhat later. Rothblatt and White, Foscue, and McKnight greatly oversimplified economic diversity by focusing on the persistence of pioneer subsistence conditions. Caudill, Semple, and Vincent misrepresented development by forming stereotypes based on impressions from limited areas and applying them to the entire region. A clearer understanding and documentation of Appalachia's economic development may be achieved if caution is used when interpreting conventional assessments of the region's development.

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