THE REPORT OF THE IRON RANGE HISTORICAL-CULTURAL SURVEY

(OCT. 1, 1978 - SEP. 30, 1979)

PREPARED

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MINNESOTA HISTORICAL SOCIETY
STATE HISTORIC PRESERVATION OFFICE

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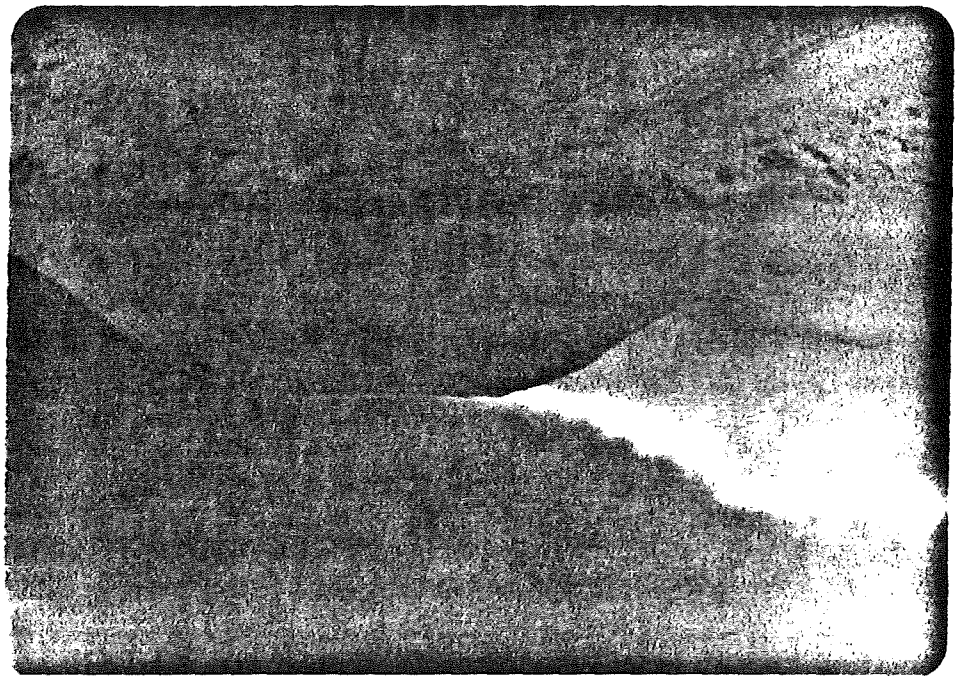


Introduction

The Historical-Cultural Survey of the Iron Range is a cooperative venture sponsored by the State Historic Preservation Office, Minnesota Historical Society, and the Interpretative Program, Iron Range Resource and Rehabilitation Board (IRRRB), an agency of the State of Minnesota headquartered in Eveleth, Minnesota. The survey was conducted in the period October 1, 1978 through September 30, 1979, with a fulltime staff of two persons, six parttime persons, and a budget of $40,000.00. The survey had three primary objectives, which reflect the interests of the cooperating sponsors as well as the skills and approach of the primary contractor. One major objective was the development of an inventory of historic resources (an historic resource being a building, structure, site, object, or combination of two or more of these) located in the Iron Range area. Another primary objective was the selection and nomination of appropriate historic resources to the National Register of Historic Places. The IRRRB had major interest in the historic resource inventory because it required the data for the development of the various local and

regional programs that would benefit from the systematic collection of the data. The State Historic Preservation Office, SHPO, had major interest in the selection and nomination of selected resources to the National Register because of its responsibility for coordinating the statewide program of National Register nomination. There were, of course, overlapping areas of interest but these were the major tendencies. A third major objective was the development of a systematic analysis of Iron Range history which was to serve as the basis for the derivation of selective criteria for the historic resource inventory as well as for the resources subsequently nominated to the National Register. The survey accomplished these three objectives within the allotted time and budget in spite of severe inflation and other difficulties. The purpose of this report is to present the work of the survey and its major findings in a coherent format. The report is organized into three parts in pursuit of that end. Part one is the historical analysis of the Iron Range, part two is supporting data and materials, and part three is the Historic Resource Inventory of the Iron Range along with the list of those resources nominated to the National Register of Historic Places.

It should be stated at the outset that the Iron Range survey differs from other historic preservation surveys in both conceptualization and method. The crucial aspect of its differentness is the survey's studied avoidance of the architectural significance of structures as a primary criterion for selection as an historic resource and the elitist social history bias that an architectural approach explicitly entails. Instead of concentrating upon the intrinsic qualities of structured things, the Iron Range survey concentrates upon the

people who used these facilities and attempts to understand how they used them and why they used them in the manner that they did. Also, the survey attempts to delineate how these patterns of use and interaction persisted or changed over time. The Iron Range survey, therefore, derived its criteria for designating a resource as historically significant from the relationship of resources to the historical patterns of behavior of the population of the region. The purpose of the historic resource inventory is, then, to reflect the history of the region through the selection and preservation of representative structures and sites. The purpose of the list of proposed nominations to the National Register is the same, but it is smaller than the inventory in order to avoid duplication and in order to meet the requirements of physical integrity set by the National Register system.

The relationship between the historical analysis of the Iron Range and the designation of historic resources is not taxonomical. That is, the sites are not selected by some comparative points system or some such similar method. The sites are selected as physical representations of certain, important, often basic and vital human and social processes reflected in the historic behavior of the regional population. The relationship between the historic resources and the historical analysis is explanatory rather than taxonomical.

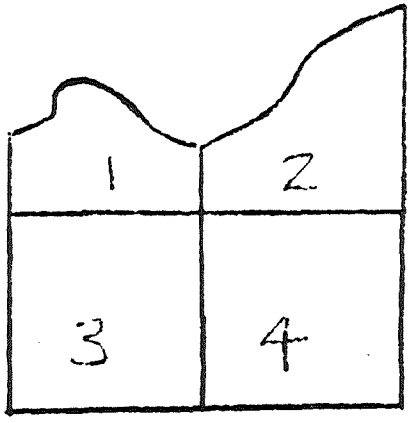
In order to analyze Iron Range history and to delineate the patterns of historic resource development and use, data was drawn from three sources, each of equal importance for the success of the survey. These three sources were, one, the existing literature relevant to the Iron Range and various aspects of its history, two, the historical record of the region including census data, mining records, town histories,

newspapers, ethnic organizations, church records, and myriad others, and, three, the people living in the region and their oral and written testimony. These sources of data were tapped by the survey with two separate research efforts working in tandem. The primary effort was conducted in the Iron Range area itself and was coordinated by the survey director. The local effort was conducted within the Iron Range and was the primary responsibility of the survey research associate, Catherine Rukavina. Mrs. Rukavina, a longtime Range resident and professional local historian, established contact with the historical organizations on the Range, and through them, collected historical data relative to the various Range communities and sought information from local residents and their appraisal of local historic resources. The local and regional historical organizations that cooperated with the survey included the Iron Range Historical Society, the Hibbing Area Historical Society, the Virginia Area Historical Society, the Itasca County Historical Society, the Ely-Winton Historical Society, the Tower-Soudan Historical Society, the Cuyuna Range Historical Society, and the Minnesota Mining Museum in Chisholm. The cooperation extended to the survey by these organizations made meaningful local involvement in the survey possible. Such cooperation and involvement was deemed essential to the success of the survey from the very beginning.

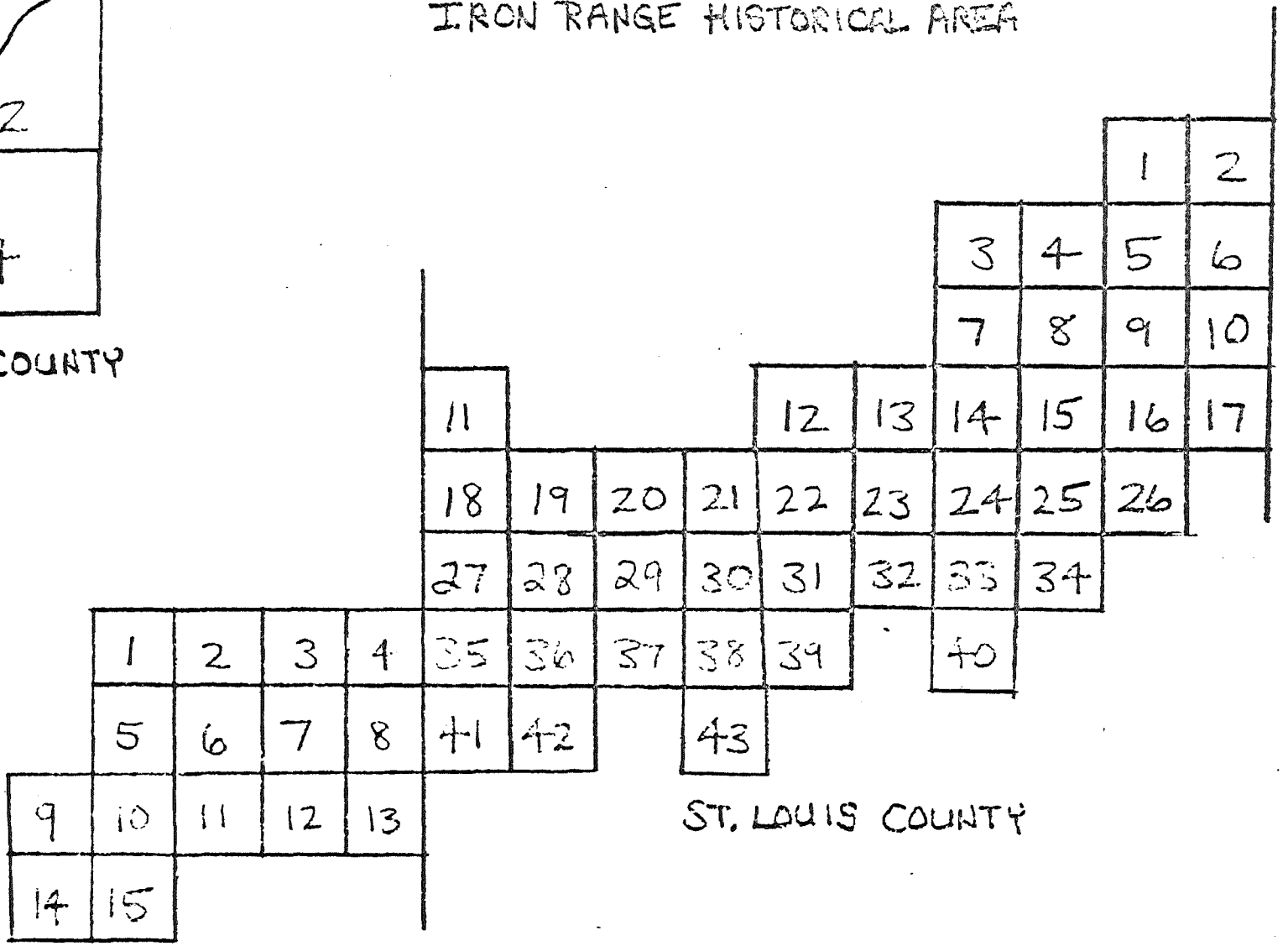
The other research effort mounted by the survey was conducted with the assistance of professional historians with access to the historical research resources in the Twin Cities metropolitan area. With the construction of the Iron Range Research Library in Chisholm it should be noted that similar future research efforts may be able to be carried out on the Iron Range itself if the facility can avail itself of the necessary

resources. The research effort in the Twin Cities consumed only about ten percent of the survey's resources, but its theoretical import goes far beyond what this proportion suggests. The thrust of the research effort was to examine the Iron Range area as a distinct historical region in order to identify and delineate the patterns at work in its historical development. This regional research effort was directed by Professor Russell Menard, Department of History, University of Minnesota. Menard and his assistants developed a tentative model of the dynamics of Iron Range economic change and population development and they speculated on the key points of transition and change in these areas of historical activity. Utilizing neoclassical economic theory and established demographic methods of aggregate estimation they accumulated hypotheses, albeit crude and very general ones, about the relationships between crucial variables that seemed to get at the essence of the historical processes unfolding in the region. With this theoretical analysis proceeeding and the development of a tentative model completed it was possible to integrate the tentative conclusions with the accumulating local data being assembled by Rukavina, into the framework of a regional analysis. The single most crucial contribution of Menard and his associates was the testing and confirmation of the concept of the Iron Range area,as originally suggested and defined by the director of the survey, as a viable unit of analysis utilizing regional population and iron mining industry indicators. While the original definition of the Iron Range area was refined as work progressed and the Minnesota ranges came to be viewed as part of the Lake Superior ranges generally, the original definition retained its essential features. The Iron Range Historical area, as defined by the survey, is presented as Map #1 on page 6, with townships as the basic units of identification.

MAP #1 ADMINI' TRATIVE AREA FOR IRON RANGE HISTORICAL AREA



CROW WING COUNTY



ST. LOUIS COUNTY

ITASCA COUNTY

NORTH

Township Key to Map #1

Crow Wing County

1. Wolford
2. Rabbit Lake
3. Irondale
4. Deerwood

Itasca County

1. Wabana
2. Lawrence
3,4. Nashwauk
5. Arbo
6. Iron Range
7. Greenway
8. Lone Pine
9. Bass Brook
10. Grand Rapids
11. Trout Lake
12. Unorganized
13. Goodland
14. Unorganized
15. Harris

St. Louis County

1,2,5,6. Morse
3,4. Breitung
7. Kugler
8,10. Unorganized
11. French
12. Sandy
13. Pike
14. Embarrass
15. Waasa
16,17,26. Babbitt
18. Unorganized
19,28. Balkan
20,29. Great Scott
21,30. Mountain Iron
22. Wouri
23. Unorganized
19,28. Balkan
20,29. Great Scott
21,30. Mountain Iron
22. Wouri
23. Unorganized
24,33,40. White
25,34. Hoyt Lakes
27,35,36,41,42. Stuntz
37. Cherry
38. Clinton
39. Fayal
43. McDavitt

With the systematic historical analysis of the Iron Range developed from these two sources in hand, it was relatively simple to apply the analysis to the problem of development of an inventory of historic resources. It was learned that the growth of the Iron Range, measured in terms of population and productivity, was a function of the process of exploitation of the iron resources of the region by the iron mining industry and of the various rate changes and transitions in that process. On the qualitative side, it was adduced that the social and cultural development of the Iron Range population was an indirect function of the iron mining industry as the Range peoples struggled to live and prosper within the confines of that economy. With these two central adductions in hand, it was possible to develop the criteria for designating resources as historically significant. Any resource that reflected a quantitatively significant change in the degree or rate of exploitation of the iron resources by the iron mining industry was, consequently, deemed historically significant. Likewise, any resources that reflected qualitatively significant changes in the social and cultural organization of the population in the region or significant segments of it were also deemed historically significant. The historic resources reflect these two criteria in one way or another and the National Register nominations reflect their total trends for the period 1880 through 1970.

The application of these criteria and methods to the Iron Range was facilitated by the absence of major economic influences aside from iron mining in the area. Lumbering was an important activity, for example, at one time or another in various parts of the Range. In comparison to iron mining, however, in terms of number of jobs created, the number of people owing their livelihood or support to it over time, and the total dollar impact upon the regional economy, lumbering was a negligible factor in Iron

Range development. Agriculture was also practiced on the Range in various places, at various times, and it too was a negligible factor in overall development of the Range. Because of climate and soil the optimal yields expected from agricultural activity in northern St. Louis County were low and if iron miners frequently farmed it was to supplement incomes and not generate them totally. Tourism, especially since World War II, has grown in economic importance for northeastern Minnesota, but even this growing industry cannot compare in aggregate effect to that of mining. The decisive impact of iron mining upon the region and its population is, therefore, easy to measure with some precision because there are few other industries and because those that there are have such relatively small impact and very negligible multiplier effects. These industries are also included in the inventory of historic resources, but they are somewhat different from the rest in that they are important because of their relative insignificance rather than their relative importance. The overwhelming influence of mining upon the Iron Range is the key to the history of the area and is the key to the survey structure. It is also the key to the historical significance of the entire region for it is with this pervasive aspect of Iron range life that its inhabitants have coped for the past century.

While the experience of the economic and historic development of the Iron Range is something unique in Minnesota history, the historic preservation analysis applied to it, the Range, could be profitably applied to other areas of the state that are characterized by agriculture and urban/industrial systems of development. The advantages of this analysis are mainly realized in the definition of units of analysis and the resulting freedom from the constraints of boundaries of civil divisions

such as counties, cities, and small towns. In many counties in the state, such as St. Louis or even Hennepin, there are admixtures of primary development processes that present formidable problems for historic preservation surveyors. Unfortunately, on a county-by-county basis of surveying, the patterns of development are obscured rather than brought to light so that much research is duplicated and there is no cumulative effect of the data collected and the work employed. In agricultural areas of the state, it might be more profitable for surveyors to look at areas where crop mix and size of producing units are relatively similar than for these same surveyors to look at separate counties in the area. The development of agricultural structures in such regions should be similar because of the similarity of product being developed and because there should be a relatively close continuity of settlement. The different skill levels of the people who moved into the various regions of agricultural development could then be examined to explain different adaptations of structures to the same area and to the same types of farming and animal husbandry. Such differences may also stem from longer periods of prior association with the type of agricultural activity practiced in the region. The potential of this type of analysis for rural, agrarian areas is simply mindboggling. Although they present problems of scale, the urban/industrial centers in Minnesota are also amenable to such analysis.

It is important, however, that historic preservation surveys understand the history of the areas they are attempting to delineate and preserve. In the opinion of this surveyor current efforts at historic preservation in the United States are plagued by concentration upon the effort to preserve without a coincidental effort to understand what ought to be preserved. The emphasis upon architecture, and the aesthetic criteria of that profession, has served as a stopgap in the

absence of a systematic theory of preservation that puts history back into historic preservation. Unfortunately, the aesthetic criteria of architecture and the systematic study of architectural styles through architectural history provide us with an incomplete view of the past. To reiterate, the central problem of the approach is that architectural history concentrates upon the buildings and their qualities rather than the people who used them. The Historical-Cultural Survey of the Iron Range has not provided instant remedies for all these difficulties, but we on the survey would argue that we have taken a modest and halting step in the right direction.

Joseph Stipanovich, Director
Iron Range Historical-Cultural Survey
Minneapolis, September 1979

PART I

THE HISTORICAL ANALYSIS OF THE IRON RANGE

The historical analysis of the Iron Range is divided into four parts. Part one explicates the growth of the mining industry in the United States, 1850 through 1970. Part two deals with workers in the industry and their wages in the period 1850-1970. Part three looks at the population processes on the Iron Range from 1880 through 1970. Part four ties these somewhat loose strands together into an analysis of the Iron Range social order and how social and cultural relations have developed on the Iron Range in the light of the economic and demographic realities.

SECTION I

THE PATTERNS OF GROWTH IN THE UNITED STATES IRON MINING INDUSTRY, 1850 - 1970

The iron mining industry of the United States, spurred by rapid industrialization, grew at impressive rates in the late nineteenth and early twentieth centuries. Ore production, just under a million tons in 1860, reached 25 million tons by the turn of the century and peaked at 75 million on the eve of U.S. entry into World War I (see Appendix A, Table A-5). A sharp rise in the work force accompanied this growth of output: in 1850, U.S. iron mines employed only 2195 wage earners, a figure that reached 30,000 in 1880, 39,000 in 1902, and peaked at just over 60,000 in 1917 (see Appendix B, Table B-2). Several other indicators - the gross value of the product, the amount of capital employed in iron mines, the horse power rating of the equipment used, and the total wage bill - confirm the impression that these years were a major expansive period in the iron mining indsutry of the

United States (see Table 1).

Iron ore production stagnated in the late 1910s and throughout the 1920s, fluctuating in most years between 60 and 70 million tons, and then collapsed during the early 1930s as the nation entered the Great Depression, reaching a low of just under 10 million tons in 1932. The work force declined sharply. The 60,000 plus wage earners employed in 1917 fell by half, to just over 30,000 in 1928, and by half again, to slightly fewer than 15,000 by 1935, its twentieth century nadir. Other indicators - the value of product, wage bill, and horse power - also describe a pattern of stagnation followed by decline (see Table 2).

The iron mining industry began a recovery after 1932. Ore production climbed steadily, despite a severe setback in 1938, nearly reaching the pre-World War I peak in 1940. Fueled by heavy wartime demand, output rose to new heights surpassing 100 million tons in both 1942 and 1943. Production fell off with war's end, but immediately recovered and began to grow again, reaching a new high of nearly 118 million tons in 1953. Output fell off in the late 1950s and then recovered before settling into a gentle fluctuation between 80 and 90 million tons between 1964 and 1970. The work force, while not keeping pace with gains in output, more than doubled between 1935 and 1943, fell and then recovered in the late 1940s and early 1950s, and peaked at just over 34,000 workers in 1951, its highest level since 1927. The number of wage earners then began a fairly steady decline, reaching a low of just over 17,000 workers in 1970.

The growth path of the iron ore mining industry in the Lake Superior District generally, and on the Minnesota ranges in particular, largely paralleled, indeed to a large extent determined, that in the

Table 1. Indexes of Growth in the Iron Mining Industry of the United States, 1850-1970.

Year	Ore production[a]	Wage Earners	Total Capital[b]	Value of Product[b]	Total Horse Power[c]	Wage Bill[b]
1850	-	2195	1.0	1.3	-	0.6
1860	909	3177	2.1	2.2	-	0.9
1870	3395	15022	11.4	7.7	8889	4.7
1880	7120	30415	47.2	18.1	28422	8.9
1889	14518	36341	85.8	36.3	57976	14.9
1902	35567	38851	201.5	93.6	119558	23.4
1909	51718	47245	213.3	161.6	345534	28.1
1919	61173	45741	215.2	220.4	370869	34.9

a - thousands of gross tons

b - millions of 1860 dollars

c - total horsepower rating of equipment

Sources: Joseph M. Perry, The Impact of Immigration Upon Three American Indsutries 1865 - 1914 (New York: 1978), 130, 132; Eighth Census of the United States: 1860; Manufactures, III, p. clxxvii; Ninth Census of the United States: 1870, Wealth and Industry, III, p. 768; Sixteenth Census of the United States: 1940, Mineral Industries, 1939, p. 321.

Table 2. Indexes of Growth in the Iron Ore Mining Industry of the United States, 1850 - 1970.

Year	Ore Production[a]	Wage Earners	Value/Product[b]	Horsepower[c]	Wage Bill[b]
1919	61173	47741	108.0	370869	37.5
1929	73963	28516	142.0	489821	29.4
1935	31008	14873	65.6	-	12.5
1939	51645	20137	133.5	573296	24.1

a - Thousands of gross tons.

b - Millions of 1910-1914 dollars.

c - Total horsepower rating of equipment.

Source: Sixteenth Census of the United States: 1940; Mineral Industries, 1939, p. 321.

United States as a whole. First opened in the late 1840s, the iron mines of the Marquette Range shipped 114 thousand tons in 1860, less than 4% of the total for the United States as a whole. By the early 1870s, shipments were hovering around one million tons, more than 20% of U.S. production. In 1890, by which time the Lake Superior district had expanded to include the Menominee, Gogebic, and Vermilion Ranges, shipments reached nine million tons, 56% of the U.S. total. Lake Superior ore production continued to grow rapidly around the turn of the century, receiving a considerable boost with the opening of the Mesabi Range in the early 1890s. In 1890, 19 million tons were shipped from Lake Superior mines, 70% of the U.S. total; in 1910, 44 million, 76% of the total. In 1916, the district reached its pre-World War II peak shipping 67 million tons, fully 86% of the ore shipped by U.S. mines in that year (see Appendix A, Tables A-1, A-5).

As was the case with the U.S. iron mining industry which it now dominated, ore production in the Lake Superior region stagnated in the late 1910s and the 1920s, fluctuating in most years between 45 million and 65 million tons maintaining its share at about 85% of the national total. It retained this dominant position until the present, as fluctuations in its production continued to shape the growth of iron mining in the United States during the middle decades of the twentieth century. Beginning in the early 1950s, however, its share of total production declined, falling to just over 76% of U.S. output by 1963 (see Appendix A, Tables A-1, A-5, A-6).

Just as the Lake Superior district dominated iron mining in the United States, the Minnesota Ranges, especially the Mesabi,

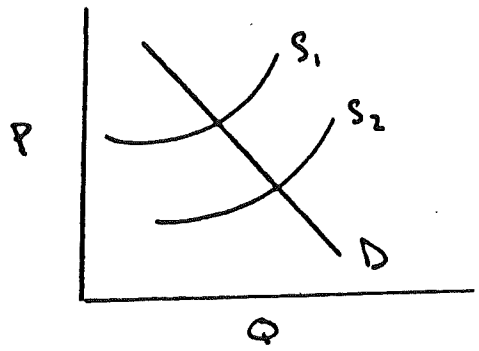
quickly became dominant in the Lake region. Ore shipments from Minnesota's Vermilion Range began in 1884 and grew steadily for the remainder of the decade, approaching one million tons, roughly 10% of the Lake District ores and 5% of U.S. production by 1890. The pace of the expansion quickened in the 1890s with the opening of the Mesabi Range. In 1900, 9.5. million tons were shipped from Minnesota's iron mines (7.8 million from the Measbi), half the product of the Lake District and more than one third of the ore shipped from all U.S. mines. Minnesota's share of the industry continued to expand rapidly in the early twentieth century: in 1910 it accounted for 70% of the Lake Superior region's production and more than half that of the U.S. Minnesota's share remained fairly constant until the early 1930s and then began to increase steadily in the recovery from the Great Depression. In 1940, Minnesota produced 76% of the Lake district's ore and 65% of the nation's, figures that had risen to 96% and 81% by 1950. In that year the Mesabi alone, long the dominant force in Minnesota iron mining industry, shipped over 60 million tons of ore, nearly two-thirds of the total output of U.S. mines (see Appendix A, Table A-3).

Describing the pattern of growth in iron mining is a straightforward process, identifying its dynamics more complex. We can make a beginning, however, by examining price changes from 1855 to 1970. Several price series are available and are presented in the appendices to this section. Two of these, the Lake Erie dock prices for old range and Mesabi non-Bessemer ores (the several series seem to move in unison - these were chosen because their temporal scope was longest) have been converted into constant (1910-1914) dollars by use of a wholesale price index (see Appendix A, Tables A-7, A-8, A-9). Despite violent year-to-year fluctuations some definite longterm

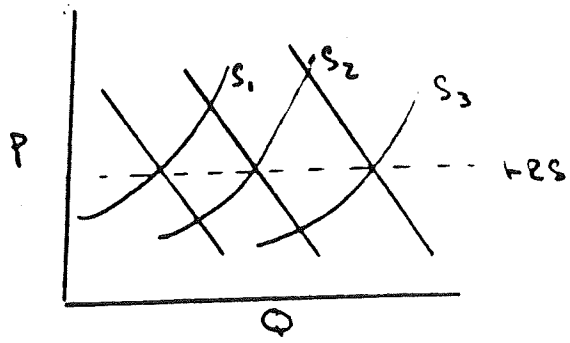
trends are apparent. Prices fell steeply in the late 1850s, fluctuated wildly but revealed no long-term tendency to rise or fall from the early 1860s to the early 1890s, and then fell steadily from the early 1890s to World War I. Prices were fairly stable during the 1920s, although there was a severe slump in the middle of the decade, jumped sharply in the 1930s, and then fell fairly steadily to the late 1940s. The price of iron ore rose sharply from the late 1940s to the late 1950s before beginning a gentle decline that continued at least until 1970.

Combining this data with that on production suggests that we have six distinct periods with which to contend: 1) an initial period very brief, lasting to about 1860 during which prices fell and production increased; 2) a longer period stretching from 1860 to 1890 during which prices remained stable over the longrun while output expanded; 3) another period, although much longer than the first, from 1890 to about 1920, during which prices fell and output rose; 4) a decade, the 1920s, during which output stagnated and prices were stable; 5) a period of rising production and falling prices from 1932 to 1947; and 6) a final era of fairly steep price increases and generally stable output. Preliminary and very tentative suggestions of the relationships between supply and demand which joined to produce these movements in price and production in each of the periods are hypothesized in Figure 1. Let us take up each of the periods in turn, offering, as we proceed, what seem the most likely explanations of the changing process of growth in the iron ore mining industry of the United States.

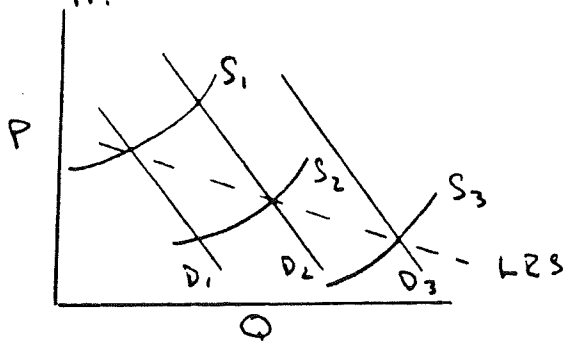
The initial period is poorly documented and it is difficult to root firmly in the evidence an explanation of falling prices and rising production during the 1850s and 1860s. Prices, however,



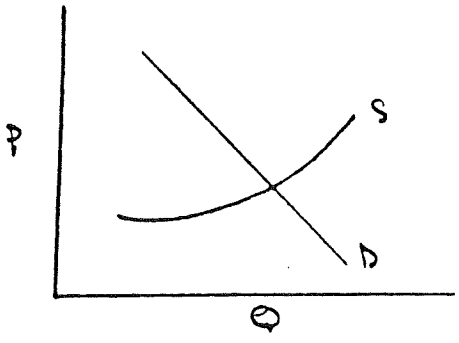
A. 1850-1860



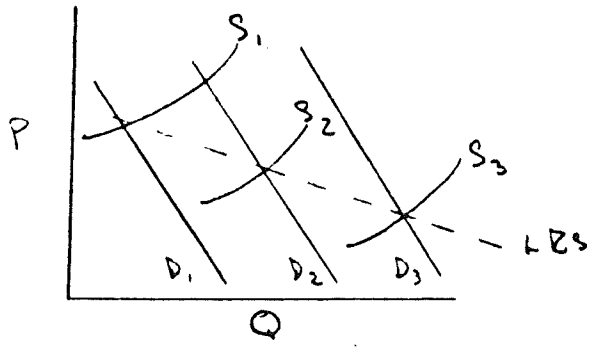
B. 1860-1890



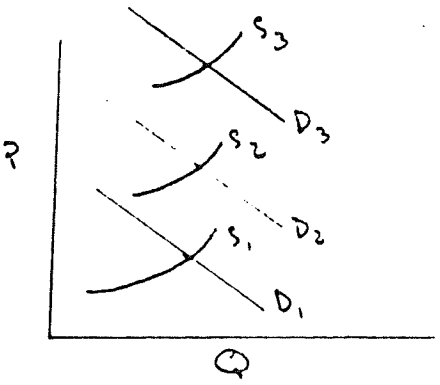
C. 1890-1917



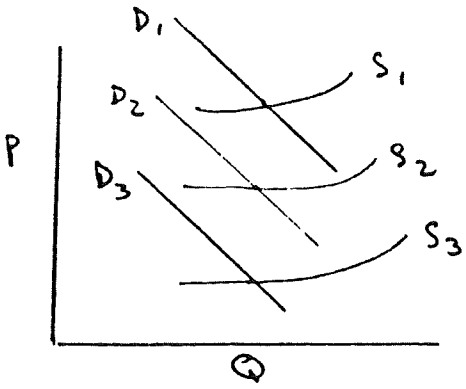
D. 1918-1930



E. 1931-1947



F. 1948-1960

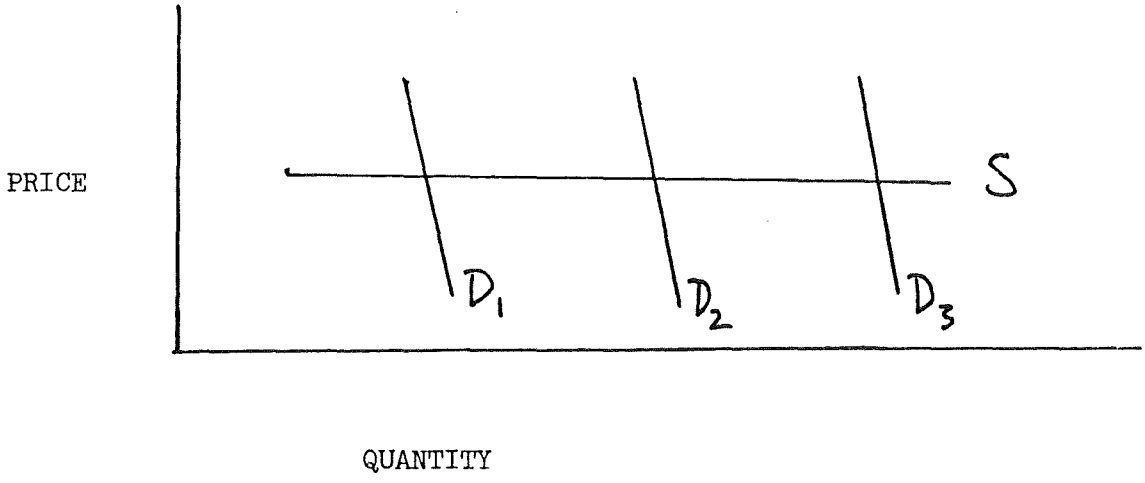


G. 1860-

Figure 1. The Growth Process in U.S. Iron Ore Mining, 1850-1970.

are only available for the ore produced at the recently opened Marquette mines and may not reflect trends in the industry as a whole. If that is the case we can attribute the pattern to the initial high cost of opening a new region to exploitation and to subsequent rapid fall in those costs as the mines were brought into full production. Graphically, we can conceptualize this as a shift in the supply curve down and to the right across a constant demand curve as in panel A of Figure 1. It is important to remember that this may represent a purely local situation and that, were price data available for the indsutry as a whole, the dsitinction between the first and second of our periods might disappear.

During the second period, the thirty years from 1860 to 1890, output increased roughly 15-fold, while ore prices, despite sharp, short term movement, remained steady over the long run. One's first impulse on examining these data is to argue for a perfectly elastic, long run supply curve across which demand steadily increased, a process made possible by the seemingly inexhaustible supply of rich and readily accessible ores available in the several mining districts, as illustrated below:



However, inspection of the data in Table 3 suggests that this was not the case. In the first place, there was substantial growth in capital intensity in iron mining, as the series on capital and horsepower per wage earner indicate. Second, and despite the growth of capital, ore production per worker actually declined from 1860 to 1870 and remained low to 1880 before jumping sharply to 1889. Third, the period was characterized by the frequent opening of new ranges in the Lake Superior District: the Menominee in 1877, the Gogebic and Vermilion in 1884, and the Mayville and Mesabi in 1892. This process involved substantial initial outlays and higher transportation costs. On the whole, one gets the impression that the iron ore mining industry ran very fast and barely managed to stay in place during this period. Rapidly rising demand forced operators to expand production of existing ranges where they quickly reached capacity and encountered rising costs. They met each bottleneck with some technological innovations but largely with the successful exploitation of new ranges where high quality ore still could be captured with relative ease. Thus, in place of a single and perfectly elastic supply curve we should substitute a series of sharply rising supply curves with the industry jumping from one to the next as increasing demand pushed against existing capacity. The process is illustrated in Panel B of Figure 1, in which a series of sharply rising shortterm supply curves sum to produce a perfectly elastic long run supply. Incidentally, when combined with sharp, shortterm fluctuations in demand, for our purposes exogenous, such a conception is adequate to account for the violence of the annual price movements. Further, it is consistent with the hypothesis advanced above, in the discussion of the 1850s. By this argument, the opening of the Marquette

Table 3. Input and Output Indexes, U.S. Iron Mining Industry, 1850-1970.

Year	Ore Production/ Wage Earner [a]	Capital/ Wage Earner [b]	Horsepower/ Wage Earner [c]
1850	-	468	-
1860	286	661	-
1870	226	759	0.6
1880	234	1552	0.9
1889	399	2361	1.6
1902	915	5254	3.1
1909	1095	4515	7.3
1919	1337	4705	8.1
1929	2594	-	17.5
1935	2085	-	-
1939	2565	-	28.5
1950	3154	-	-
1960	3223	-	-
1970	4209	-	-

a - long tons per wage earner.

b - 1860 dollars per wage earner.

c - total horsepower rating of equipment/wage earners.

Sources: Tables 1 & 2; U.S. Bureau of the Census, Historical Statistics of the United States, Colonial Times to 1970 (Washington, D.C.: 1975), p. 599.

mines, like the development of subsequent Lake Superior ranges, was a response to a strain on existing deposits which temporarily raised the price of iron ore high enough to absorb the substantial costs of putting a new region into production.

During the third period, stretching from 1890 to World War I, output increased fivefold, from about 15 million tons to nearly 70 million, while prices fell by about half. As Table 3 shows, these years were marked by a sharp increase in ore production per worker, which rose from about 400 tons in 1889 to more than 1300 tons in 1919. While much of this gain reflects an increased capital intensity, the price decline indicates that real productivity advances played a major role in the process. Before 1890, demand for more ore was met largely by the development of new deposits; between 1890 and 1920 the demand was met largely by exploiting known deposits with new and more effective techniques. The major source of the productivity gains was the rise of open cut mining on the Mesabi Range. Open pit mines were a negligible source of ore in 1890, but accounted for nearly half of total production by 1909 (see Appendix A, Table A-5). Simply put, open pit mining was much more productive than underground methods. Output per manhour was about three times higher in open cut operations during the early twentieth century, while the total cost of extracting a ton of ore was lower by a factor of nearly 2.5 (see Table 4).[1] Thus, leaving aside technological changes in either mining method, a rise in the proportion of ore obtained from open pits would in itself lead to major advances in productivity. Mining methods were not constant, however, but also showed significant technological advance. In open pit mines these centered on the power shovel, which became larger, faster, and more flexible.

Table 4. Costs of Mining by Method: Lake Superior District, 1909 (in constant dollars)

Average expenses per ton mined	Open pit Mines	Underground Mines
1. Salaries	0.03	0.09
2. Wages	0.22	0.87
3. Supplies & Materials	0.12	0.40
4. Royalties and Rent	0.24	0.34
5. Taxes	0.07	0.07
6. Contract Work	0.06	0.04
7. Other	0.03	0.06
Total	0.77	1.86

Source: Thirteenth Census of the United States, 1910: Mines and Quarries, 1909, p. 256.

Underground mines, perhaps spurred by competition from open cut methods, also captured major productivity gains as a result of increased mechanization, improvements in tools, and the development of new mining methods which used gravity for breaking and loading ore, thus sharply reducing the amount of drilling and blasting.[2] Early in the period, steam power played a major, transforming role in mining, but electrification spread rapidly in the years just prior to World War I, and, by 1919, electric motors accounted for roughly 40% of the total horsepower used in the iron mines.[3] The growth process during these years is summarized in Panel C of Figure 1, which shows a steady improvement in supply interacting with growing demand to produce lower prices and increased output.

One of the major changes accompanying the rapid expansion of the years between 1890 and 1920 was a sharp increase in the concentration of the mining industry (see Table 5). Between 1860 and 1880, the number of firms nearly kept pace with the growth of mining output but, beginning in the 1880s, large corporations began to dominate, driving out small, owner-operated concerns. Nowhere was this growing concentration more evident than in the Lake Superior District, and particularly in Minnesota. In 1919, according to the Census Bureau,[4]

> 38 enterprises, or 13.1 percent of the total, had products valued at over $1,000,000 each and reported 73 percent of the total value of the products of the industry. Thirty-three of these 38 enterprises were in the Lake Superior Region and the value of their products, averaging between $4,000,000 and $5,000,000 each, amounted to 76.7 per cent of the total value of the products of the region and 68 percent of the value of the products of the United States.

Three factors would seem to account for this growth in concentration: the integration of mining into the iron and steel industry, apparently stemming from a desire of steel producers to control the supply and

Table 5. Concentration in U.S. Iron Mining, 1850 - 1919

Year	Number of Enterprises	Workers per Enterprise	Capital per Enterprise	Ore Production per Enterprise
1850	197	11.1	.005	-
1860	157	20.2	.013	5.8
1870	420	35.8	.027	8.1
1880	805	37.8	.059	8.8
1889	592	61.4	.145	24.5
1902	332	117.0	.607	107.1
1909	300	157.5	.711	172.4
1919	290	157.7	.742	210.9

a - millions of 1860 dollars.

b - thousands of gross tons.

Source: See Table 1.

the quality of iron ore; the changing technology of mining, which increased the capital requirements and the optimum size of establishments; and the high costs of developing new mining sites, especially when - as was the case in Minnesota - these were far from existing transport facilities and mine operators had to build their own means of getting ore from mine to factory.[5]

The great expansive period in U.S. iron ore mining ended with the First World War, to be followed by a decade of stagnating output and stable prices. In part this was a result of a failure of demand to increase, a failure exogenous to our argument but which can be accounted for in large part by three factors: a substitution of steel for cast and wrought iron; economies in the steel industry's use of raw materials; and the substitution of scrap for pig iron in steelmaking.[6] More important for our purposes, there is evidence that mine operators were encountering increased costs. True, there was a substantial increase in output per worker between 1919 and 1929 (a gain that allowed operators to cut the work force in half while maintaining production levels), but this was more a function - as the doubling of the horse power/wage earner ratio indicates - of a substitution of capital for labor than of real gains in productivity. During the 1920s, high quality ores apparently became less accessible, forcing open cut operations to remove more overburden and work out of deeper pits and underground mines to sharply increase their vertical depth (between 1916 and 1937 the average maximum vertical depth of underground mines in the Lake Superior region increased from 854 to 1511 feet), thus greatly intensifying the problems - and the costs - of drainage, ventilation, transport of men, equipment and ores,

support of rock strata, and so forth, associated with deep mining.[7] Further, the quality of ore captured by these more costly techniques seems to have declined somewhat during the period, as the increase in the proportion beneficiated - from 10% just before World War I to 16% in 1930 - suggests (see Appendix A, Table A-5). The increased difficulties of capturing high quality ore washed out any gains in productivity that the substitution of capital for labor might otherwise have won. Indeed, these difficulties might have acted as the principle incentive for technical innovation as operators struggled to maintain income in the face of rising costs and a stagnant demand for their product, a process resulting in an industry in equilibrium, as described in Panel D of Figure 1.

The fifth period, from 1932 to 1947, during which output rose while the price of ore fell, need not long detain us. In large part, the process simply involved putting existing mines back into full production, thus permitting more efficient operation as various scale economies were recaptured. There were also important productivity gains during this period, a result not so much of changes in technique as of a continued growth in the share of all mining carried out in open pits, which accounted for more than 90% of all ore production by 1947. This process more than offset the further decline in the quality of the ore as evidenced by the increased proportion beneficiated, 20% to 25% by the late 1940s (see Appendix A, Table A-5). On the whole, the fifth period closely resembled the third, as rapidly increasing demand, fueled first by the recovery from depression, later by the needs of war, joined with improvements in supply to produce another expansive era in U.S. iron mining. The process is illustrated graphically in Panel E of Figure 1.

In the sixth and final period, 1948 to 1960, the iron mining indsutry, as it had in the 1920s, again encountered severe difficulties imposed by the declining quality of the available resources, although this time it proved impossible to prevent costs from rising by shifting to a greater use of open cut methods (by 1947, more than 90% of all U.S. output of ore was mined from pits), or by technological innovations. This is not to argue that there were no major technological improvements in mining methods during the 1950s, but only that those were not sufficient to compensate for the increased costs imposed by the severe decline in the quality and accessability of the basic resource, as the stability of ore production per worker reported in Table 3 attests. The decline in accessability is amply illustrated by the ratio of useable ore produced to total ore mined in the Lake Superior District, which fell from .86 in 1949 to .48 in 1963, the decline in quality by the increased proportion of ore that required beneficiation, from 24% to 78% over the same years (see Appendix A, Tables A-5, A-6). The result, illustrated in Panel F of Figure 1, was a steady deterioration in supply which joined with growing demand to produce the price and production trends of the period. These pressures, the impact of declining resources on costs, it could be argued, are the source of the incentive for the taconite revolution,[8] an innovation which dramatically transformed iron ore mining on the Mesabi and which led to major productivity advances - ore production per worker increased by 30% in the 1960s (see Table 3) - that have permitted operators to slowly reduce prices while maintaining output since the early 1960s and thus to contain the impact of declining demand for iron ores on the industry (see Panel G, Figure 1).

Notes for Section 1.

1. Harold Barger and Sam H. Schurr, The Mining Industries, 1899-1939: A Study of Output, Employment and Productivity (New York: 1944), p. 217.

2. Ibid., chapters 5-7, 11.

3. Fourteenth Census of the United States: 1920. Mines and Quarries., p. 350.

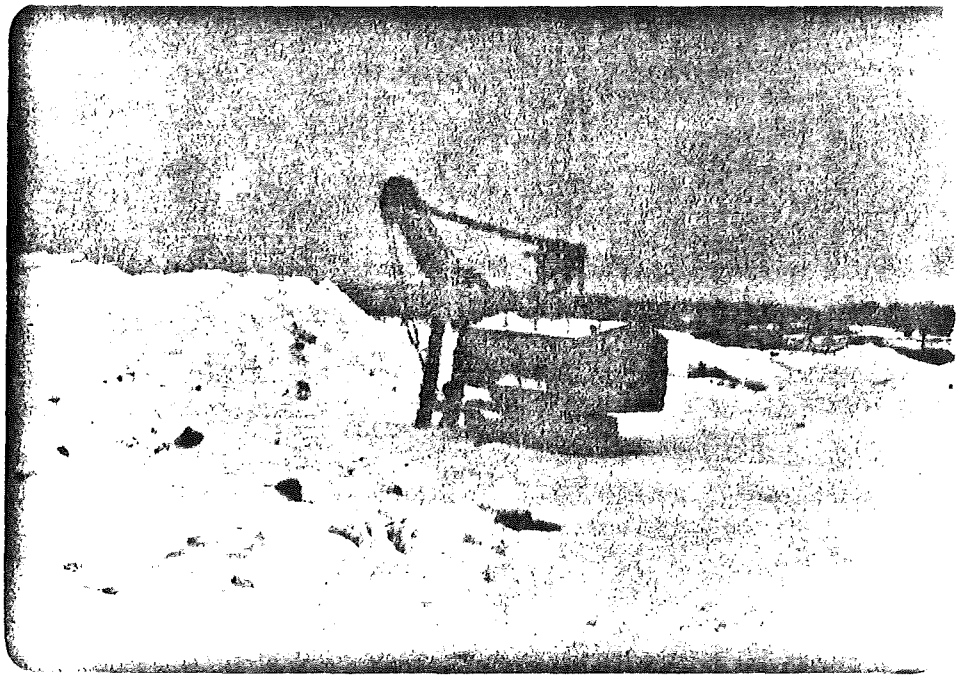
4. Ibid., p. 340.

5. G. O. Virtue, "The Minnesota Iron Ranges," U.S. Department of Labor, Bulletin #84 (1909), p. 339-343.

6. Barger and Schurr, p. 21-24.

7. Ibid., 213-216; Nicholas Yaworski, et al., Iron Mining.

8. See Clarence W. Nelson, "Some Aspects of Investment in Iron Mining Facilities in the Lake Superior District", Ph.D. Dissertation, University of Minnesota, 1967.



APPENDIX A

Extensive tables relative to iron ore shipments, iron ore production, beneficiation, prices, price index, employees, and wages, relative to discussion in Section I.

Table A-1. Annual Shipments of Iron Ore, Lake Superior Ranges, 1849-1951, In Thousands of Gross Tons.

Year	Shipment	Year	Shipment
		1904	21977
1849-53*	74*	1905	34575
1854	3	1906	38689
1855	1	1907	42402
1856	7	1908	26166
1857	26	1909	42782
1858	23	1910	43630
1859	69	1911	32957
1860	114	1912	48308
1861	50	1913	50117
1862	124	1914	32949
1863	203	1915	47635
1864	247	1916	66903
1865	199	1917	64695
1866	297	1918	63025
1867	466	1919	48721
1868	507	1920	60533
1869	649	1921	22852
1870	856	1922	44015
1871	819	1923	60798
1872	949	1924	43896
1873	1175	1925	55535
1874	936	1926	55970
1875	899	1927	52334
1876	995	1928	54856
1877	1024	1929	66157
1878	1122	1930	47188
1879	1383	1931	23496
1880	1945	1932	3589
1881	2319	1933	21672
1882	3000	1934	22064
1883	2384	1935	28503
1884	2517	1936	45251
1885	2468	1937	63219
1886	3577	1938	19550
1887	4765	1939	45548
1888	5064	1940	64310
1889	7273	1941	81211
1890	9011	1942	93495
1891	7073	1943	86413
1892	7081	1944	82356
1893	6075	1945	76890
1894	7760	1946	61028
1895	10441	1947	79685
1896	9951	1948	84693
1897	12974	1949	70991
1898	14038	1950	82186
1899	18244	1951	96999
1900	19168		
1901	20850	*Estimate.	
1902	27885		
1903	24530		

Source: Lake Superior Iron Ore Association, Lake Superior Iron Ores: Mining Directory (2d Ed.Cleveland: 1952), 276-277.

Table A-2. Annual Shipments of Iron Ore: Michigan and Wisconsin Ranges, 1849-1951 In Thousands of Gross Tons.

Year	Marquette	Menominee	Gogebic	Mayville	Baraboo	Total
1849-53	74*					
1854	3					3
1855	1					1
1856	7					7
1857	26					26
1858	23					23
1859	69					69
1860	114					114
1861	50					50
1862	124					124
1863	203					203
1864	247					247
1865	199					199
1866	297					297
1867	466					466
1868	507					507
1869	649					649
1870	856					856
1871	819					819
1872	949					949
1873	1175					1175
1874	936					936
1875	899					899
1876	995					995
1877	1013	10				1024
1878	1039	83				1122
1879	1135	247				1383
1880	1384	561				1945
1881	1580	739				2319
1882	1829	1171				3000
1883	1305	1079				2384
1884	1558	896	1			2455
1885	1430	693	120			2243
1886	1627	892	753			3273
1887	1851	1196	1323			4370
1888	1924	1191	1437			4552
1889	2643	1797	1988			6428
1890	3001	2282	2848			8131
1891	2512	1825	1842			6178
1892	2665	2261	2973	9		7909
1893	1837	1466	1329	8		4641
1894	2060	1138	1809	11		5018
1895	2094	1924	2548	16		6582
1896	2607	1560	1800	13		5980
1897	2713	1937	2258	11		6919
1898	3119	2522	2498	18		8158
1899	3738	3301	2799	20		9858
1900	3479	3261	2877	21		9638
1901	3247	3619	2938	22		9826
1902	3865	4613	3659	30		12167
1903	3040	3750	2939	28		9756

Table A-2. Annual Shipments of Iron Ore: Michigan and Wisconsin Ranges, 1849-1951 In Thousands of Gross Tons.

Year	Marquette	Menominee	Gogebic	Mayville	Baraboo	Total
1904	2852	3075	2399	46	48	8420
1905	4236	4495	3706	61	71	12569
1906	4057	5110	3642	77	67	12954
1907	4388	4965	3633	24	72	13082
1908	2414	2679	2700	71	51	7915
1909	4253	4875	4088	83		13299
1910	4393	4238	4316	92		13038
1911	2836	3911	2603	116		9466
1912	4203	4711	5006	104		14025
1913	3968	4967	4532	145		13612
1914	2492	3222	3569	106		9388
1915	4106	4983	5478	81		14648
1916	5410	6365	8490	126	93	20483
1917	4874	6046	7980	94	43	19036
1918	4354	6379	7937	89	9	18768
1919	2992	4447	6230	93		13761
1920	4608	6569	8763	79	51	20070
1921	1117	1584	2337	52		5090
1922	2818	4079	6221	87	23	13229
1923	3892	4855	6580	112	27	15466
1924	3175	3837	5160	99	36	12307
1925	4198	5270	7068	106	51	16693
1926	4435	5946	7537	132		18050
1927	4148	5213	6386	93		15839
1928	4299	4842	6540	7		15688
1929	5410	5645	7642			18679
1930	3634	3609	5064			12307
1931	1809	1469	2908			6187
1932	357	308	673			1338
1933	2807	1511	2401			6719
1934	2474	1335	2287			6096
1935	3266	1634	3071			7970
1936	4628	2164	4630			11422
1937	5748	2649	5661			14058
1938	1476	980	2278			4734
1939	4908	2161	5346			12414
1940	5920	3103	5976			15000
1941	6254	4131	6301			16687
1942	6541	4930	6238			17709
1943	5601	4903	5487			15991
1944	4790	4876	5604			15271
1945	4585	4241	4304			13130
1946	3270	2590	3717			9578
1947	5543	3668	5253			14464
1948	4898	4094	5384			14376
1949	4253	3587	4562			12403
1950	4955	4144	5529			14628
1951	5647	4708	5064			15419

*Estimate. Source: Lake Superior Iron Ore Association, Lake Superior Iron Ores: Mining Directory and Statistical Record of the Lake Superior Iron Ore District of the U.S. and Canada (2d Ed.Cleveland: 1902), p. 276-277.

Table A-3. Annual Iron Ore Shipments, Minnesota Iron Ranges, 1884-1951, In Thousands of Gross Tons, With Spring Valley in Total.

Year	Vermilion	Mesabi	Cuyuna	Total
1884	62			
1885	225			
1886	304			
1887	394			
1888	512			
1889	845			
1890	880			
1891	895			
1892	1168	4		1172
1893	821	614		1434
1894	949	1793		2742
1895	1078	2782		3859
1896	1088	2882		3970
1897	1278	4277		5555
1898	1265	4614		5880
1899	1772	6614		8386
1900	1656	7810		9465
1901	1786	9005		10791
1902	2084	13331		15415
1903	1677	12894		14571
1904	1283	12157		13439
1905	1677	20159		21837
1906	1793	23821		25613
1907	1685	27492		29177
1908	842	17258		18100
1909	1109	28178		29287
1910	1203	29200		30404
1911	1089	22099	148	23336
1912	1845	32045	305	34196
1913	1567	34040	733	36340
1914	1017	21468	868	23352
1915	1734	29757	1128	32619
1916	1947	42526	1716	46190
1917	1531	41441	2422	45394
1918	1193	40399	2479	44069
1919	929	32004	1859	34792
1920	1007	37150	2192	40347
1921	869	16350	490	17709
1922	1212	28064	1496	30772
1923	1279	41806	2221	45306
1924	978	29142	1469	31589
1925	1438	35890	1514	38842
1926	1586	38251	2083	41920
1927	1548	32976	1982	36505
1928	1671	35399	2098	39168
1929	1874	43008	2596	47478
1930	1885	31067	1929	34881
1931	1141	15270	898	17309
1932	217	1935	99	2250
1933	740	13472	741	14953
1934	785	14650	533	15968
1935	857	18877	798	20533

Table A-3. Annual Iron Ore Shipments, Minnesota Iron Ranges, 1884-1951, In Thousands of Gross Tons, With Spring Valley in Total.

Year	Vermilion	Mesabi	Cuyuna	Total
1936	1064	31459	1305	33829
1937	1453	45933	1775	49161
1938	930	13304	582	14816
1939	1417	30315	1291	33023
1940	1547	45668	1734	48949
1941	1847	59773	2441	64061
1942	1925	70280	3036	75300
1943	1779	64906	3066	69971
1944	1539	62509	2538	66586
1945	1446	58369	3016	62831
1946	1330	46326	2354	50010
1947	1430	59079	2860	63517
1948	1560	64047	3149	69109
1949	1300	52694	2730	56826
1950	1651	60134	3225	65332
1951	1787	73315	3514	79069

Source: Lake Superior Iron Ore Association, Lake Superior Iron Ores: Mining Directory and Statistical Record of the Lake Superior Iron Ore District of the United States and Canada (2d Ed. Cleveland: 1952), p. 276-277.

Table A-5. U.S. Iron Ore Production, 1860-1970, In Thousands of Long Tons.

Date	Shipments	Beneficiated Amount	Beneficiated %	Mining Method Underground	Mining Method Open Pit	Percentage From Lake Superior District
1860	2873					4.0
1870	3832					22.9
1875	4018					22.4
1880	7120					27.3
1885	7600					32.5
1890	16036					56.2
1895	15958					65.4
1900	27300					70.2
1905	42400					81.5
1909	51294			27567	24150	
1914	39714	4130	10.4			
1915	55493	5581		33365	22161	85.8
1920	69281	8515	12.3	34940	32664	87.4
1925	63925	8736	13.7	31937	29971	86.9
1930	55201	8974	16.2	29417	28976	85.5
1935	33426	6067	18.2	12613	17927	85.3
1940	75198	12426	17.2	24105	49591	85.5
1945	88137	19587	22.2	27377	78935	87.3
1950	97764	26718	27.3	28872	96868	84.1
1955	106258	36182	34.0	27623	114706	78.4
1960	82963	46012	55.5	19716	135179	86.5
1965	84073	64667	76.9	17586	160355	76.3
1970	87176	79779	91.5	13209	199252	

Notes: 1860-1913, iron ore produced is used as a proxy for shipments. The data under mining methods reports production and, beginning in 1942, represents mine production of crude iron ore before treatment for waste removal. The two columns labeled percent use the data in the column headed "Shipments" as the denominator.

Source: Table A-1; US Bureau of the Census, Historical Statistics of the United States: Colonial Times to Present, Bicentennial Edition, Part 2 (Washington, D.C.: GPO, 1975), Series M 205-207, 212-213, p. 599-600.

Table A-6. Crude and Useable Ore Production, Lake Superior District, 1949-1963 In Thousands of Long Tons.

Year	Crude Ore Mined	Unuseable Ore Produced	% Useable
1949	79306	68494	86.4
1950	96561	79637	
1951	115846	93947	
1952	94933	77095	
1953	120425	95655	
1954	80725	60994	
1955	109118	83255	76.3
1956	110050	77817	
1957	122768	83530	
1958	84445	51777	
1959	74081	43950	
1960	125082	71792	57.4
1961	105505	53207	
1962	111829	55556	
1963	117314	56132	47.8

Source: Mineral Facts and Problems, US Bureau of Mines, Bulletin 630 (Washington, DC: GPO, 1965), p. 468.

Table A-7. Iron Ore Prices, 1855-1970. Current Dollars Per Long Ton.

Year	Old Range Bessemer	Mesabi Bessemer	Old Range Non-Bessemer	Mesabi Non-Bessemer	High Phos.	U.S. Avg. L.Ton
1855	10.00		10.00			
1860	5.25		5.50			
1865	7.50		7.50			
1870	8.50		8.50			
1875	7.00		5.50			
1880	9.25		8.00			
1885	4.75		4.00			
1889	4.75		4.50			2.30
1895	2.90	2.15	2.25	1.90		1.14
1900	5.50	4.50	4.25	4.00		2.42
1905	3.75	3.50	3.20	3.00		1.77
1910	5.00	4.75	4.20	4.00		2.47
1915	3.75	3.45	3.00	2.80		1.83
1920	7.45	7.20	6.70	6.55	6.35	4.11
1925	4.55	4.40	4.40	4.25	4.15	2.52
1930	4.80	4.65	4.65	4.50	4.40	2.64
1935	4.80	4.65	4.65	4.50	4.40	2.48
1940	4.75	4.60	4.60	4.45	4.35	2.51
1945	4.95	4.70	4.80	4.55	4.55	2.77
1950	8.10	7.85	7.95	7.70	7.70	4.99
1955	(11.44)	11.21	(11.29)	(11.06)		7.12
1960	11.85	11.60	11.70	11.45		8.73
1963	11.05	10.80	10.90	10.65		9.22
1970						10.80

Notes: Series A through E are base prices of Lake Superior Iron Ores at Lake Erie ports. For the years 1855-1925, 1940-1950, they are drawn from the Lake Superior Iron Ore Assn. Directory (1952). For the years 1930-1935, they are from Mineral Facts. Prices in parentheses are averages for those years.

Table A-8. All Commodity Wholesale Price Index, United States, 1855-1970. (1910-1914 = 100).

Year	Index	Year	Index	Year	Index
1855	110	1906	91	1957	264
1856	105	1907	95	1958	268
1857	111	1908	92	1959	268
1858	93	1909	99	1960	269
1859	95	1910	103	1961	268
1860	93	1911	95	1962	268
1861	89	1912	101	1963	268
1862	104	1913	102	1964	268
1863	133	1914	100	1965	274
1864	193	1915	101	1966	283
1865	185	1916	125	1967	283
1866	174	1917	172	1968	290
1867	162	1918	192	1969	302
1868	158	1919	202	1970	313
1869	151	1920	225		
1870	135	1921	142		
1871	130	1922	141		
1872	136	1923	147		
1873	133	1924	143		
1874	126	1925	151		
1875	118	1926	146		
1876	110	1927	140		
1877	106	1928	142		
1878	91	1929	139		
1879	90	1930	126		
1880	100	1931	106		
1881	103	1932	95		
1882	108	1933	96		
1883	101	1934	109		
1884	93	1935	117		
1885	85	1936	118		
1886	82	1937	126		
1887	85	1938	115		
1888	86	1939	113		
1889	81	1940	115		
1890	82	1941	128		
1891	82	1942	144		
1892	76	1943	151		
1893	78	1944	152		
1894	70	1945	155		
1895	71	1946	176		
1896	68	1947	217		
1897	68	1948	234		
1898	71	1949	223		
1899	72	1950	232		
1900	82	1951	258		
1901	81	1952	251		
1902	86	1953	248		
1903	87	1954	248		
1904	87	1955	249		
1905	88	1956	257		

Note: This series splices together the Warren-Pearson All-commodity wholesale price index for 1855 to 1890 with that of the Bureau of Labor Statistics for 1890 to 1970. The data are reported in the U.S. Bureau of the Census, Historical Statistics of the United States Colonial Times to 1970, Bicentennial Edition, Part 2 (Washington, D.C.: GPO, 1975), Series E 23 and E 52, p. 199, 201.

Table A-9. Non-Bessemer Iron Ore Prices, 1855-1970, Constant (1910-1914) Dollars per Long Ton.

Year	Old Range	Mesabi
1855	9.09	
1856	7.62	
1858	6.99	
1859	6.31	
1860	5.91	
1861	5.62	
1862	5.16	
1863	5.63	
1864	4.40	
1865	4.05	
1866	5.46	
1867	4.94	
1868	5.22	
1869	6.29	
1870	6.29	
1871	6.15	
1872	5.51	
1873	6.77	
1874	5.56	
1875	4.66	
1876	4.09	
1877	4.01	
1878	4.67	
1879	4.02	
1880	8.00	
1881	6.80	
1882	5.79	
1883	4.70	
1884	4.83	
1885	4.70	
1886	5.49	
1887	5.88	
1888	4.65	
1889	5.55	
1890	6.40	
1891	5.18	
1892	4.80	
1893	4.10	
1894	3.57	2.50
1895	3.17	2.68
1896	3.97	3.53
1897	3.16	2.65
1898	2.60	2.39
1899	2.99	2.64
1900	5.18	4.88
1901	3.70	2.90
1902	3.78	3.02
1903	4.14	3.68
1904	3.16	2.70
1905	3.64	3.41
1906	4.06	3.85
1907	4.42	4.21
1908	4.02	3.80
1909		3.54
1910	4.08	3.88
1911	3.89	3.68
1912	2.97	2.82
1913	3.53	3.33
1914	3.00	2.85
1915	2.97	2.77
1916	2.96	2.84
1917	3.02	2.84
1918	3.01	2.63
1919	2.82	2.75
1920	2.98	2.91
1921	4.01	3.91
1922	3.68	3.58
1923	3.88	3.78
1924	3.43	3.32
1925	2.91	2.81
1926		2.91
1927		3.04
1928		2.99
1929	3.34	3.23
1930	3.69	3.57
1931	4.39	4.24
1932	4.89	4.74
1933	4.84	4.69
1934	4.27	4.13
1935	3.97	3.85
1936	3.94	3.81
1937	4.05	3.93
1938	4.43	4.30
1939	4.51	4.38
1940	4.00	3.87
1941	3.59	3.48
1942	3.19	3.09
1943	3.05	2.95
1944	3.03	2.93
1945	3.10	2.94
1946	3.01	2.58
1947	2.67	2.56
1948	2.76	2.65
1949	3.34	3.23
1950	3.43	3.32
1951	3.31	3.32
1952	3.66	3.31
1953	4.01	3.66
1954	4.05	3.99
1955	4.53	4.06
1956	4.39	4.22
1957	4.28	4.34
1958	4.21	4.27
1959	4.21	4.27
1960	4.20	4.26
1961	4.36	4.27
1962	4.07	3.97
1963	4.07	3.97
1964		3.94
1965		3.85
1966		3.73
1967		3.73
1968		3.64
1969		3.49
1970		3.45

Source: Table A-6, Series C, G; Table A-7.

Table B-1. Average Number of Employees, Minnesota Iron Mines, 1882-1970.

Year	St. Louis Co.	Itasca Co.	Crow Wing Co.	Vermilion	Mesabi	Total
1885	ca. 700			ca. 700		ca. 700
1889	1755			1755		1755
1900	6929			2035	4804	6929
1906	12838			1264	11574	12838
1909	13360	2224		673	14911	15584
1914	16600	2527	1054	1280	18901	20181
1918	15307	4212	2120	1289	20358	21639
1925	10180	3847	1215			15242
1930	7752	4393	1010			13155
1935	4079	1822	305			6206
1940	5527	3047	811			9385
1945	8495	3404	839			12738
1950	10527	3661	1064			15253
1955	10381		1112			
1960	11797		642			
1965	8305		296			
1970	9631		146			

Table B-2. Average Number of Wage Earners, U.S. Iron Mines, 1850-1970.

Year	Employees
1850	2195
1860	3177
1870	15022
1880	30415
1889	36341
1902	35567
1909	47245
1920	50590
1930	30975
1935	14897
1940	25128
1943	33280
1945	26777
1948	33075
1950	31087
1953	30762
1955	23311
1957	25662
1959	28368
1961	22710
1963	18199
1965	20773
1967	18760
1969	18646
1970	17041

Source: Eighth Census of the United States: 1860. Manufactures, Vol. III, p. clxxvii; 9th Census of the US 1870: Wealth and Industry, 3, 768; 16th Census of the US: 1940. Mineral Industries 1939, US Bureau of the Census, Historical Statistics, Series E 214, p. 599-600.

Table B-3. Consumer Price Index, 1840-1970. (1967 = 100).

Year	Index	Year	Index	Year	Index
1840	30	1892	27	1944	52.7
1841	31	1893	27	1945	53.9
1842	29	1894	26	1946	58.5
1843	28	1895	25	1947	66.9
1844	28	1896	25	1948	72.1
1845	28	1897	25	1949	71.4
1846	27	1898	25	1950	72.1
1847	28	1899	25	1951	77.8
1848	26	1900	25	1952	79.5
1849	25	1901	25	1953	80.1
1850	25	1902	26	1954	80.5
1851	25	1903	27	1955	80.2
1852	25	1904	27	1956	81.4
1853	25	1905	27	1957	84.3
1854	27	1906	27	1958	86.6
1855	28	1907	28	1959	87.3
1856	27	1908	27	1960	88.7
1857	28	1909	27	1961	89.6
1858	26	1910	28	1962	90.6
1859	27	1911	28	1963	91.7
1860	27	1912	29	1964	92.9
1861	27	1913	29.7	1965	94.5
1862	30	1914	30.1	1966	97.2
1863	37	1915	30.4	1967	100.0
1864	46	1916	32.7	1968	104.2
1865	46	1917	38.4	1969	109.8
1866	44	1918	45.1	1970	116.3
1867	42	1919	51.8		
1868	40	1920	60		
1869	40	1921	53.6		
1870	38	1922	50.2		
1871	36	1923	51.1		
1872	36	1924	51.2		
1873	36	1925	52.5		
1874	34	1926	53		
1875	33	1927	52		
1876	32	1928	51.3		
1877	32	1929	51.3		
1878	29	1930	50		
1879	28	1931	45.6		
1880	29	1932	40.9		
1881	29	1933	38.8		
1882	29	1934	40.1		
1883	28	1935	41.1		
1884	27	1936	41.5		
1885	27	1937	43.0		
1886	27	1938	42.0		
1887	27	1939	41.6		
1888	27	1940	42		
1889	27	1941	44.1		
1890	27	1942	48.8		
1891	27	1943	51.8		

Source: US Bureau of the Census, Historical Statistics of the US, Colonial Times to 1970 (WashDC: GPO, 1975), Series E 135, p. 210-211.

Table B-5. Average Daily Wage, Minnesota Iron Mines, All Workers, 1897-1970.

Year	Current Dollars	1967 Dollars
1897	1.65	6.60
1900	2.07	8.28
1906	2.44	9.03
1910	2.45	8.74
1915	2.42	7.96
1920	6.01	10.02
1925	5.13	9.76
1930	5.28	10.56
1935	5.06	12.31
1940	6.40	15.24
1945	6.24	11.58
1950	10.48	14.54
1955	14.85	18.52
1960	22.43	25.29
1965	22.43	25.29
1970	28.52	24.52

SECTION II

WORKERS AND WAGES IN IRON MINING, 1850 - 1970

This section reports on the work force in the iron mines of the United States generally and of Minnesota in particular. Its focus is on the changing number of workers and on their remuneration, although some attention is paid to hours of work, working conditions, and seasonal unemployment. Some explanations of shifts in the critical parameters - the size of the work force and the rate of pay - will be attempted through reference to the growth of mining output, shifts in factor proportions (especially the substitution of capital for labor), and gains in worker productivity, but the tentative, preliminary nature of these efforts must be emphasized. Work on these issues has just begun and has yet to move much beyond description to the analysis of data and the testing of hypotheses. Still, work has progressed

far enough to permit the suggestion of some interesting possibilities and to identify promising lines of inquiry for future research.

Appendix A, Table B-2, describes the annual average number of wage earners in the United States iron mines from 1850 to 1970. After a modest increase of 50% during the 1850s, from nearly 2200 in 1850 to just under 3200 in 1860, the work force in iron mining grew rapidly, although at a steadily decelerating pace, reaching 15,000 in 1870, 30,000 in 1880, and more than 36,000 by 1889. The number of workers then remained fairly stable to 1902, jumped sharply to 1909, when it reached 47,000, and then tailed off slowly, to 43,000 in 1915. Wartime demands for ore led to a sharp increase in the workforce, quickly driving it to an all time peak of over 60,000 in 1917. The number of employees fell off sharply with the postwar slump, reaching a low of 32,000 in 1921, but did not rebound fully with the recovery of production as sharp gains in ore production per worker permitted mine operators to nearly match previous levels of output with roughly half the workforce. The Great Depression cut the work force substantially, to 12,600 in 1932 and then witnessed a slow but fairly steady recovery to 33,000 in 1943. The number of wage earners in U.S. iron mines fluctuated around 30,000 for the remainder of the 1940s and through the early 1950s hovered around 27,000 (despite sharp declines in 1955 and 1958) until 1960. The 1960s witnessed a steady decline in the number of workers until, by 1970, just over 17,000 wage earners were employed in iron mining in the United States.

Appendix B, Table B-1 reports the average number of wage earners in Minnesota iron mines subdivided by county and when possible by range. Making due allowance for its late start, the series parallel that for the United States as a whole with some few exceptions. In

Minnesota, employment peaked in 1911 rather than 1917, showed more of a tendency to grow in the late 1940s and early 1950s when the work force in the U.S. as a whole was fairly stable, and, at least in St. Louis County, did not experience the decline that occurred nationally during the 1960s. Data by range, available only to 1918, is of particular interest, for it shows that the work force on the Vermilion peaked at the turn of the century while employment on the Mesabi grew for another twenty years, a difference which may prove useful in sorting out demographic differences between the two regions.

The changing size of the work force in the iron mines of the United States and of Minnesota can be understood as a product of the interaction between three processes: the expansion of the industry, changes in the factor proportions (the displacement of labor by capital), and gains in the productivity of labor. Thus, when the industry expanded rapidly with few changes in technique the work force grew apace, but rapid growth of output achieved by technical progress and the substitution of capital for labor could mean only slow growth, at times even a fall, in the number of workers. We can, with the aid of periodization of the growth of iron mining presented in Section I of this report, gain some understanding of the changing size of the work force through a focus on the expansion of the industry, shifts in factor proportions, and improvements in productivity.

In the forty years from 1850 to 1890, iron ore production grew at rapid rates in the United States, but the period was marked by little technical progress as growth was achieved primarily through the successful exploitation of new, high quality ore deposits. As a result, the work force expanded as rapidly as did ore production. Indeed, until 1880 the work force grew at higher rates than did output, apparently because the rapid expansion of existing mines quickly pushed them

to capacity and led to more labor intensive methods of extraction, a process not entirely offset by the development of new sites. As early as the 1870s, however, there were signs that this situation would not persist. During the 1860s, output per worker declined sharply, but during the 1870s a doubling of the amount of capital employed per wage earner compensated for the decline in the quality of deposits and kept the work force from growing more rapidly than production. In the 1880s, continued increases in the capital per worker combined with changes in technique - probably associated with the beginnings of non-selective mining in underground operations - to produce a sharp increase in labor productivity and keep the rate of growth of the work force below that of the iron ore output. Between 1880 and 1889, ore production doubled while the number of workers grew by only 20%. Thus, we can view the years from 1850 to 1890 as a period during which the increased capitalization of iron mining gradually improved the productivity of labor and narrowed the gap between the growth rate of the work force and that of output, until, by the 1880s, iron ore production grew more rapidly than did the work force.

This trend continued into the early twentieth century, but with much greater intensity. Further substitutions of capital for labor, the spread of non-selective techniques in underground mines, and especially the development of open pit mining on the Mesabi Range led to a major gain in worker productivity, from just under 400 tons per wage earner per year in 1889 to over 900 tons by 1902. As a result, mine operators were able to increase production by nearly 250% with virtually no growth in the number of employees. Despite modest reductions in the amount of capital per worker over the first two decades of the twentieth century, the further spread of non-selective techniques and the continued growth of open pit mining permitted the

trend to persist, although the gains in productivity of labor from 1902 to 1919 were modest in comparison to those achieved in the last decade of the nineteenth century. However, the expansion of output was sufficiently rapid to overcome the trend and drive the work force to its peak in 1917.

During the 1920s a decline in the accessability and quality of iron ore combined with stagnant demand to create strong incentives for technical innovations in mining. Owners sharply increased the capital intensity of the industry and nearly doubled the productivity of the work force. In consequence, the number of wage earners fell steadily for the first time, declining by more than half from 1917 to 1929, despite relatively constant levels of output. The work force declined by half again with the onset of the Great Depression, but began to grow by the middle 1930s, reaching the level of the 1920s at about the time the U.S. entered World War II. Renewed gains in output per worker, however, largely the consequence of the growing share of open pit mines in total output, put a ceiling on the work force and kept it from expanding as rapidly as ore production. Worker productivity was fairly stable during the 1950s and the size of the work force fluctuated wildly with output, but the taconite revolution brought a sharp increase in ore production per worker and a substantial decline in the labor force during the 1960s, despite a relative stability in iron ore shipments.

Unfortunately, it has not proved possible to describe with precision the changes in the occupational structure of the work force that accompanied fluctuations in the number of wage earners. The available evidence is simply too inconsistent in its classification schemes to permit accurate measurement. Indeed, it is not even possible to identify secular trends with certainty since there were

clearly contradictory forces at work. On the one hand, the development of non-selective mining methods rendered the traditional skills of the miner obsolete and tended to reduce the average skill level of the work force. On the other hand, the growing capital intensity of the industry increased the need for skilled workers to operate and maintain the increasingly complex equipment. Both developments are evident in Table 1, which contrasts the occupational structure of open pit and underground mines in Minnesota in 1900. Clearly, underground mines employed higher proportions of trammers and skilled miners and smaller percentages of skilled workers and common laborers than did open pit operations. Since the major change in technique in this period was the growth of open pit mines, we can read the table as a time series describing the transformation of the occupational structure in iron mining that occurred in the late nineteenth and early twentieth centuries. Building upon these data and what has already been reported about mining techniques, it is possible to hazard some generalizations concerning the changing composition of the work force in U.S. iron mines. From 1850 to 1890 the general stability of technology suggests a constant occupational structure, although the slow but steady growth in capital and horsepower per wage earner perhaps increased the employment of skilled workers. During the 1890s, however, it is likely that the job mix shifted rapidly as the growth of open pit mines and the spread of non-selective methods in underground operations sharply reduced demand for skilled miners, slowly increased the need for skilled workers to man and maintain machinery, and raised sharply the demand for common labor, a change reflected in the ethnic mix of the mine work force by the growing proportion of non-English speaking immigrants among mining populations, especially Finns, Croats, Italians, Slovenes, and Serbs. These trends probably continued, although at a much slower

Table 1. Occupational Structure, Underground and Open Pits, Minnesota, 1900.

	Miners	Trammers	Skilled Workers	Laborers, Common	Total
Underground Mines	1841 34.2%	796 14.8%	152 2.8%	2449 45.5%	5381 100%
Open Pit Mines	178 11.4%	66 4.2%	135 8.6%	1183 75.7%	1562 100%

Source: Minnesota Bureau of Labor, Seventh Biennial Report, 1899-1900, p. 277, 285-286.

pace, to about 1920, when it is likely that the proportion of unskilled workers in U.S. iron mines reached a peak. Thereafter, and until the present, reductions in the work force were achieved by replacing unskilled labor with machines, a substitution that increased the need for skilled workers. This trend probably proceeded most rapidly in periods that witnessed sharp gains in the productivity of labor, especially in the 1920s and the 1960s.

Table 2 summarized data on real daily wages in iron mining presented in more detail in Appendix A, Tables B-3 to B-6. Figure 1 is a graphic representation of these data. Perhaps the most striking pattern to emerge from this evidence is that the wages of workers in iron mining have grown fairly steadily, if slowly, over the 130 years from 1840 to 1970, at an annual rate of between 1 and 1½ percent. Not that the advance was without interruption: miners' wages were fairly stable in the 1870s and again from about 1905 to 1925 (twenty years during which technical changes in the industry sharply reduced demand for miners), while the wages of highly skilled and relatively well-paid steam shovel operators failed to grow from 1905 to 1935. Nevertheless, wages did show a strong and fairly steady upward drift, a trend most evident in the average compensation for all Minnesota iron workers, a series that captures the effects of both changes in the pay rates within particular occupations and shifts in the composition of the work force.

Daily wage rates are, of course, a crude index to the remuneration of iron workers. In order to understand changes over time in the living standards of miners and their rates of pay we need to examine several other parameters: hours of work; the regularity and security of employment; the movement of wages over the life course; opportunities for job mobility; working conditions; and the ability of families to capture

FIGURE # 1. Tables B-3 thru B-6 represented graphically.

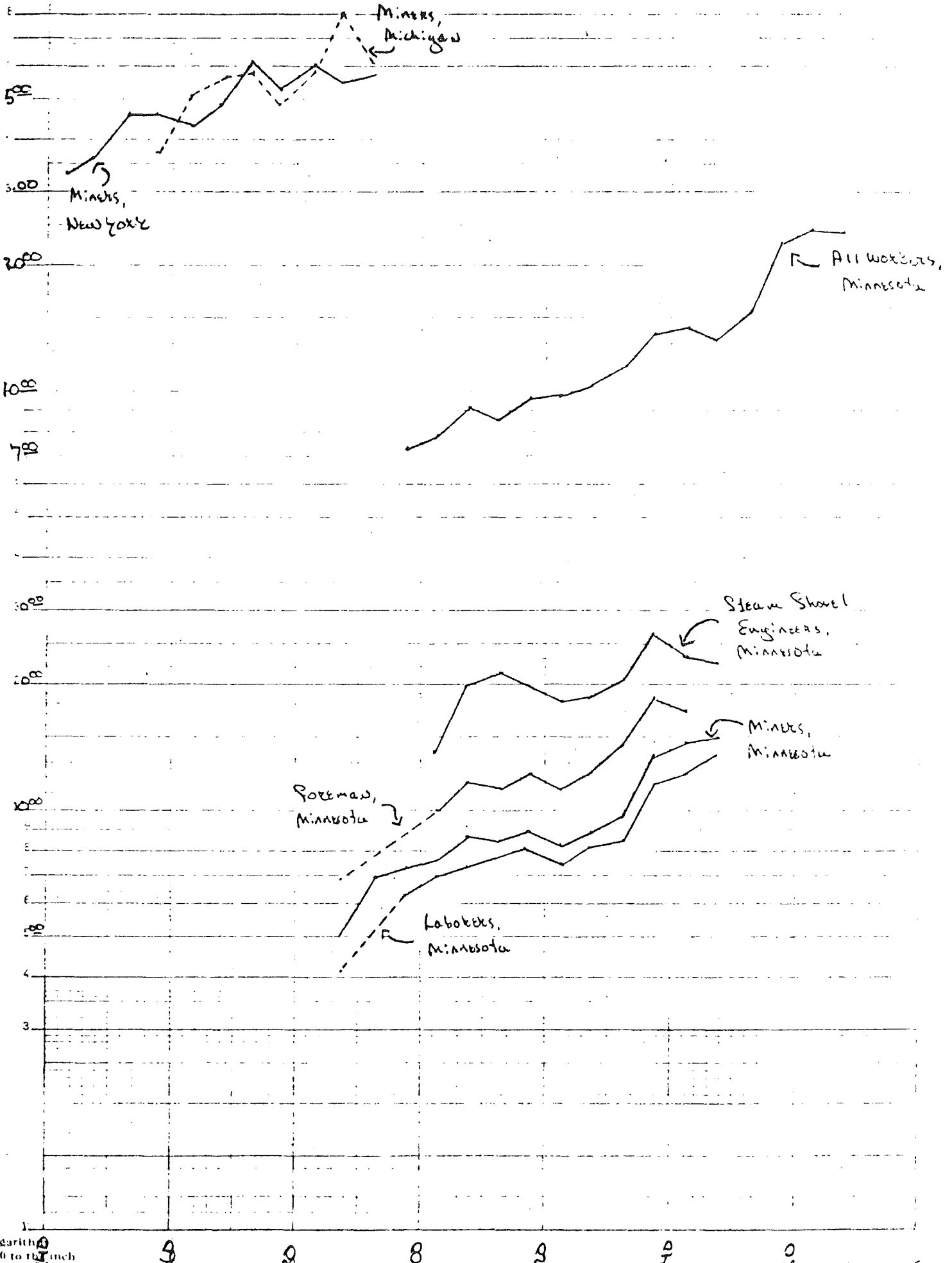


Table 2. Average Daily Wages, Iron Mine Workers, 1840-1970, In 1967 Dollars.

Year	New York Miners	Minnesota Miners	All Minnesota Workers
1841-45	3.32		
1846-50	3.64		
1851-55	4.62		
1856-60	4.63		
1861-65	4.30		
1866-70	4.85		
1871-75	6.14		
1876-80	5.24		
1881-85	6.07		
1886-90	5.52	5.11	
1891-95	5.72	6.99	
1896-1900		7.36	
1901-05		7.61	
1906-10		8.74	
1911-15		8.44	
1916-20		8.95	
1921-25		8.34	
1926-30		8.99	
1931-35		9.79	
1936-40		13.65	
1941-45		14.59	
1946-50		13.54	
1951-55			15.44
1956-60			26.94
1961-65			24.43
1966-70			24.19

income from alternative sources. Precise data is not available on any of these issues, but enough is at hand to permit generalizations about the direction of change that will help in our quest to understand the changing living standards of miners and their families.

Increasing daily wage rates were accompanied by gradual reductions in the length of the working day and steady improvements in working conditions. Twelve hour days and six day weeks prevailed in the U.S. iron mining industry to the middle 1850s, when 10 hours and six days became the norm. Such work weeks remained standard until the first decade of the twentieth century, although, by 1909, a substantial number of mines were operating on eight and nine hour shifts. In Minnesota, however, all but three mines worked 10 hours in 1909. Minnesota mine operators adopted the eight-hour day for underground workers in 1912, but the reduction proved temporary. By 1919 ten hours was again the standard in the state, despite the fact that eight hour shifts prevailed in other U.S. iron mining regions. By the mid-1930s, eight hours per day, six days per week was the norm in Minnesota, and, in 1937, the current 40-hour week was adopted. Working conditions are difficult to describe succinctly and with precision, but some evidence of the direction and magnitude of change is available in the statistics on injuries presented in Table B-7 at the end of this section. Minnesota's iron mines were a dangerous place to work in the early twentieth century. Fatal accidents occurred at an annual rate of 5 to 7 per 1000 workers, serious injuries which disabled workers for at least a month ran from 12 to 16 per 1000, while one of every 13 to 16 workers could expect to be injured severely enough during the course of the year to lose some work time. Beginning about 1908, conditions began to improve. Fatalities fell to 2 to 3 per thousand by the 1910s, 1 to 2 per thousand by the 1920s, below 1 per thousand by the

1930s, and they continued to fall, averaging only .16 per thousand in the 1970s. Injuries show the same gradual decline: at the beginning of the century, one in fourteen workers could expect serious injury during a year; by the 1970s only one in 160 would be severely injured. Death and maiming, once a common occurrence in Minnesota's iron mines, had become rare accidents which most workers could expect to avoid while on the job.

Mine workers suffered periodic layoffs, both seasonal and cyclical. As Table 3 shows, employment levels were fairly stable in underground mines, but in open pit operations weather sharply restricted activity from January through April when the work force fell to half or less of its peak. Given the steady growth of the share of ore mined through open pit methods, seasonal unemployment must have cometo be an increasing burden on the iron range work force until union contracts guaranteed steadier work. Table 4, which presents the average annual earnings of workers in iron mining from 1850 to 1939 and in metal mining from 1902 to 1970, while interesting in its own right, suggests something of the changing impact of seasonal unemployment on income. Prior to the middle 1930s, annual income rose more slowly than daily wages, indicating that workers found it increasingly difficult to work a full year. Indeed, from 1919 to 1935 in iron mining and during the early 1930s in metal mining generally, annual income actually fell despite increasing daily wages, suggesting especially severe seasonal unemployment. Since about 1935, however, annual income grew more rapidly than daily wages, indicating steadier work and a reduction in seasonal layoffs.

Several issues relating to income remain to be discussed: the movement of wages over the life cycle, job mobility, and alternative sources of income available to the families of mine workers. These will be examined in the next section.

Table 3. Wage Earners Employed by Month in Lake Superior Iron Mines As a Percent of Maximum, 1909.

Month	Open Pit Mines	Underground Mines
January	43.8	88.0
February	43.7	90.3
March	43.7	91.2
April	54.7	88.4
May	91.0	89.4
June	98.7	89.3
July	97.7	92.0
August	100.0	93.6
September	97.2	97.1
October	98.8	99.0
November	96.5	99.3
December	89.5	100.0

Source: Thirteenth Census of the United States, 1910, Mines and Quarries, 1909, p. 247.

Table 4. Average Annual Earnings of Wage Workers, 1850-1970.

	Iron Mining		Metal Mining	
Year	Current Dollars	1967 Dollars	Current Dollars	1967 Dollars
1850	269.56	1078.24		
1860	285.77	1058.41		
1870	454.53	1196.13		
1880	308.94	1065.31		
1889	409.95	1518.33		
1902	554.21	2131.58	794.00	3054
1909	629.30	2330.74	865.00	3204
1919	1655.26	3195.48	1611.00	3110
1929	1434.46	2796.22	1613.00	3144
1935	983.23	2392.29	1239.00	3015
1939	1350.78	3247.07	1515.00	3642
1945			2551.00	4733
1950			3608.00	5004
1955			5076.00	6329
1960			6147.00	6930
1965			7212.00	7632
1970			9137.00	7856

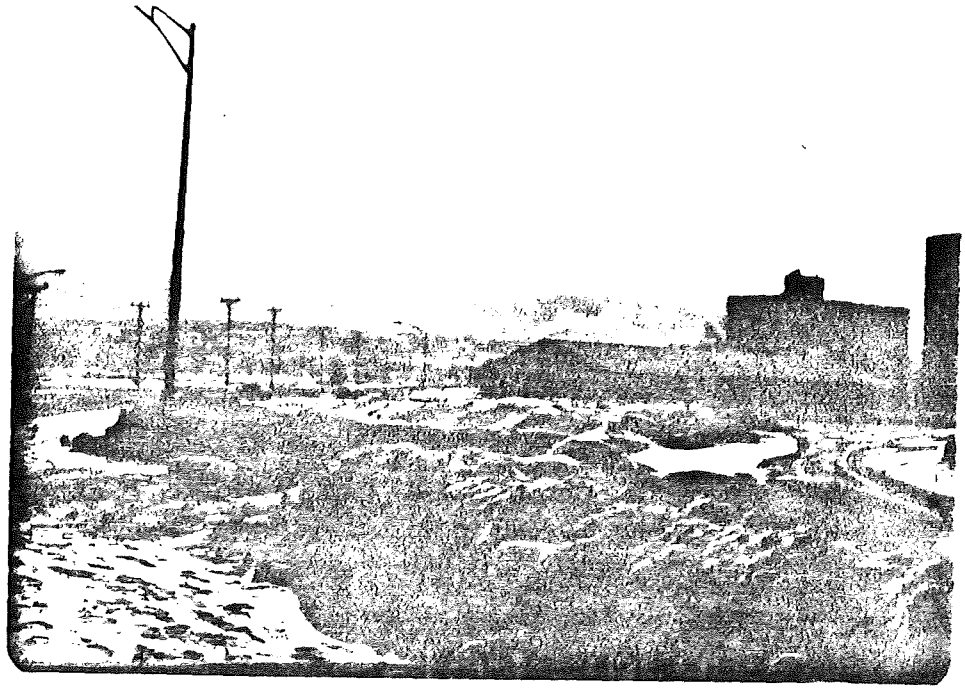
Table B-7. Fatalities and Injuries Per 1000 Wage Earners, St. Louis County Iron Mines, 1898-1976.

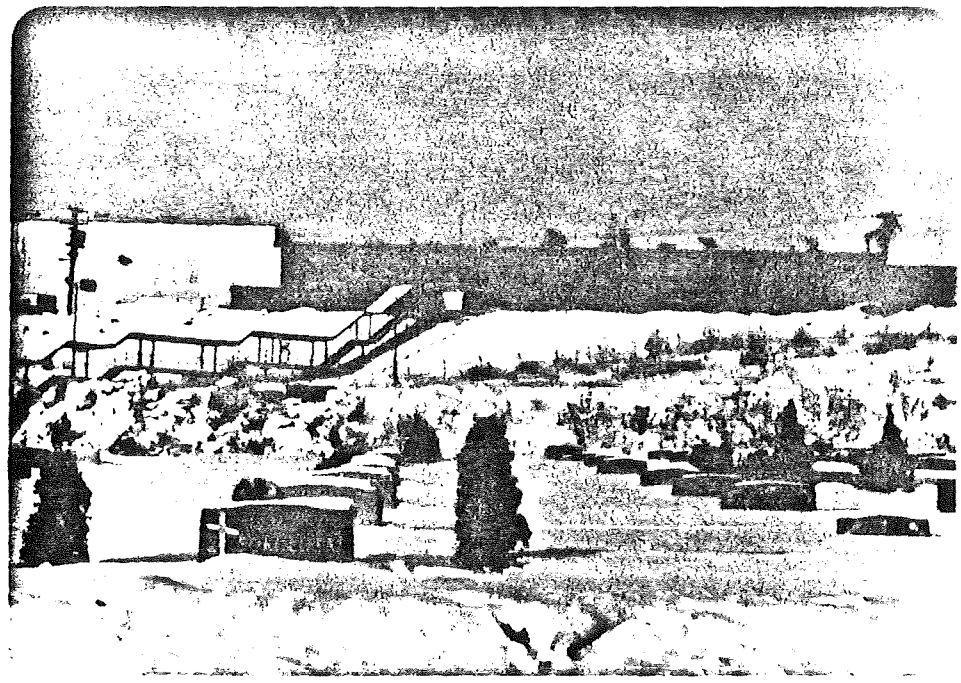
Year	Fatalities Rate Per Thousand	Total Injuries Rate Per Thousand
1898	5.02	63.01
1899	5.24	64.91
1900	5.63	63.93
1901	4.98	77.60
1903	5.95	
1906	7.48	
1907	5.21	
1908	4.05	
1909	4.56	
1910	4.03	
1911	3.90	
1912	3.31	
1913	2.74	
1914	2.59	
1915	2.09	
1916	2.32	
1917	1.51	
1918	3.92	
1919	2.39	
1920	2.55	
1921	2.15	23.91
1922	2.41	13.32
1923	2.27	
1924	1.82	
1925	1.77	
1926	1.62	21.60
1927	2.43	23.38
1928	1.12	36.42
1929	2.12	22.74
1930	1.68	
1931	0.83	
1942	1.70	13.21
1943	0.73	16.26
1944	0.64	26.30
1945	1.41	20.60
1946	0.84	23.52
1947	1.03	17.56
1948	0.49	17.30
1949	0.72	19.32
1950	0.38	15.50
1951	0.66	15.82
1952	0.18	14.76
1953	0.33	17.80
1954	0.40	15.82
1955	0.19	14.55
1956	0.54	12.16
1957	0.47	11.25
1958	0.00	8.10
1959	0.43	10.05
1960	0.16	11.19

Table B-7. Fatalities and Injuries Per 1000 Wage Earners, St. Louis County Iron Mines, 1898-1976.

Year	Fatalities Rate Per Thousand	Total Injuries Rate Per Thousand
1961	0.43	5.54
1962	0.11	6.57
1963	0.26	3.91
1964	0.12	3.21
1965	0.00	6.38
1966	0.43	5.93
1967	0.44	5.89
1968	0.22	6.01
1969	0.00	6.17
1970	0.32	7.37
1971	0.00	6.14
1972	0.00	6.68
1973	0.40	5.72
1974	0.09	6.47
1975	0.00	6.54
1976	0.09	6.69

Source: Minnesota Bureau of Labor, Reports, 1898-1976.





SECTION III

THE POPULATION PROCESS ON THE MINNESOTA IRON RANGE, 1880-1970

This section has three objectives. First, it describes the demographic characteristics of the Iron Range - the size of the population and its composition by age, sex, and nativity - and offers an explanation of changes in those characteristics rooted in the analysis of the growth of the mining industry. Second, it relates the process of population change on the Iron Range to the demography of the American frontier from the seventeenth through the twentieth centuries. Third, it explores the fertility decisions of mining families, an especially fruitful line of inquiry that permits an examination of the interaction between individual choice and market forces at an intensely personal level and yields real insight into the strategies the people pursued in their effort

to achieve security in an often difficult, sometimes hostile, environment.

First, some comments about arguments and evidence. The arguments in this chapter rest on examination of individuals and families spread throughout the Range from the state censuses of 1885 and 1895 and on a detailed study of eight communities - Virginia, Hibbing, Ely, Eveleth, Chisholm, Crosby, Gilbert, and Nashwauk - from published census returns. In addition, I have occasionally drawn on material from the Michigan Iron Ranges and from various government reports to test, extend, and bolster arguments. The evidence at times seems intractable, especially that from the published materials, and it has often proved impossible to construct precise and consistent measures of crucial variables, making it necessary to rely on less than satisfactory proxies. The argument, finally, is still at a preliminary stage. It demands extensive statistical testing, but as yet rests on visual inspection of a mass of data. And it proceeds at a high level of abstraction, even though dense, empirical detail is often called for. Nevertheless, I am confident of the accuracy and power of the major generalizations and trust that when direct measures are substituted for crude proxies, when statistical tests replace casual empiricism, and when the evidence in all its detail is brought to bear on the central issues, the principal arguements, with some revision about their edges, will remain in place.

We can begin with the changing size of the population. Table 1 presents the total population of the Iron Range for the years 1880 to 1970, along with figures for Northeastern Minnesota and the state to provide a context for comparison. The data appear graphically in Figure 1. The growth of the population on the Iron Range describes a distinct and fascinating pattern. The number of inhabitants on the

range grew very rapidly, although at a steadily decelerating pace, from first settlement in the early 1880s to a peak of just under 100,000 in 1920, shortly after the work force in Minnesota's iron mines reached its maximum. The population fell to about 90,000 in 1930 and then - with the exception of the 1950s, when, fueled by the baby boom, it again approached 100,000 - fluctuated gently around that level to 1970. In the state as a whole, on the other hand, population grew fairly steadily, at about 1% annually, from 1910 on, while Northeastern Minnesota, despite some sluggishness (in part because inhabitants of the Iron Range made up a third of the total), also showed continued growth in the years after 1920, except during the 1940s. Unfortunately, it is not possible to follow this process of rapid growth followed by stagnation with aggregate data for the Iron Range as a whole, but we can gain some understanding of the population dynamics by following the progress of an idealized community constructed out of the data on individuals from the 1885 and 1895 census returns and from the evidence on the shifting demographic structure of the eight Range towns selected for intensive study.

When a new mining community was developed, or opened initially, it grew very rapidly, although at a steadily decelerating pace (i.e., the growth function was at first logarithmic), for roughly twenty to thirty years before grinding to a halt. Thereafter, total population tended to fluctuate gently - up in some years, down in others - around a slowly falling trend (see Table 2).

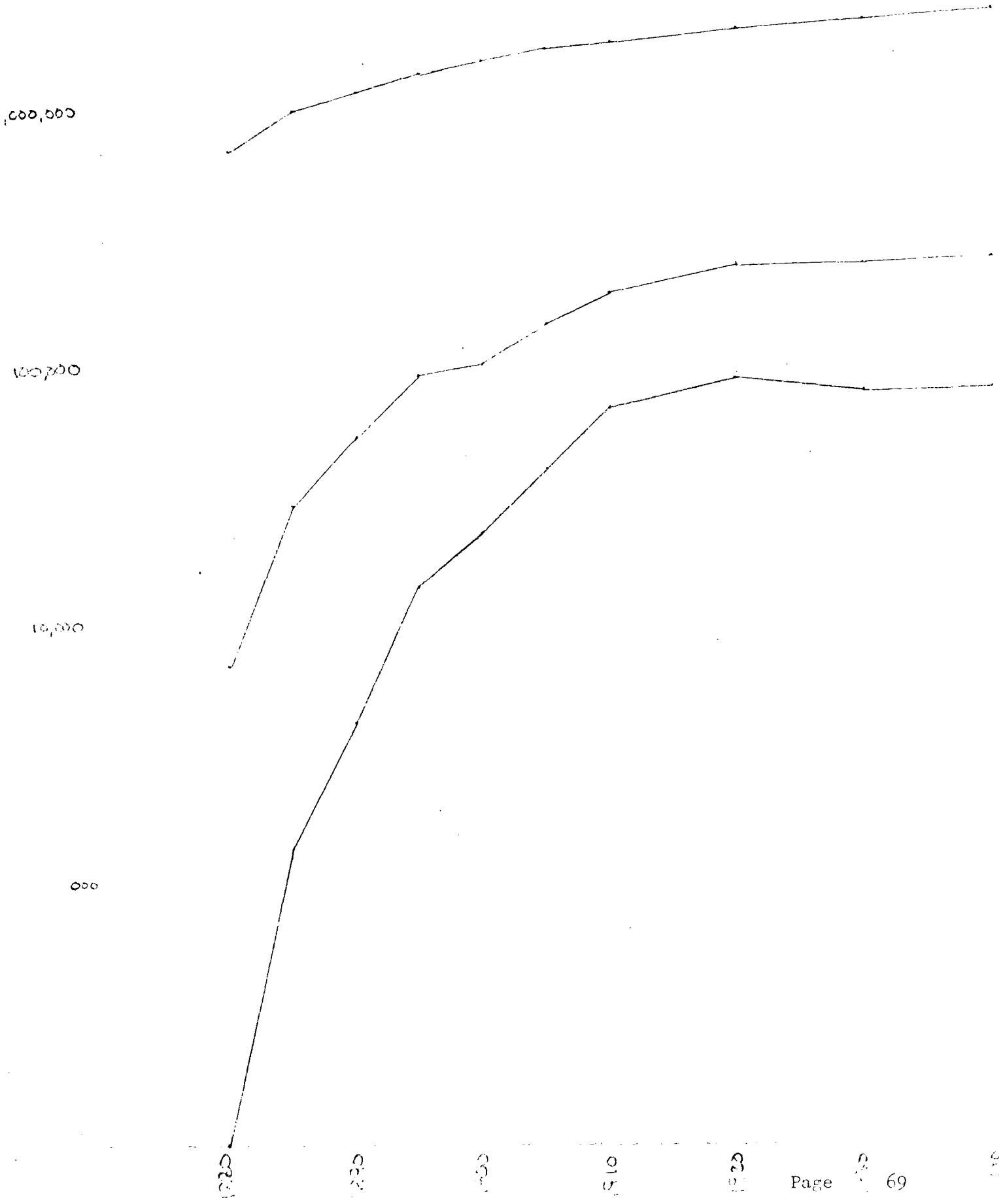
For the first fifteen years or so, growth was almost entirely due to migration and, since migrants were largely male, largely young adults, and predominantly foreign born, this set the composition of the population. Indeed, when new mines were being developed far from existing settlements, the population often consisted only of

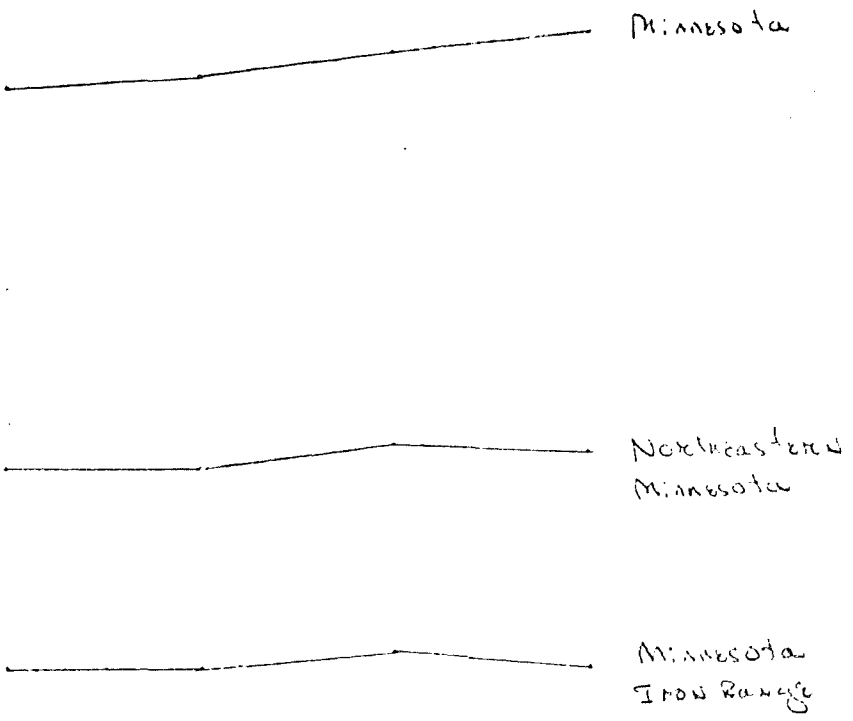
Table 1. Total Population of Minnesota, Northeast Minnesota, and Minnesota Iron Range, 1880 - 1970.

Date	Minnesota	Northeast Minnesota*	Minnesota Iron Range
1880	780,733	7,484	100
1885	1,117,798	31,596	1,426
1890	1,301,826	58,316	4,497
1895	1,574,619	101,963	15,154
1900	1,751,394	113,962	24,737
1905	1,979,912	163,045	43,418
1910	2,075,708	217,061	76,569
1920	2,387,125	279,948	97,002
1930	2,563,953	281,959	89,822
1940	2,792,300	297,990	90,958
1950	2,982,483	295,266	90,207
1960	3,413,864	330,969	98,456
1970	3,804,971	319,226	90,682

*Aitkin, Cook, Crow Wing, Itasca, Lake, and St. Louis Counties.

Figure 1. Population of Minnesota, Northeastern Minnesota, and the Minnesota Iron Range, 1880-1910.





Continuation of Figure #1, Section III.

Table 2. Total Population, Selected Iron Range Communities, 1890-1970.

Year	Virginia	Hibbing	Ely	Eveleth	Chisholm	Crosby	Gilbert	Nashwauk
1890			901					
1895	3647	1085	2260	764				
1900	2965	2481	3717	2752				
1905	6056	6566	4045	5332	4231			684
1910	10473	8832	3572	7036	7684		1700	2080
1920	14022	15089	4902	7205	9039	3500	3510	--
1930	11963	15666	6156	7484	8308	3451	2722	2555
1940	12254	16385	5970	6887	7487	2954	2504	2228
1950	12486	16276	5474	5872	6861	2777	2247	2029
1960	14034	17731	5438	5721	7144	2629	2591	1712
1970	12450	16104	4904	4721	5913	2241	2287	1341

workers, all men, nearly all between 20 and 35 years old, and the vast majority foreign born. Quickly, however, by the time local mines began to ship ore, the site began to acquire some of the characteristics of a permanent community. The sex ratio (males per hundred females) in these new towns was initially very high, at least 250 overall and more than 450 among adults (tables 3 and 4). The percentage of the population over 21 years of age was also high, perhaps 80% (table 5), but there were few older people in the population. The new towns were thoroughly dominated by young adults. The proportion native born in the population was low, perhaps 20 to 30% of the inhabitants (table 6). Crude birth rates were low, a function of the small proportion of women in the population (but this was in part compensated for by the small proportion of very young and very old people). Death rates were also low, a function of the age structure: the bulk of the population was in its twenties and thirties, when the chances of dying are relatively lower than at other ages.

The net migration rate declined sharply over about twenty years, until the community began to suffer a net loss to migration. At the same time, the rate of natural increase and its importance to the overall growth rate rose, reaching a peak at (probably just after) about the time when net migration rates became negative. This helped change the composition of the population, a process furthered by changes in the composition of the migrant stream as miners who had struck out for a new job on their own later brought their families to join them. The sex ratio declined sharply, although it took about fifty (50) years for it to approach unity, the percent native-born rose (slowly at first while the net gain to migration

remained relatively high, then rapidly, and then slowly again). The proportion of the population age 21 and over fell, reaching its low point about thirty years after the opening of the community. Crude birth rates and crude death rates rose, the first because of the increased proportion of women, the second because of an increase in the proportion of people in age categories with relatively high death rates (infants and old people).

Fertility rates were initially low and rose sharply to a peak during the first decade. This occurs elsewhere - in British America during the seventeenth century, in nineteenth-century Midwest farm communities, and in new cities - and may have to do, as has been suggested elsewhere, with fairly subtle shifts in the age composition of women aged fifteen to fourty-four and with changes in the age at marriage for women. Fertility peaked roughly ten to fifteen years after the establishment of the community, stayed high for a time, and then, just after the net loss to migration set in, began to decline, reaching a low point about fifty years after the community was first settled (see Table 7). As a consequence, both the crude birth rate and the rate of natural increase fell (although the still increasing proportion of women acted as a brake on this process at first). The net result, reached roughly thirty years after first settlement, was a population in equilibrium, with small gains to natural increase roughly offset by small losses to migration. All of this is summarized in Figure 2. I am more confident about directions and the relative timing of the various processes (which are the critical elements in the model) than about the levels at which the several indexes are set in the figure or the absolute timing in relation to settlement date. The model clearly requires adjustment to account for changes in time in the process. Tables 3 through 7

Table 3. Sex Ratios, Selected Iron Range Communities, 1895-1970.

Year	Virginia	Hibbing	Ely	Eveleth	Chisholm	Crosby	Gilbert	Nashwauk
1895	271.0	474.1	164.0	600.9				
1900	228.0		177.2	202.4				
1905	199.1	201.9	149.2	177.6	240.9			
1910	169.2	187.6	131.8	285.4	189.1			
1920	118.5	149.9	118.4	117.4	116.7	114.1	117.1	
1930	103.4	105.0	117.1	107.7	107.1	112.8	106.4	127.1
1940	101.2	102.9	114.4	107.8	109.0	110.4	114.9	118.2
1950	98.8	99.9	110.0	103.2	104.6	105.4	108.2	107.2
1960	95.1	94.3	105.1	96.1	97.9	88.6	100.1	99.8
1970	89.7	89.8	97.5	92.5	89.6			

Table 4. Adult Sex Ratios, Selected Iron Range Communities, 1895-1970.

Year	Virginia	Hibbing	Ely	Eveleth	Chisholm	Crosby	Gilbert	Nashwauk
1895	(456.9)		(237.7)	(757.8)				
1900								
1905								
1910	(249.3)	(284.9)	(174.4)	(236.2)	(221.2)			
1920	140.9	198.0	142.1	142.1	146.7	130.7	136.7	
1930	108.7	110.4	131.2	116.0	112.4	121.7	105.5	152.7
1940	102.8	103.1	122.4	109.6	112.4	110.9	121.6	123.7
1950	97.2	99.2	111.8	102.0	104.3	103.8	106.7	113.8
1960	92.5	92.9	105.1	92.9	94.9		98.1	
1970	83.0	85.4	93.9	87.3	85.7			

Note: Figures in parentheses are estimates.

Table 5. Percent of Population Aged 21+, Selected Iron Range Communities, 1895-1970.

Year	Virginia	Hibbing	Ely	Eveleth	Chisholm	Crosby	Gilbert	Nashwauk
1895	(71.9)		(59.5)	(93.2)				
1900								
1905								
1910	(60.1)	(63.4)	(50.6)	(57.2)	(60.2)			
1920	55.4	60.7	47.2	51.9	48.5	53.3	46.5	
1930	58.0	55.6	52.9	53.9	61.2	52.0	50.9	55.2
1940	68.9	63.8	65.3	67.1	67.8	59.8	67.6	62.2
1950	69.3	65.7	67.0	69.7	68.4	63.4	68.2	66.3
1960	62.7	60.3	65.3	66.1	61.7		60.1	
1970	64.7	61.4	66.0	64.7	63.6			

Note: Figures in parentheses are estimates.

Table 6. Percent of Population Foreign Born, Selected Iron Range Communities, 1895-1970.

Year	Virginia	Hibbing	Ely	Eveleth	Chisholm	Crosby	Gilbert	Nashwauk
1895	65.9	67.4	61.6	71.4				
1900	47.0		59.7	65.6				
1905	50.5	53.9	54.9	55.8	63.9			54.5
1910	51.0	49.2	48.0	53.4	58.2			
1920	34.4	36.6	37.3	36.9	37.7	28.3	37.2	
1930	25.7	22.9	29.2	30.4	30.2	21.6	30.8	25.7
1940	21.7	17.8	24.1	26.8	28.0	18.2	29.4	28.8
1950	17.9	14.3	19.7	23.2	23.1	13.8	26.2	18.7
1960	10.5	10.0						
1970	6.9	6.3	7.8	9.6	8.2			

Table 7. Ratio of Children, Age 0-9 to Women Age 21+, Selected Iron Range Communities, 1910-1970.

Year	Virginia	Hibbing	Ely	Eveleth	Chisholm	Crosby	Gilbert	Nashwauk
1910	1254.2	1143.0	1663.1	1562.2	1682.9			
1920	1098.7	1112.8	1623.9	1234.3	1602.6	1254.1	1591.4	
1930	620.4	780.6	862.2	700.0	900.2	946.9	593.5	
1940	370.2	452.1	474.9	405.9	362.2	580.0	411.0	
1950	512.9	611.7	594.1	477.3	580.3			
1960	641.6	702.1	546.1	550.7	651.0		781.2	
1970	379.3	478.1	463.2	386.3	393.1			

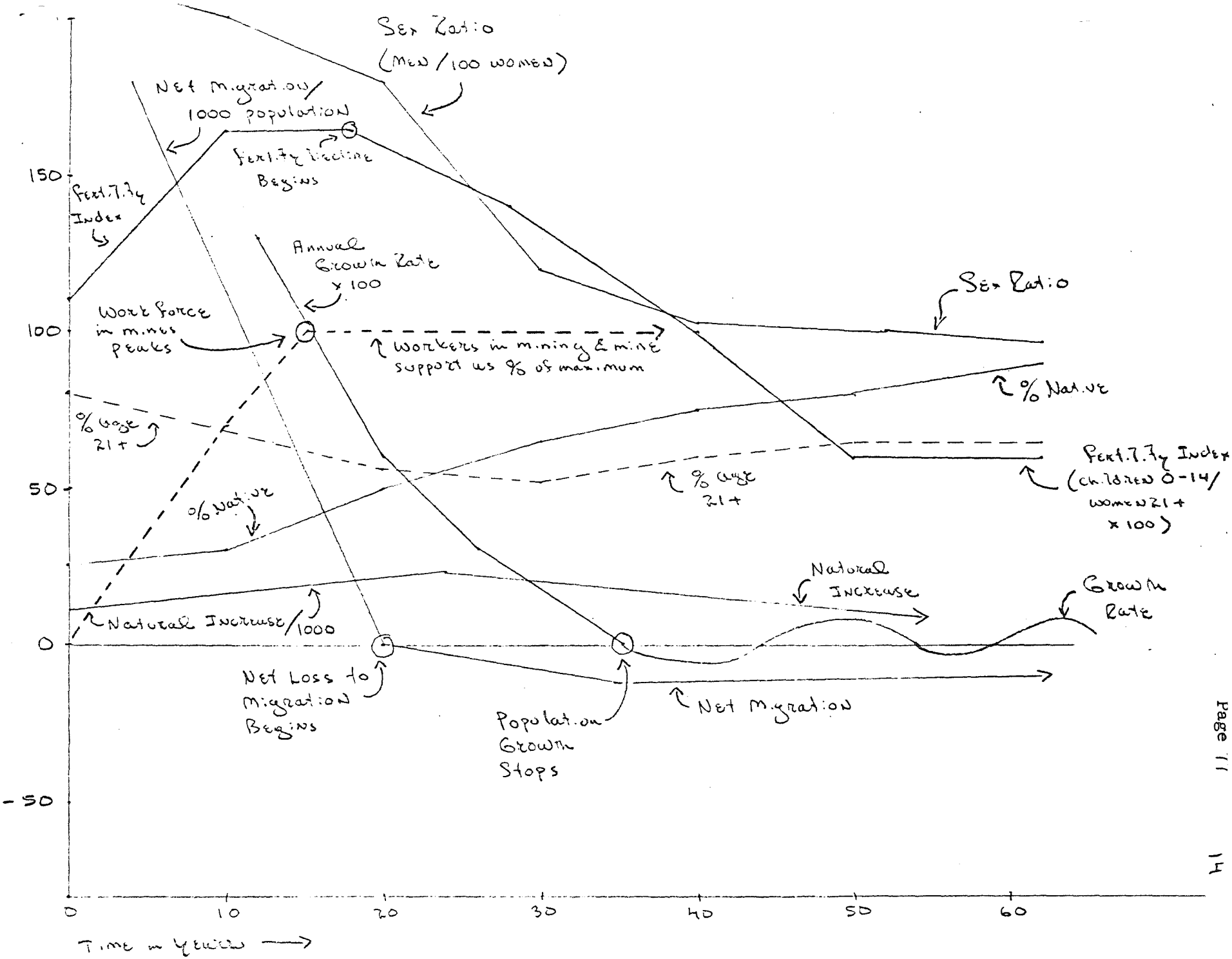
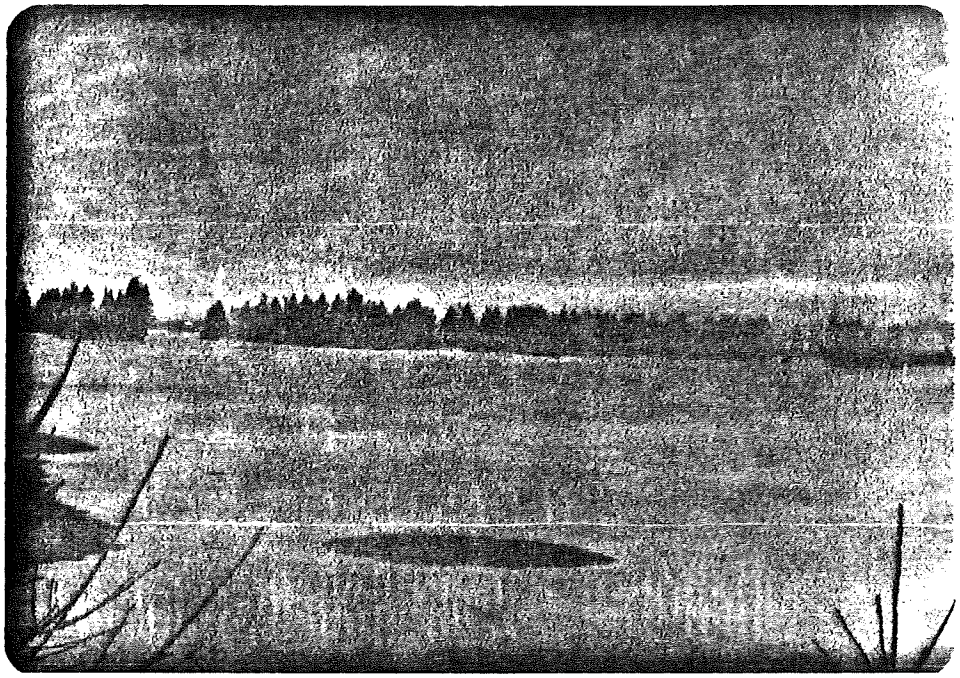
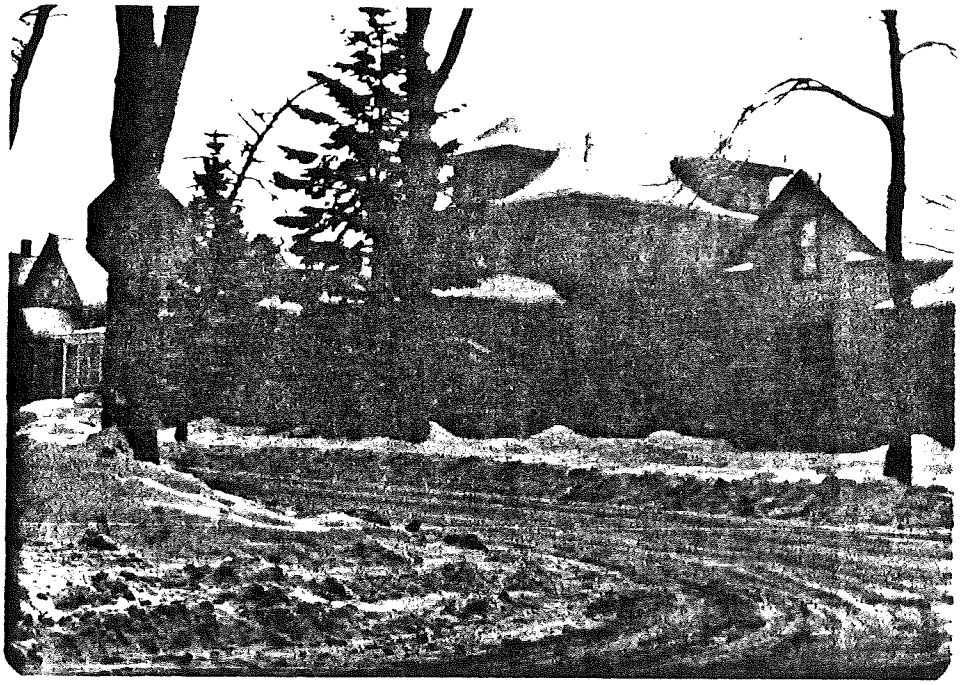


Figure 2. Preliminary Model of the Population Process in a Lake Superior Iron Range Community, 1850-1940





suggest that towns settled relatively late in the history of the Iron Range show much less imbalance and less extreme fluctuation than those towns established in the nineteenth century. And the model requires more precise specification. Still, it is a good beginning and it does help to organize a mass of data.

What is missing in the analysis so far is a variable relating this to the process of economic growth. Probably, the number of workers in mining and mining-support activities is the key which regulates the process, setting the timing of changes in the other variables by changing the opportunities available in the community which in turn attracted or repelled migrants and shaped family strategies, including decisions about family size. Unfortunately, we have not yet been able to construct such an index at the local level. However, data for the Range as a whole and a crude proxy presented in the final section of this chapter are sufficient to justify a hypothetical description of its path. The number of workers in mining and support activities seems to peak shortly before the net loss to migration begins, with the remaining growth accounted for by the gradual building up of local service activities - government, education, retailing, and the like. That is, the initial job opportunities in mining take the population most of the way toward its ultimate total, with the remainder accounted for by the growth of the "domestic sector" of the economy and by the changing composition of the population as miners find spouses and have children.

One fascinating aspect of the population process in the Minnesota Iron Ranges is its similarity to growth patterns in other newly settled regions in British America and the United States. Those familiar with the work of Richard Dunn on the West Indies,

Peter Wood on the Lower South, Menard on the Chesapeake colonies, James Lemon on southeastern Pennsylvania, Philip Greven and Kenneth Lockridge on New England, and Richard Easterlin on the Midwest in the nineteenth century, will recognize the pattern just described. Region after region goes through a transition from initially high growth to zero growth or negative growth. And this transition seems everywhere to be accompanied by similar changes in both the composition of the population and the components of growth. In composition, we continually find a decline in the sex ratio, an increase in the proportion of natives, and a decline and subsequent rise in the proportion of adults. In the components of population change, we everywhere notice a shift from in-migration to out-migration and, often beginning surprisingly early in the settlement process, a decline in fertility from a level which was initially very high to one approaching replacement. Finally, and perhaps most interestingly, opportunity - to find a job or to set up a farm - seems to regulate the timing of the process. This is not to suggest that the pattern was unvarying, that each region marched in lockstep through the process. Two temporal changes seem of special importance. First, the number of years over which the process occurs - from initial settlement to equilibrium - falls sharply from the seventeenth to the twentieth centuries, from something like 100 years in New England and the Chesapeake colonies, to roughly 30 years on the Minnesota Iron Range. Second, the relative importance of outmigration and fertility control in achieving zero population growth also changed: in the eighteenth century, outmigration was the principal means of preventing population from overreaching opportunities; in the twentieth, fertility control predominated. There are also important regional variations, especially between north and south, as well as the differences between the

behavior of slave and free populations. Nevertheless, evidence is accumulating that suggests a model spanning nearly 300 years of American history, a model that explains how interactions between individual choice and market forces at the local level continually joined to produce a recurring growth pattern. The next section of this chapter focuses on a central part of that interaction through an attempt to account for changes in the level of fertility on the Lake Superior Iron Ranges with a hypothesis that relates decisions about family size to employment opportunities.

Figure 3 presents an index of fertility - the ratio of children aged 0-9 years to women aged 15-44 - for several communities in the Lake Superior Iron Ranges: Virginia and Hibbing in St. Louis County, Minnesota, and Iron, Gogebic, and Dickinson Counties, Michigan. An index for the United States as a whole also appears to provide a context and a point of contrast. Close inspection of the figures suggests several issues worth exploring. The first is the relatively high level of fertility in the Iron Ranges in the late nineteenth and early twentieth centuries. Clearly, women in iron mining communities had many more children than the national average. Second is the sharp fall in fertility ratios on the Range: by the 1920s and 1930s fertility in three Michigan counties approached the national average, while in Virginia and Hibbing it was much lower than in the United States as a whole. Third is that the decline in fertility began at different times in the several places: first in Dickinson and Gogebic, then in Virginia, and finally in Iron County and Hibbing. The remainder of this section explores these three questions: Why was fertility in mining communities initially so high? Why was the subsequent decline so sharp? Why did it begin at different times?

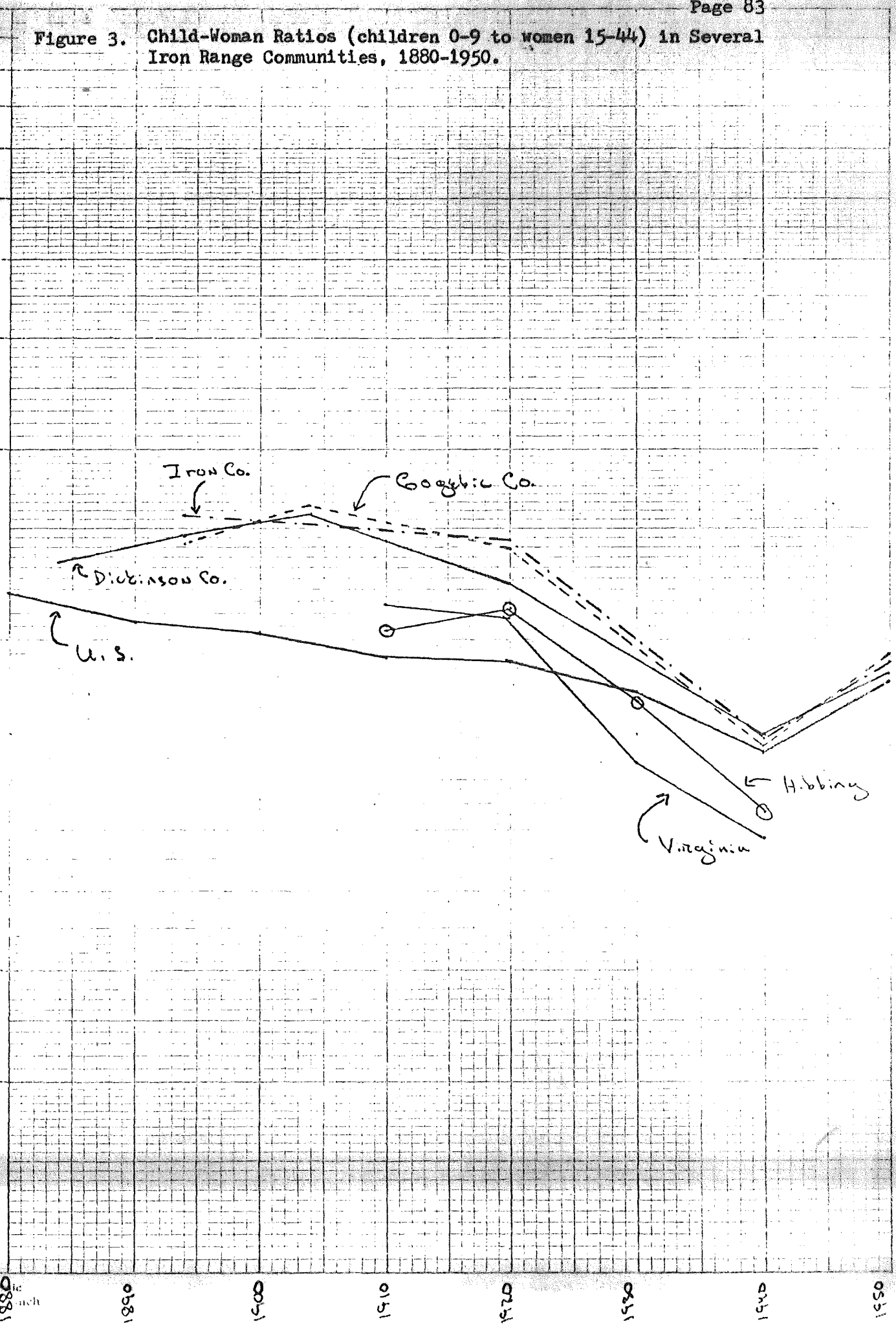
Why was fertility initially so high? Existing literature on

coal mining regions suggests that the specific structure of employment opportunities played a crucial role in producing the initially high fertility rates. Two factors in particular seem of central importance: the lack of employment for women operating through the sex ratio and the opportunity cost of child care; and the age-income profile of miners which encouraged them to marry early and have large families. Let's explore each of these in turn.

Women had few opportunities for income-producing work outside of the household in iron mining regions. Social convention dictated that they could not work in mines and the isolation of the regions meant that there were few other employment opportunities available. In consequence, the work force participation rate among women in iron mining communities was low. A survey of income and expenditure among families of iron ore workers in New York, Pennsylvania, Tennessee, and Virginia in 1889 conducted by the United States Commissioner of Labor provides some evidence on this issue. 162 families were surveyed. Wives were present in 160 of them, and of those 160 women only one was reported as working outside the home. Single women were only slightly more likely to find work outside of the home, as Table 8, which contrasts the work force participation rates of the sons and daughters of these 162 families, demonstrates. The argument is not that women failed to make a major contribution to family welfare (in addition to managing the household, most maintained small gardens, some poultry, and a cow or two, while 37 of the 162 families (23%) earned income from lodgers), but only that few found work outside of the home.

Given the lack of opportunities for women in the regions, the migrant stream was predominantly male and the sex ratio (males per 100 females) was high. Figure 4 presents sex ratios for the five communities

Figure 3. Child-Woman Ratios (children 0-9 to women 15-44) in Several Iron Range Communities, 1880-1950.



Semi-Logarithmic
2 Cycles x 10 to 1 Inch

Table 8. Work Force Participation Rates among the Children of Iron Ore Workers, 1889.

A. Sons

Age	Number	Number at Work	Number at Home or School	Status Unknown
10-13	32	3 (9.4%)	29 (90.6%)	0
14-17	24	20 (83.3%)	3 (12.5%)	1 (12.5%)
18+	8	6 (75.0%)	1 (12.5%)	1 (12.5%)
Total	64	29 (45.3%)	33 (51.6%)	2 (3.1%)

B. Daughters

Age	Number	Number at Work	Number at Home or School	Status Unknown
10-13	28	0 (0.0%)	28 (100.0%)	0
14-17	17	2 (11.8%)	13 (76.5%)	2 (11.8%)
18+	11	2 (18.2%)	8 (72.7%)	1 (9.1%)
Total	56	4 (7.1%)	49 (87.5%)	3 (5.4%)

Source: U.S. Commissioner of Labor, Sixth Annual Report (Washington, D.C., 1890).

Sex Ratios (Males per 100 Females) in Five Iron Range Communities, 1860-1950.

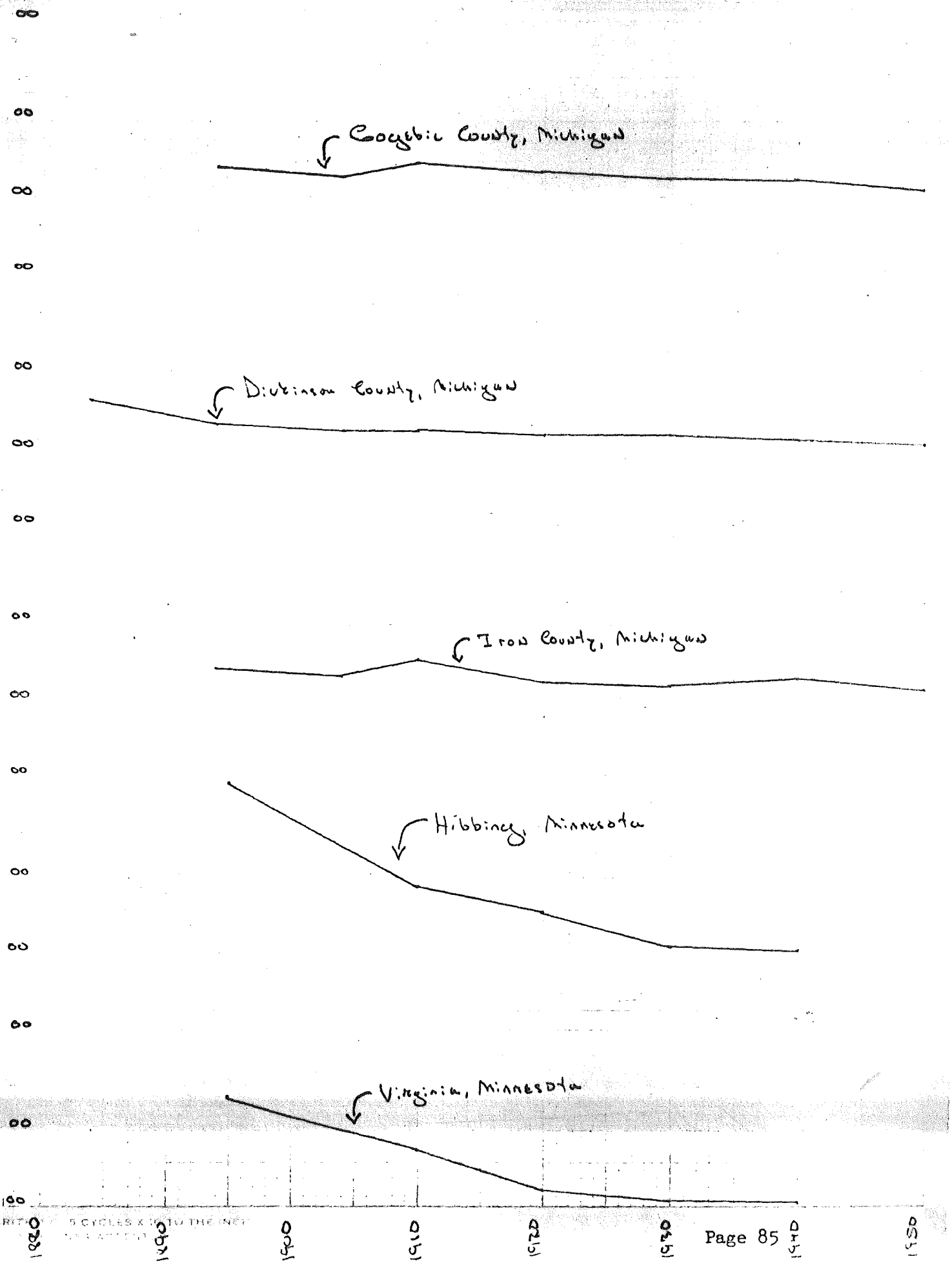


Table 9. Age at Marriage of Women in Michigan, 1883-1884, Selected Counties.

Age	Marquette Co.	Menominee Co.	Macomb Co.	Wayne Co.
Less than 20	68 (39.1%)	24 (44.4%)	44 (22.0%)	191 (26.9%)
20-24	74 (42.5%)	21 (38.9%)	110 (55.0%)	347 (48.9%)
25-29	23 (13.2%)	7 (13.0%)	26 (13.0%)	113 (15.9%)
30+	9 (5.2%)	2 (3.7%)	20 (10.0%)	59 (8.3%)
Total	174	54	200	710

Note: Those of unknown age excluded.

Source: Michigan Secretary of State, Census of Michigan, 1884 (Lansing, 1885), 1: 542-543.

Table 10. Age and Income among U.S. Iron Ore Workers, 1889.

Age	Number Workers	Mean Annual Income	Percent of Peak Earnings
10-14	5	$93.20	26.7%
15-19	4	$175.45	50.2%
20-24	15	$227.38	65.1%
25-29	36	$320.58	91.8%
30-34	37	$347.40	99.5%
35-39	24	$349.16	100.0%
40-44	15	$337.38	96.6%
45-49	13	$253.84	72.7%
50-54	6	$283.88	81.3%
55-59	4	$322.75	92.4%
60-64	2	$224.90	64.4%
65-69	3	$128.29	36.7%

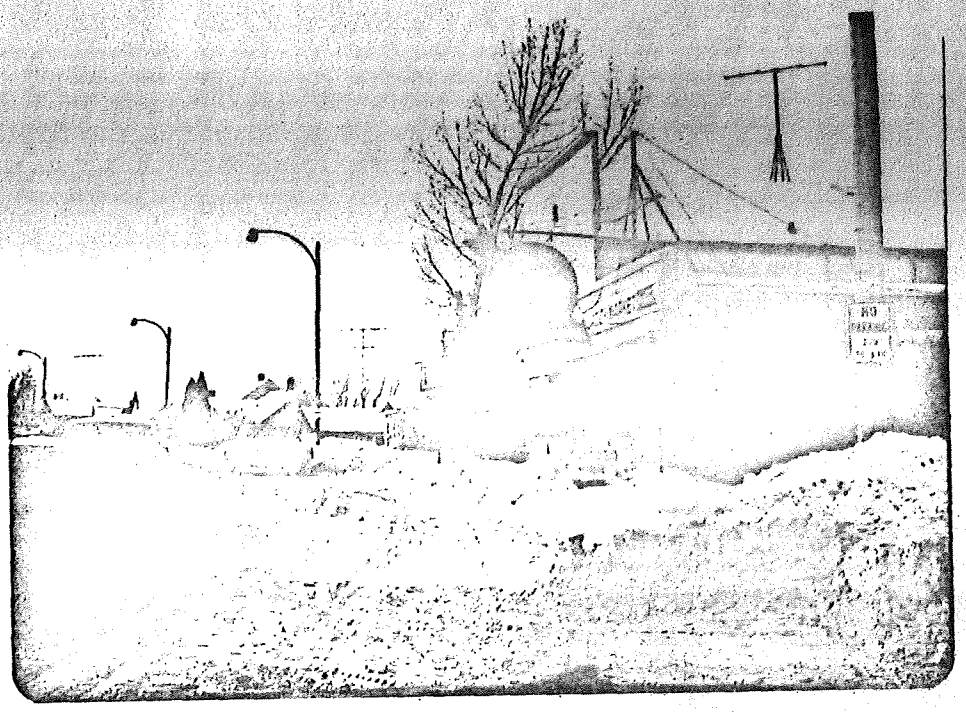
Note: Excludes Engineers and Blacksmiths. Assumes that sons worked in iron mines and that the son who worked was the oldest living in the family.

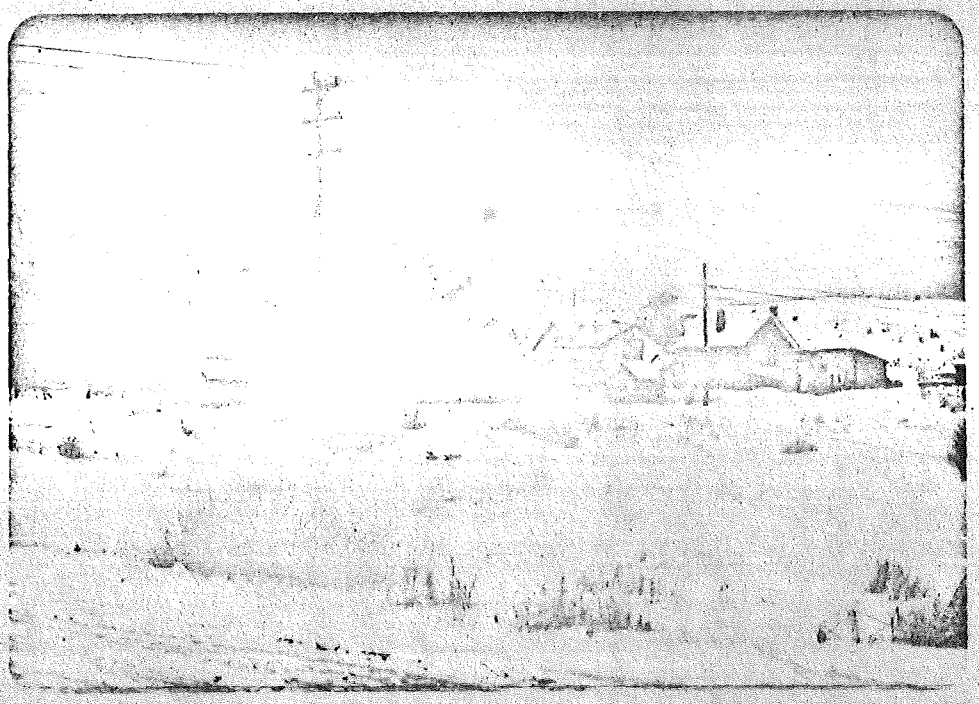
Source: U.S. Commissioner of Labor, Sixth Annual Report (Washington, D.C., 1890).

under investigation: all show a significant surplus of males in the late nineteenth and early twentieth centuries. Further, these data describe the sex ratios for the entire population; among adults the surplus of men was substantially higher. Sexual imbalance of such magnitude led to intense competition for marriage partners and, in consequence, a low age at first marriage for women. Youthful marriage was encouraged by the lack of employment opportunities for women: there were few alternative careers open and, given the inability of single women to find jobs, parents had little economic incentive to keep daughters of marriageable age at home. Our project has yet to generate much data on marriage practices, but some are available from the Michigan census of 1884. Table 9 contrasts age at marriage for women in two iron ore producing counties (Marquette and Menominee) with that in a largely agricultural county (Macomb) and in the state's most urbanized area (Wayne County). Clearly, women in iron ore regions were young when they married. Other things being equal, such youthful marriages would lead to relatively high fertility rates.

The lack of employment opportunities outside of the home encouraged high fertility in another way: the opportunity cost of child care was low to mining families. Since few women held jobs, bearing and raising children did not lead to a major loss of income. The contribution of the wife to a family's welfare - managing the household, tending the garden and the stock, and caring for the needs of lodgers - need not diminish if she had many children.

Table 10 presents an age and income profile for iron workers derived from the family budget survey described above. It shows that the earnings of miners reached a peak fairly early in their careers and then declined. This profile encouraged high fertility



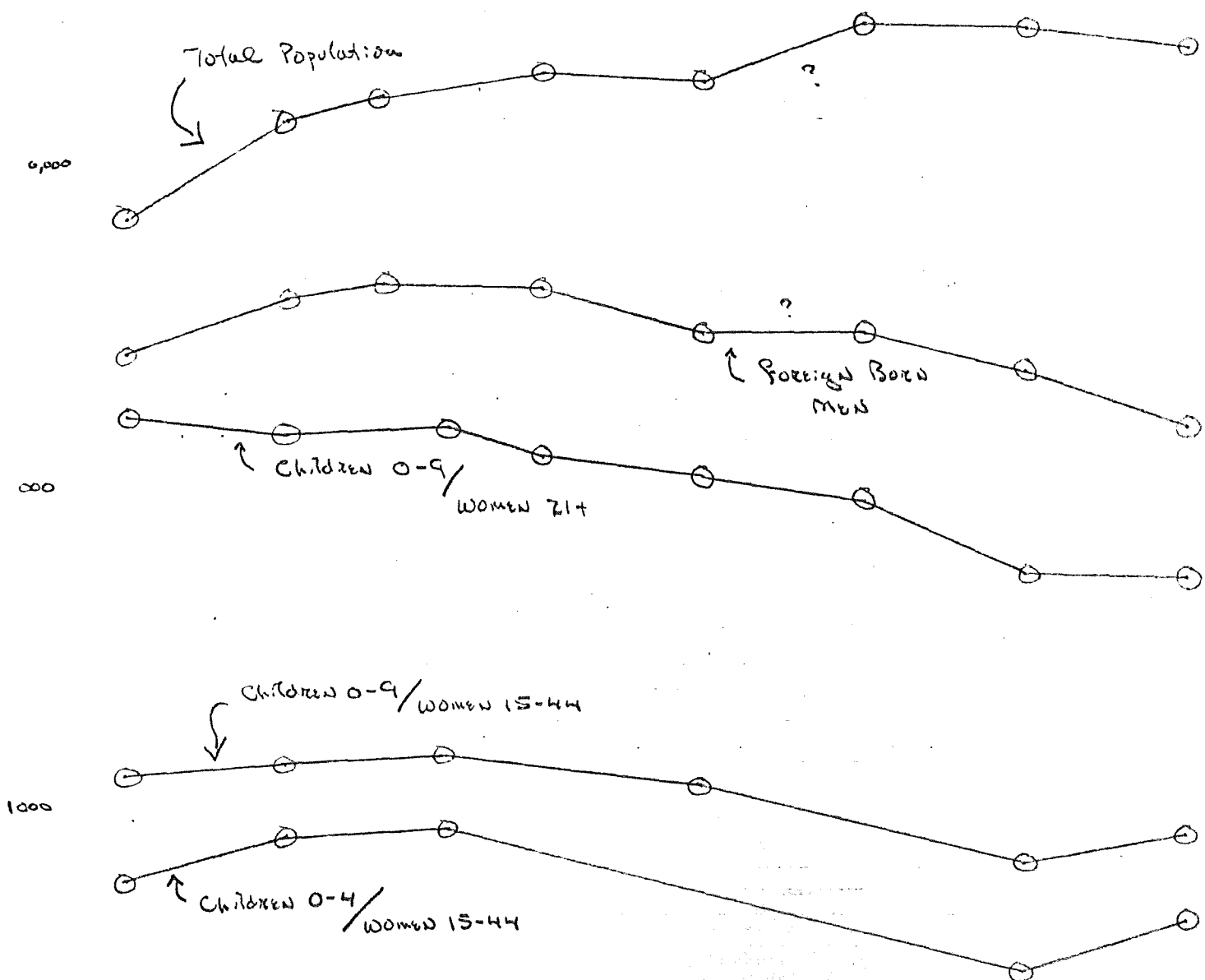


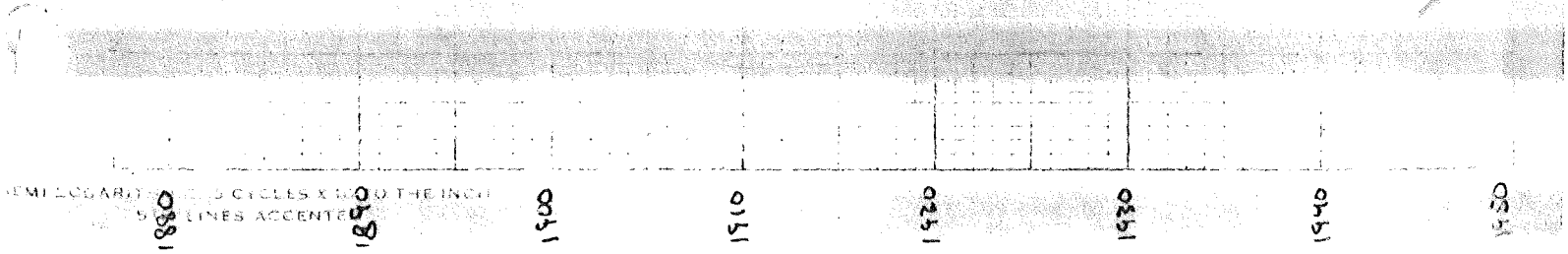
in two ways. First, since men reached their peak earning potential early, there was little incentive to delay marriage or children. Second, since wages tended to fall once a man reached his forties, there was an incentive to have large numbers of children as quickly as possible so that they mighttake up the slack in family income as the father's income began to fall. The importance of children as a form of social security is demonstrated by the family budget survey: 6 of the 25 families (24%) headed by a man between 35 and 39 years old reported income from children's wages, a proportion that rose to 33% (10 of 33) for families with the head of household in his forties, and to 43% (9 of 21) for those in which the head was fifty years old or older.

Why was the fertility decline so precipitous and why did it begin at different times in different places?

Figures 5 through 9 present several fertility indexes, the number of foreign born men, and total population for the five iron mining communities under investigation. We can take the rate of change in the number of foreign born men as a proxy for the net migration rate and the rate of change in the number of jobs in the area. (We are in the process of measuring directly both of these critical variables.) There seems to be a definite tendency for the decline in fertility to set in shortly after the number of foreign born males begins to fall. That is, <u>if</u> I am reading the as yet limited data correctly, the decline in fertility follows closely on the heels of a levelling off in the number of jobs in local iron mines. The specifics of the relationship between these two variables are still obscure and we need individual level evidence to pin the process down, but it is possible to offer a guess. If social security

⊙ = observation.





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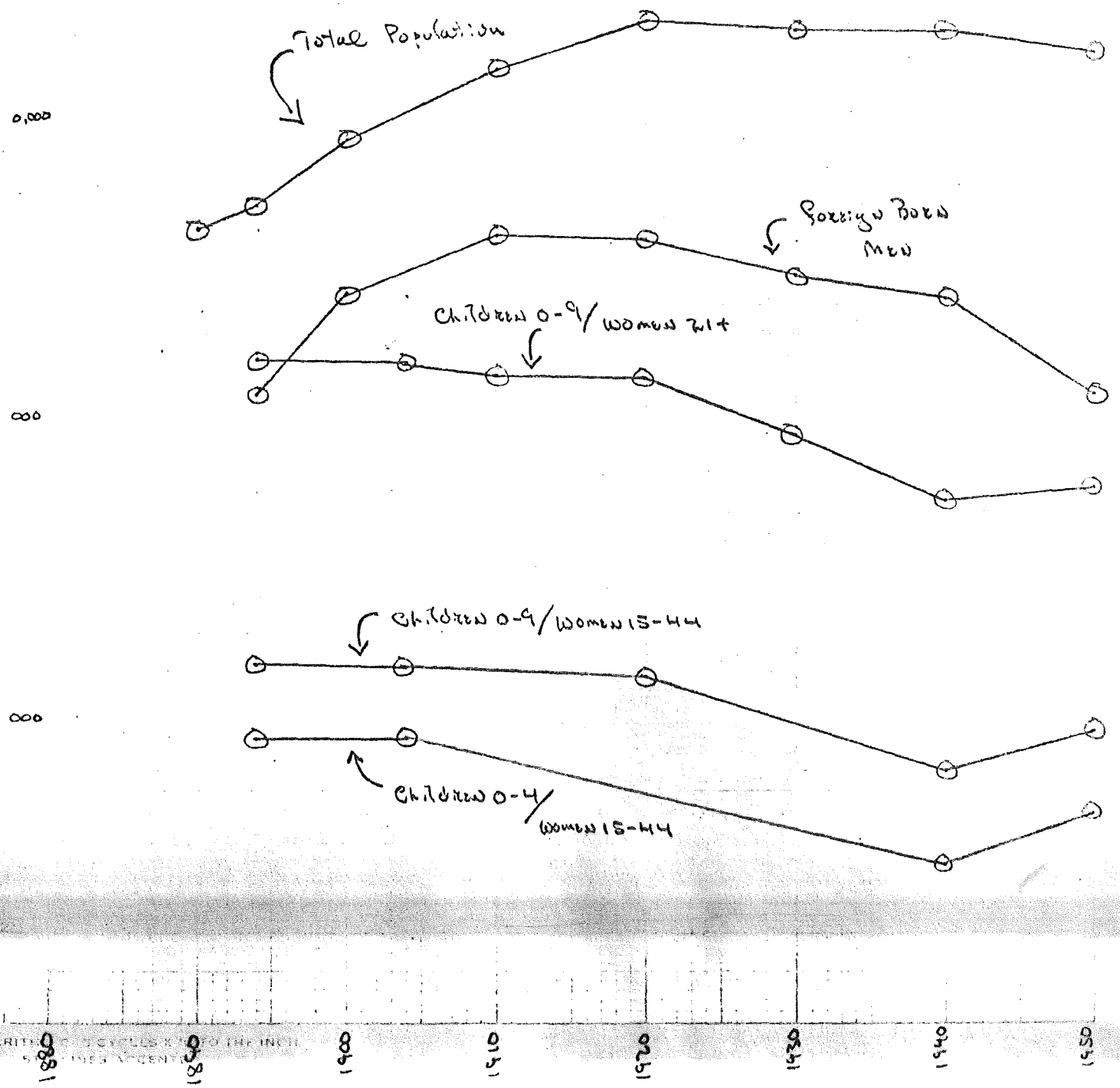

Gogebic County, Michigan

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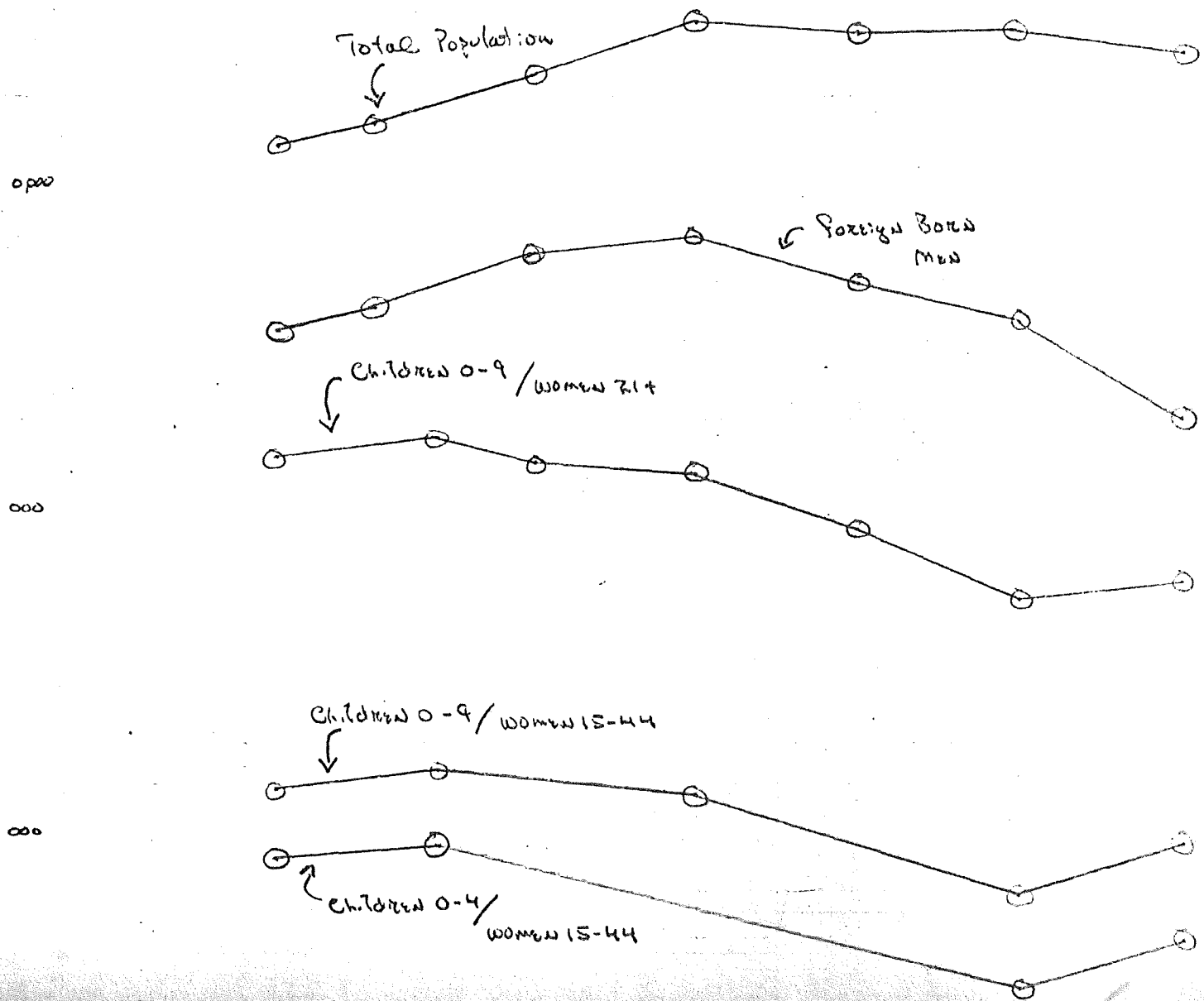

Figure 8

Virginia Minnesota

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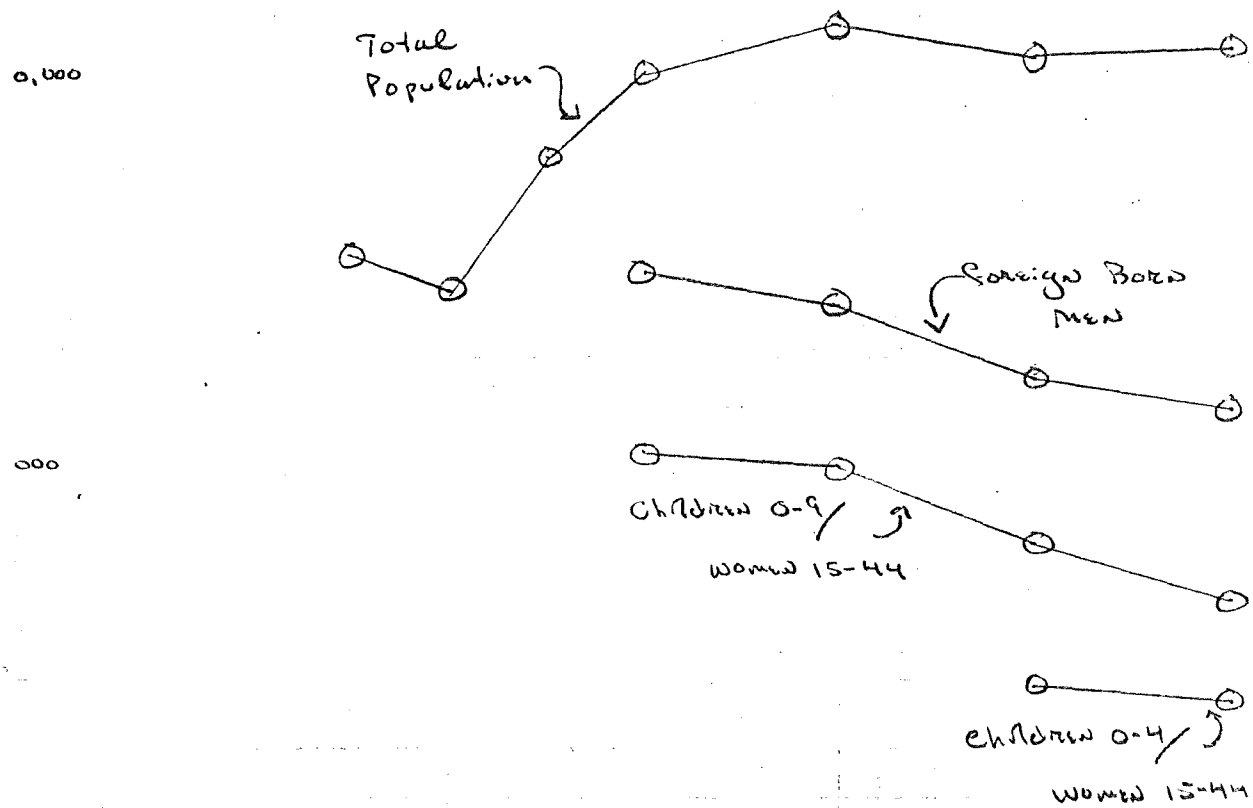

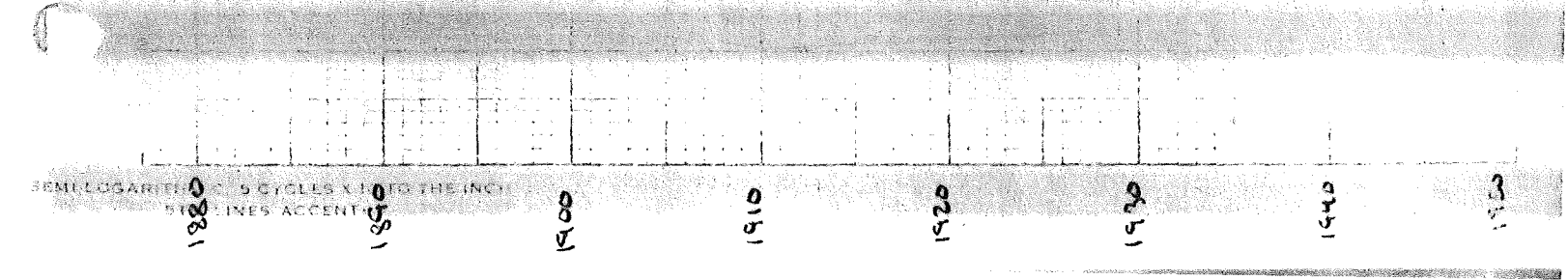

Figure 9. Hibbing, Minnesota

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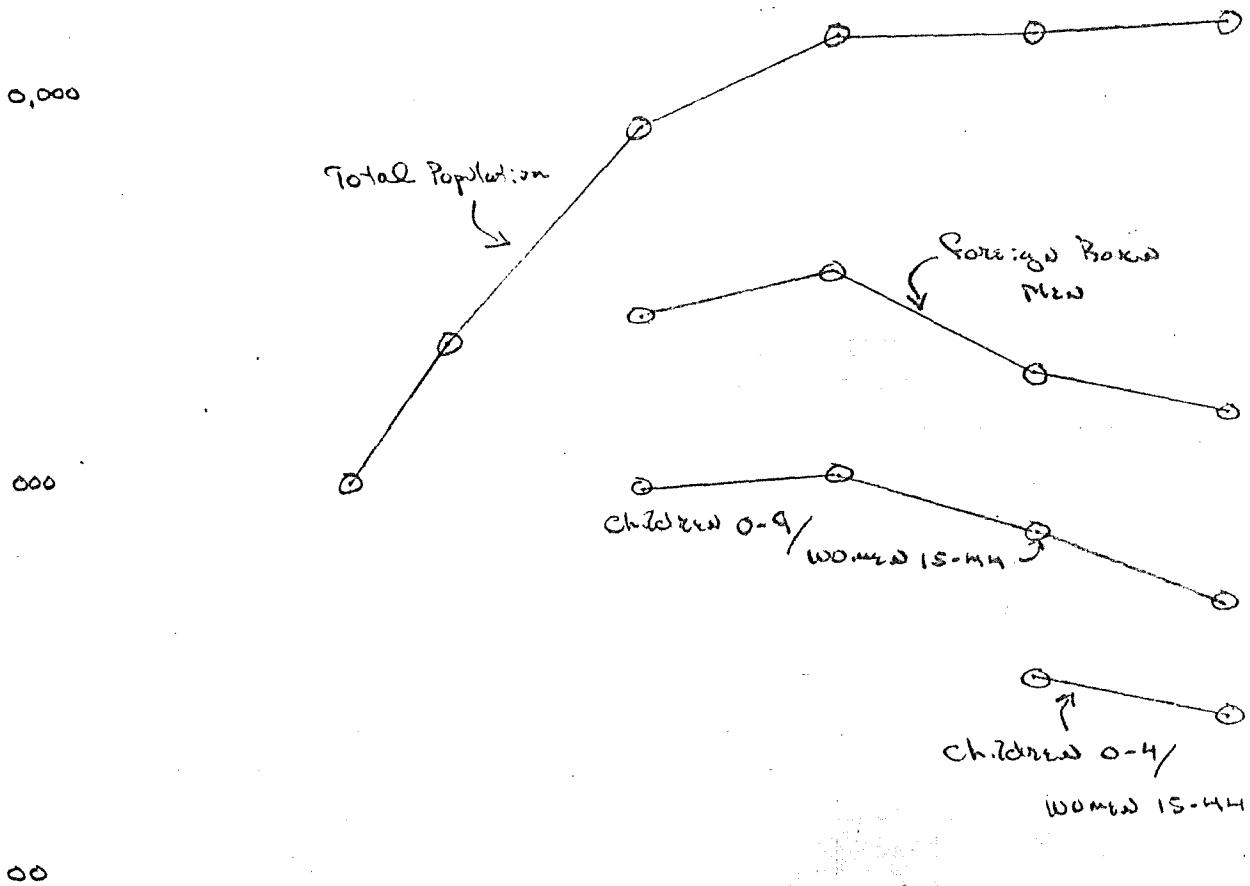

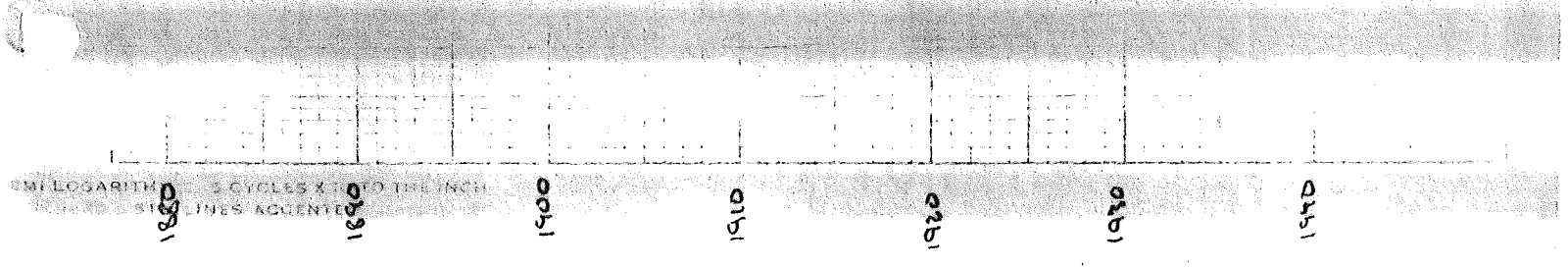

considerations played a major role in the earlier decisions of miners to have large families, the success of that strategy depended on a steady growth in the number of jobs in the area in order that sons could find work once they came of age. The strategy made sense only in an expanding economy. If there were no jobs to be had locally, sons would face a choice between migration and unemployment and neither alternative would augment family income. Since job opportunities levelled out in the several communities at different times, this would explain the variations in the date at which the fertility decline began. Whether it is also sufficient to explain why the decline was so steep awaits further investigation.

Of course this was not the only factor tending to depress fertility rates in mining communities during the first half of the twentieth century. Several other processes were at work as well, which, for analytical purposes, can be divided into two general categories: those affecting the United States as a whole; and those specific to the Iron Range. Among the former should be included: a decline in the costs, both psychological and economic, of fertility regulation; the increased efficiency of fertility control devices; a growth in a variety of consumer goods which raised the opportunity cost of children; and an increase in the cost of raising children, particularly as more and more education came to be considered essential. Among the latter might be included: the steady decline in the sex ratio which reduced the pressures for women to marry early; an increase in the size of the service sector of the local economy which created some jobs for women; and technological changes in the mining industry which reduced the proportion of unskilled jobs and changed the shape of the age-income curve among iron ore workers.

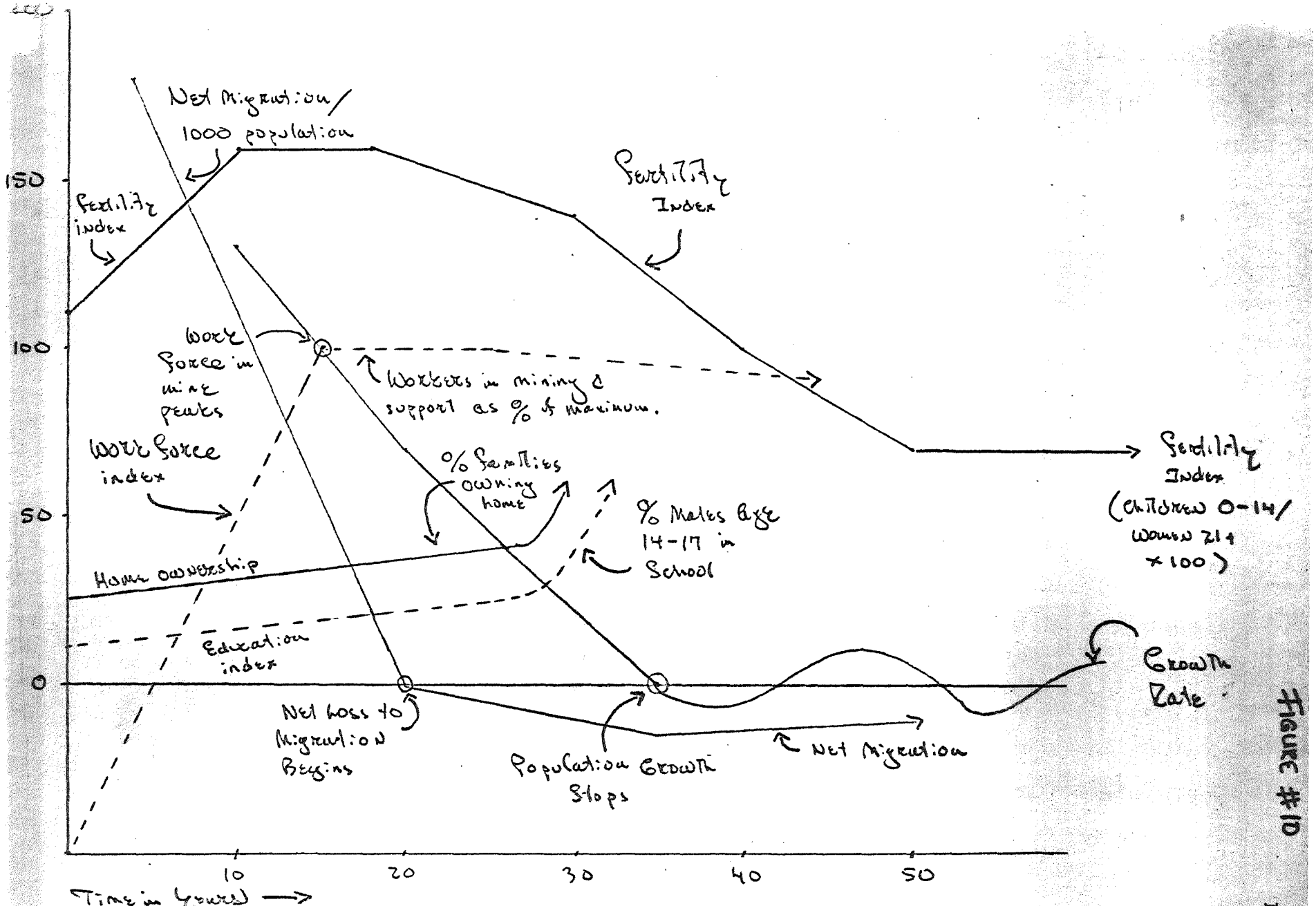

Figure 10 Opportunity, Fertility Decline, Education, and Home Ownership in a Lake Superior Iron Range Community, 1880 to 1940.

Figure #10

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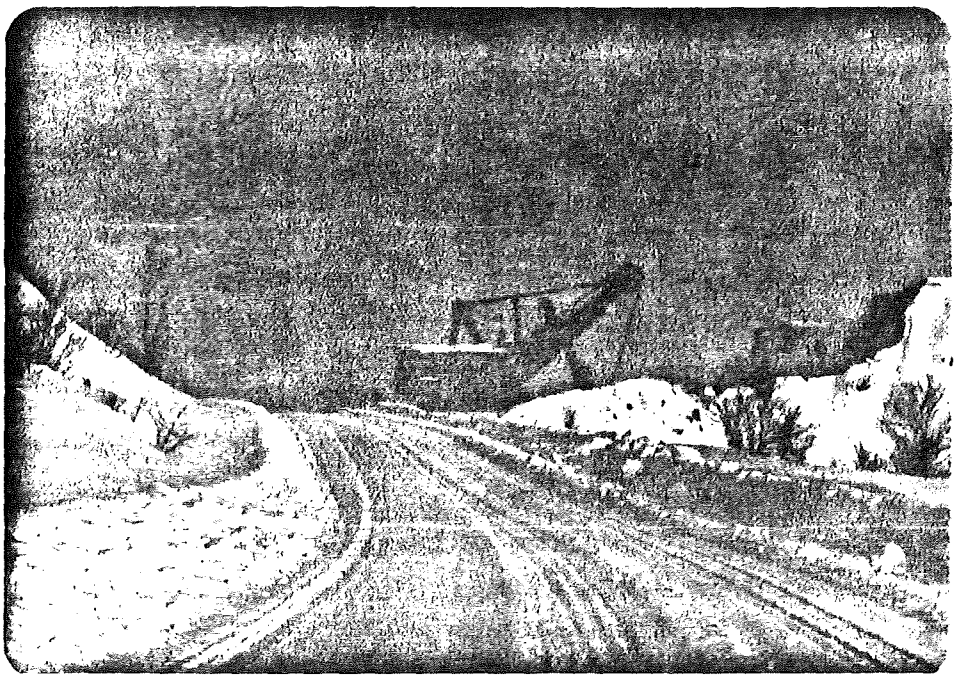
The final figure (Number 10) suggests that this process may be related to two other changes in iron mining communities noticeable in the early twentieth century: the increase in education and in home ownership. Given the growing difficulty of finding work of any kind and of finding unskilled work in particular, parents seem to have increased the amount of education provided their sons once the local mining industry stopped expanding. An increase in home ownership is also observeable shortly after the end of the expansion. This, I would suggest, may have appeared to couples as a substitute for large families as a means of achieving some degree of security.

The changes in family size may also have implications for the history of labor organizations, although for this I have no evidence whatsoever. However, if there is any validity to Selig Perlman's Theory of the Labor Movement, which argues the centrality of job security and income maintenance to union activity in the United States, it does not seem far fetched to suggest that workers may have viewed unions and large families as alternative means to the same end, and that, as external conditions rendered a private approach less effective, cooperative political activity became increasingly attractive.

Adequate demonstration of these propositions is beyond the resources of the present survey. The analysis demands extensive statistical testing, but as yet rests upon the visual inspection of a mass of data. It demands the direct measurement of certain key variables for which crude proxies are employed. And it demands examination of individual level evidence, while aggregate data have been the focus of this survey. Still, hopefully, this survey may succeed in demonstrating the potential of an approach to the history

of the various American frontiers and the history of the Iron Range in particular, that focuses upon the relationships between population growth and economic expansion and that uses opportunity, the point at which individual choice and market forces interact, as a means of connecting what appear as abstract and impersonal processes when presented as graphs and tables to the intimate details of human relationships.



SECTION IV

THE SOCIAL ORDER OF THE IRON RANGE

The first three sections of Part I, The Historical Analysis of the Iron Range, have scrutinized in detail the economic aspects of the development of the mining industry, the mining workforce, and the demographic characteristics of the total Iron Range population. The purpose of this section is to present a description of the social system that arose out of these economic and demographic realities and to describe and attempt to explain how this system persisted over time and changed or transformed itself in order to survive. This approach differs from the earlier sections in its emphasis upon the sociological, cultural, and political aspects of Iron Range history and the resulting dependence upon sociological theory and method to structure the analysis. Functional and historicist methods are employed, as well as thick anthropological description and traditional historical narration of certain sequence of events.

This proceeds in conjunction with the analysis presented in the first three sections and depends upon much of the data and evaluation accomplished there. The desired effect is to complement this neo-classical economic analysis and demographic analysis with substantive examples and actual historical developments to flesh them out, as it were, and provide meaningful examples of the forces described in the behavior of the Iron Range historical populations.

The primary objects of scrutiny in this section are the communities that developed on the Iron Range and the relationships between these communities and the workplace (the various operations of the iron mining industry on the Iron Range - as shall be seen the workplace differed greatly for different groups and even different communities), between the communities and the regional institutions that developed on the Range, and the institutions that developed within the communities and among subgroups within the various communities. 'Community' has geographical implications as it is used here and, indeed, most mining camps and villages on the Iron Range were, and to a great extent still are, self-contained communities. But these geographical units were also subdivided along socioeconomic, cultural or ethnic, and political lines. Thus, mining managers and supervisory personnel had ties that extended beyond their small camp or location as did members of particular immigrant groups, such as the Irish, Welsh, and Slovenes. These sub-divisions and their relations over time provide much of the human texture that has characterized Iron Range history. In various oral history interviews lifetime Range residents have spoke of many memorable things concerning Range life, but the community or location, was one that spurred universal memory. Through prosperity and depression, mining growth and decline, the community and location remained the centerpiece of a multitude of human emotions and aspirations. It seems fitting that the community

should be the main focus, therefore, of this analysis.

The creation of the physical plant of the various Iron Range locations and villages, how they were laid out and surveyed and how the land parcels were sold and developed, is an interesting process by itself. Surprisingly, very few of the towns were 'planned' communities in the sense that the mining companies took major resposnibility for developing the townsites. The creation of the original towns was primarily a free market process that was dominated primarily by real estate speculators and builders. Mining companies had, of course, a major interest in the provision of housing for their staffs and workers, but only ten communities out of 33 on the Iron Range were developed by mining companies. Two of these 10 communities, Babbitt and Hoyt Lakes, were platted in 1954 by two taconite firms, Reserve Mining and Erie Mining, respectively. The other eight company communities were Soudan, settled in 1882 but not platted until 1963, Tower in 1884, developed by Charlemagne Tower's Minnesota Iron Company, Buhl in 1900 by the Sharon Ore Company, Franklin Village in 1893 by the Franklin Iron Company, Coleraine in 1906 by the Hope Iron Company, Marble in 1908 by the Elba Iron Company, Taconite in 1909 by the Homestead Iron Company, and Leonidas in 1917 by the Rathbun Mining Company. These communities are among the smaller on the Iron Range and with two exceptions were creations of companies that were among the ranks of the smaller iron ore producers.

In the absence of planned company or corporate development, how were the communities planned? Surveyors contracted by Duluth-based land speculators would follow the iron ore prospectors through the iron mining country and would plat areas in proximity to major leases. If the leasehold was eventually developed by a mining interest the

land speculators would make lots available for sale in their platted townsites to workers, commercial entrepreneurs, and even other land apeculators. The process of building the various structures in the early communities was dependent upon the building skills of the early settlers and the availability of materials locally. Consequently, the earliest structures developed on the Iron Range were made of logs. Subsequent construction was also of wood but was predominantly woodframe, using finished lumber from mills in Virginia after it was established in 1892 and from other mills in the Vermilion Range. A series of fires in the 1890s and early 1900s destroyed several Range towns and locations and after these experiences, a movement to brick was made in most larger places especially in the central business and minor commercial districts. Many smaller locations and towns did not survive the early years of settlement and the remains of these early attempts at permanent strew the landscape especially of the East Mesabi Range, where towns like the now-deserted Mesaba serve as stark reminders of the risks involved in investing in the early development of the towns.

The major role of real estate speculators in the development of Iron Range towns was in harmony with trends in urban development in turn-of-the-century America. From cities like New York and Chicago to most smaller new town developments, real estate entrepreneurs played the same role. The proclivity of mining companies to remain outside of the process was also something of a characteristic of the period, although experiments such as Pullman were developed. The major reason for the lack of mining company involvement appears to have been the relatively small scale of the early operators and their relatively low levels of capitalization. Most of the early companies, it appears, had neither the capital nor skills to develop the townsites as well

as their mining operations. This trend changed somewhat after 1903 and the creation of the Steel Trust (now United States Steel Corporation). With the arrival of the corporation on the iron ore mining scene the larger mining organizations took a much greater interest in the local communities. Oliver Iron Mining Company, the subsidiary of U.S. Steel on the Range after its acquisition by the trust, for example, involved itself very much in the development of the commercial district of Hibbing and initiated several projects that led to the physical movement of a large part of the city in the early 1920s and to great involvement by the company management in the affairs of the city. The major interest of the iron ore mining corporations in the local towns and cities was the restriction of local taxation power of these municipalities. Many companies and corporations did provide housing for their workers in locations that were located near the mines and which were on company property. Because most of the corporate records related to these areas remained closed to researchers, however, it is impossible to describe their longevity and structures in detail.

The proximity of mining operations to towns and communities at first did not adversely affect either. This was especially true in the selective mines that were tunnelled underground along the Vermilion Range near Ely, Winton, Soudan, and Tower. When nonselective operations were initiated along the Mesabi Range, however, serious problems developed that had great effect on the early settlers. The ability of nonselective mines, both opencut and underground, to use great amounts of land restricted the ability of developers to generate profits amenable to them from standard lots. Smaller lots, as small as 25 feet on the front in Virginia, thus became the rule in Mesabi Range communities, and also on the Cuyuna Range after it was opened in 1910.

The implications of such small lots was of course a higher than average density of population and the greater use of urban area for ancillary mining purposes. As late as 1964, for example, 9% of the total area of U.S. cities was used for industrial purposes including mining. In the same year the average for incorporated places on the Mesabi Range was 18%, or twice the national average. In 1964 also there was thirty-three-thousandths of an acre per person in the city of Virginia, a little more than was available per person in the city of Los Angeles, California. The problem of high density was compounded by the living arrangements that were made by the great mass of unattached males who flocked to the mining communities to find work. In the first decades, as the housing stock was built and as the great imbalance between the numbers of males and females declined slowly, the great mass of men found shelter as boarders. Boarding was accomplished in private residences, with families taking in boarders to supplement their incomes, in commercial boarding houses, which were created by enterprising business men who often also owned hotels, saloons, and restaurants, and in cooperative boarding houses that were sometimes organized and run by various ethnic organizations as was true of the Pyrinto Association Boarding House in Chisholm. Because of the opportunities to gain income from boarders and because of the tendency to have large families, the miners built early on mostly 2 and 2½ story houses. This is clearly reflected in the housing that dates from the 1890s which stands in the Old Town/Finntown area of Virginia, an area that survived the destructive fires which wiped out most of the other original buildings.

The small lots, the large buildings, and the large numbers of people living in them, combined with the poor water and sewage systems

led to among other things a rather active disease environment. Typhoid fever and other diseases were rampant in the workers' sections of the mining towns where hygienic precautions and other prophylactic measures were not taken. In the city of Chisholm, for example, the drinking water was taken from Longyear Lake where raw sewage was also dumped. Things did not change until 1919 when an alternative water supply was tapped at a nearby mine and when a sewage treatment plant was built. The Chisholm situation typified most of the early communities in the failure to provide adequate facilities for these essential services. To this day, the communities on the Iron Range are rehabilitating their water and sewage systems with the assistance of the Iron Range Resource & Rehabilitation Board, an agency of the State of Minnesota that is concerned with regional development for the Iron Range.

A different set of residential structures, however, also developed in the Iron Range communities. While mining companies, lumber companies, and their service agencies were indifferent to the residential needs of their blue collar workers, they were concerned to the point of indulgence when it came to their managerial and administrative staffs. Fifth Avenue in Virginia and similar streets in Hibbing became elegant and lavish neighborhoods as multi-roomed mansions and three story houses were constructed in them. These homes were marked by stylish attention, great ornamentation on the exteriors, and were normally much larger than the average homes in the Range towns. The homes of the people who lived in the Range communities reflected not only the functional needs of the occupants, then, but also the social distance between the people who lived in them.

There were two other aspects of the physical development of the Range towns that should be mentioned. These are the commercial areas and the local political buildings. The commercial buildings, until the past twenty years, were clustered in central business districts. The highway, Number 169, for most of the Range towns, was usually also the main road through these districts, but in the larger towns such as Hibbing and Virginia, other thoroughfares such as Chestnut Street and Howard Street, developed. The commercial buildings in all of the Range towns provided essential services and a few luxury services and products to the local populations, but with the advent of mass transportation, beginning with the interurban railway line between Hibbing and Gilbert in 1912 and the use of the automobile after 1920, Hibbing and Virginia emerged as the major commercial centers along the Iron Range. This growth of the commercial, domestic sector in these two cities explains for the most part the larger population of these two towns than those of the other Range towns. In fact, the two towns were, and are still, three times as large as the next largest Range cities.

The public buildings along the Range are generally inobtrusive structures although again, Hibbing and Virginia are significant exceptions. The special prominence of these structures, in comparison with more modest structures of the early period as those found in Winton and elsewhere, reflect the fact that these public buildings were the arena of conflict and competition between the local elites of the towns and the top management of the mining companies and, especially, the corporations.

This summarizes the general physical development of the Iron Range townsites. One last point should be kept in mind, however, and that is that roughly speaking the trend of settlement along

the Iron Range was from east to west, so that the oldest settlements are those along the Vermilion Range in the east and the newest along the Cuyuna Range to the southwest of the Mesabi which lays between them. The exception to this are the two taconite mining communities that were constructed in 1954 along the eastern edge of the Mesabi Range. The next topic to be considered will be the process of settlement with emphasis upon the ethnic mix of the in-migrants and how that is related to the earlier analysis presented in Sections I through III.

As has been mentioned, the exploitation of the iron ore deposits in Minnesota began in the Tower-Soudan area in the early 1880s. The details of the process of opening are generally known and are detailed in numerous impressionistic histories of the area and the major personalities involved. The important factor for our purposes is that the mining workforce was drawn primarily from areas and sources outside the state, especially the iron mining areas in Upper Michigan but also from those in New York and Pennsylvania. This is not surprising because the migrants who came to the Vermilion Range were responding to new opportunities in mining, higher wages in a labor scarce area, and they had the necessary skills to take advantage of them. Also, there was no indigenous workforce to compete with them forthe new jobs that were created.

I should mention that iron mining at this early period in the 1880s was very different from what is would later become and from what it is today. The key differences are (1) that the mines and workforces in individual enterprises were relatively small and (2) the miners themselves controlled the rhythym of work. These factors were very significant because it implied a very fluid economic situation which presented a great deal of opportunity for would-be entrepreneurs and also that the workforces of the operations were small, compact groups

that had relatively similar skill levels and were in need of very little supervision in the course of their work as special skills in selective mining were superfluous. The iron ore removed from the mines tended to be high-grade ore that required no processing, or beneficiating, before being shipped directly to a buyer. The skilled selective iron miner knew how to dig tunnels, knew how to build supports of wood for them, and knew how to identify the quality product and remove it from the workface. Needless to say, the miner was a crucial element in the production process.

I mention this because the skills possessed by by the in-migrants in this early period determined their accessibility to the iron mining labor force. Because selective mining skills were concentrated among groups with traditions of association with mining over several generations, in both Europe and America, these groups with these long traditions of association tended to enter mining in the United States, and in Minnesota, in larger numbers than did other groups. The compactness and small scale of workforces in the early selective mines on the Minnesota Iron Range enabled the in-migrants to be very selective in their absorption of new migrants and, although we have not generated the evidence necessary to specak with certainty, they probably tended to hire persons with whom they had prior experience or knowledge. The maldistribution of skills among the various immigrant groups explains in large part why some groups, especially the Welsh, English, and Irish, dominated the Minnesota mining labor market in Minnesota at this time. After the growth in demand for iron ore after 1894 and the opening of the Mesabi deposits after 1892, however, this situation changed dramatically.

Between 1892 and 1890 the number of workers in the Minnesota iron mines increased from approximately 700 men to a little more

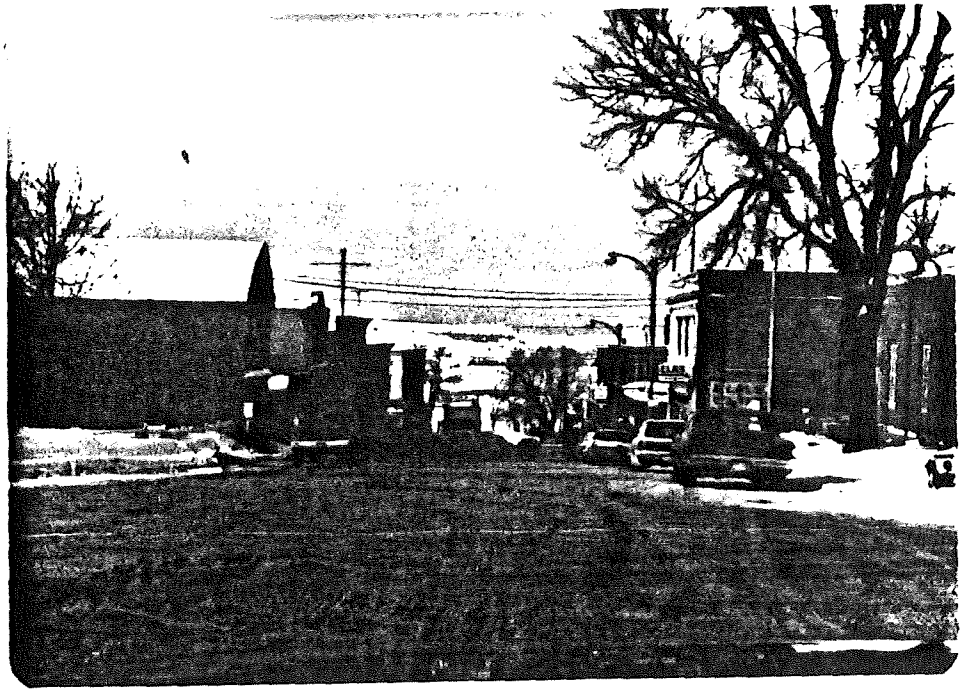
more than 1700. Between 1890 and 1900, however, the number increased to more than 8,000 - eleven times the 1882 number and four times the 1890 number. The output of the mines increased from 62,000 tons in 1884, to 880,000 tons in 1890, and to 9,465,000 tons in 1900. While the number of workers increased eleven times in the period up to 1900, total output increased 150 times in the same period of time. The increase between 1890 and 1900 alone was ten times the earlier output. This growth in the output and workforce reflects the impact of many factors, including the discovery of the rich Mesabi deposits. It also reflects, however, the development of a major new trend in mining methods. This trend was the movement away from the selective mining of ore by skilled underground miners toward nonselective mining which emphasized mechanized removal of the ore and the material around it and the later processing of the ore to remove the gangue, or non-iron materials.

The switch from selective to nonselective mining methods was a drawnout process which took several decades to complete. The rate of the change was affected, in turn, by several factors including: (1) the development of heavy machinery, especially the power shovel, but also heavy trucks and electrical pumps and generators for a variety of electrically-powered machinery, including trains; (2) the rate of depletion of the higher grade ore deposits; and (3) the development of suitable nonselective mining methods for underground operations, especially block caving, sublevel caving, topslicing, and shrinkage stoping. Nonselective mining methods also required a larger scale of operations and higher levels of capitalization than was the case prior to 1900. Thus, the penetration of the corporation, with its ability to generate great amounts of capital for investment and its ability to manage large-scale operations,

greatly accelerated the movement toward nonselective mining.

The impact of nonselective methods upon the iron mining work force and labor market was great. The changeover made the once highly valued skills of traditional miners less valuable, if not worthless, in both open cut and underground mining. The process of removal of high grade ores by the miners was displaced by the removal of all of the ore-bearing material. Where once all the miners in a workplace were equally skilled there developed a new workforce that was for the most part unskilled. The highly skilled workers in the new nonselective mines were heavy equipment operators, heavy machinery operators, and mechanics, as well as clerical types, administrators, attorneys, accountants, and engineers. While the traditional 'hardrock' miner lost the value of his skills he also lost whatever autonomy in the workplace that he once had. The studies of engineers and the calculations of accountants and marketing specialists now determined the pace and direction of the work that was undertaken. The unskilled miners shorn of their compact, homogeneous workplace, now laid track, oiled equipment, tended rail cars and trimmed them when filled with ore, unloaded fuel, dug trenches, built walls for tailings ponds and slag dumps, maintained trestles, and so on, but did so at the direction of the mine managers and foremen who alone knew the overall plan of mine development and workings.

While the changes in the workplace were very drastic it appears from the wage data presented in the second section of this analysis that there was an exchange that tool place. The skilled miners of the selective era of iron ore mining exchanged their work situation for higher wages, basically. They also exchanged the uncertainties of employment in a fluid market for the more certain chances of employment in a labor market dominated by large corporations. On the surface,



this may appear a contradiction considering the data presented earlier relative to annual employment figures and the general trend of decline in total employment in mining. The fact is, however, that the decline in positions strengthened the prospects for longterm employment for the men who found work in the mines. This was reinforced by the tendency to bestow higher skill levels on the workforce as the use of expensive machinery increased as it has into the late 1970s. The workers were subjected to cyclical unemployment before the advent of the corporation and nonselective mining, a severe constraint when one looks at the impac- upon workers of the 1873 and 1893 depressions, and the more frequent minor recessions and panics that often put the iron and steel industry into turmoil. After the advent of the two phenomena, the impact of cyclical unemployment was reduced somewhat at least until the depression of 1929 which ended corporate control (solely) of labor relations within the industry. Seasonal employment, however, became something of the rule after the advent of the nonselective system. This was the result of the nature of relationships between the producers of the iron ore and the larger iron and steel producers that owned them. The production schedules of the mining interests such as the Oliver Mining Company, the U.S. Steel subsidiary, were in effect determined by the producers of iron and steel. The mining companies and their work forces and products became elements in a complicated equation in a very competitive industry.

This situation led to some rather severe strains in the relations between workers and management that led to some of the more bizarre and certainly more unpleasant aspects of Iron Range history. The local mining executives were in a position of dependence that made it necessary for them to manage their operations with a degree of precision that was unheard of in mining before the twentieth century.

This dependence of the Iron Range managers upon their corporate offices in Cleveland and Pittsburgh and their accountability to them made the regional managers very rigid in their dealings with labor. Union organization was, of course, an untolerable development for them. Consequently, one of the major activities of management in the period between 1904 and 1941 was obstruction of efforts on the part of the workers to organize unions. This campaign was waged relentlessly in the workplace and in the community. In the workplace organizers were sought out and discharged upon discovery and blacklisted, as were card carrying union members. In strikes, which occurred in 1907, 1916, and 1919, civil authorities were used to keep access to the mines open and strikebreakers were used with ease. Such practices were common in labor relations in the United States before revolutionary legislation and court decisions in the 1930s reversed the trend. On the Iron Range, however, such practices had rather drastic effects because of the paucity of alternative livelihoods. The effort to identify union members, organizers, and sympathizers extended into the community as was alluded to above and resulted in the use of spies and informers by the mining corporations to identify, isolate, and neutralize these elements in the mining communities. Unfortunately, corporate records on this delicate subject remain closed but the informative Spies in Steel, a book written by an enterprising journalist who obtained temporary access to the mining company records in the 1920s, gives an authoritatively sounding description of the how the anti-labor campaign was prosecuted.

The point of discussing the mining companies' activities in this respect is not indict or accuse, although there appear to be substantive grounds for doing so even by neoclassical economic standards of judgement.

The point is that the mining companies' efforts had a very adverse effect on community relations in that they poisoned trust between groups and broke down longterm associations. In the 1920s this had the effect of exacerbating ill-feelings between native born and foreign born, between immigrants from northern and western Europe and those from southern and eastern Europe, and between Protestants and Catholics. This hostility reached an apex in the anti-immigrant Americanization movement of the first half of the Twenties. The social disruption caused by this period of activity was not healed until the achievement of unionization and the movement of southern and eastern European immigrants and their descendants into positions of authority in unions, established in 1937 and afterward, and in politics. Before examining these ethnic and cultural rivalries in detail, however, it is necessary to examine briefly how the ethnic mix on the Iron Range was achieved and how it contributed to the early development of the Iron Range society.

The change from selective to nonselective mining is crucial to any understanding of the changes which occurred in the ethnic composition of the iron mining workforce. It was, in fact, the great growth in the demand for unskilled workers that occurred between 1890 and 1914 that facilitated the entry of Finns, Slovenes, Croats, Italians, Serbs, and sundry other groups into the iron mining regions. The way that this occurred was, to put it simply, was that these immigrants needed work when it was available in iron mining, had no skills as none were needed, and were able to take advantage of the opportunities as they presented themselves. The more skilled miners found it rather easy to remain in mining and move into the supervisory capacities in the mines that were being opened up. Much of this is speculative because of the lack of data to support it, data that is contained in employment

records of the mining companies. However, it is difficult to comprehend the process in very many other ways.

For the unskilled miners the key point of their entry was the coincidence of their arrival in the U.S. and the availability of positions in mining. This was very important for two reasons. First, and obviously, it made it possible for them to enter the iron mining regions. Secondly, and less obvious, the initial timing of entry of certain groups made possible the concentration of some ethnic groups rather than others. The demand for unskilled labor made possible the entry of several groups, but the demand did not continue to grow indefinitely. After 1900 the number of jobs in iron mining began to decline on the Vermilion Range and after 1908 the same decline began on the Mesabi Range. The overall trend was offset for awhile by the opening of the Cuyuna Range around 1909 but that area also began to lose jobs after 1921.

I should make clear that I am talking about peak employment figures when I say that the various ranges began to decline. As was indicated in Sections I and II, because of the productive capacity of the nonselective mining methods, especially those with open cut mining, the annual production of the region began to increase despite the decline in the number of workers. During World War II, for example, in 1943, when preexisting production records were shattered, 14,809 miners in the Minnesota mines produced 69,000,000 tons of iron ore. In 1911 and 1912, at the peak of employment with 23,000 miners, Minnesota mines produced only 23,000,000 tons of ore. The iron miners of the 1940s were producing 4½ times more iron ore per worker than they were in the year before World War I. And even higher productivity records were established after World War II.

The point is that in the face of this decline of demand for

unskilled labor the immigrant groups that were best established had the greatest potential for continued growth as they were best equipped to compete in the mining labor market for scarce new jobs that were annually becoming scarcer. This phenomenon characterized the entire U.S. labor market in the period between 1890 and 1914. The 1890s and 1900s were in fact a transitional period in U.S. immigration patterns generally. This transition has usually been delineated in ethnic and racial terms as observers early on noticed that southern and eastern Europeans were beginning to constitute the majority of new immigrants, displacing northern and western Europeans from the immigrant mainstream. Coincidentally with this shift the skill levels of the new immigrants also shifted downward. The greater part of the new immigrants had no indsutrial skills and were, on arrival, concentrated in the unskilled industrial labor market. The unskilled immigrants such as the Finns, Slovenes, and Poles, were responding to the growing opportunities for unskilled labor that were developing in the United States. As we have seen in the case of iron mining, there was a major shift in this period in mining methods which rapidly created a large number of jobs at very low skill levels. It was at this point that the southern and eastern Europeans began entering iron mining. What I would suggest is that similar changes in the mode of production affected a great many production industries at the same time. For example, the assembly line revolutionized the work in automobile production, meat processing, iron and steel production, and the assembly of electrical appliances. The resulting demand for unskilled labor in these and myriad other industries explains in large part the influx of diverse, new ethnic groups.

The general growth of demand for unskilled labor goes far in

explaining the volume of the 'new' immigration as it was called, but does not explain the concentration of particular groups in particular places and industries. The explanation I offer here has three parts. The concentration of certain immigrant groups in certain places and industries is the result of the (1) timing of the immigrants' entry into the U.S. labor market, as has been indicated; (2) the pattern of social relationships among the immigrants in a particular group; and (3) the nature of the particular group migration. By timing of entry into the labor market I mean the coincidence of entry of the migrant group and the development of opportunities in a given industry. If Finns had not begun to migrate to the United States until after 1910, for example, it is doubtful that they would have been able to concentrate in the iron mining regions around Lake Superior as they did. The pattern of social relationships among the immigrants prior to their migration would greatly influence their interaction in the new environment. Strong kin and village ties could be expected to increase immigrant solidarity and capacity for cooperation. This is closely related to the third part of the explanation which is the nature and intent of the overall migration. While there was a shift to less skilled immigrants after 1890 there was also a tendency for more of the immigrants to remain in the United States for shorter periods of time. It appears that the unskilled immigrant was motivated by short term goals to a greater degree than was the case for previous immigrants. If large numbers of a group did not remain in the U.S. it would obviously affect the nature of the remaining community.

The larger groups of immigrants on the Iron Range entered the iron mining labor market at the appropriate time, had the appropriate social cohesion to increase their numbers, and had generally longterm

goals relative to settlement. The Finnish pattern of settlement on the iron ranges of the Lake Superior District exemplifies the success of a regionally oriented group that turned the area into the major area of settlement for Finns in America. Not surprisingly the Finnish community on the Iron Range, as a result, developed the most complex array of social, political, economic, religious, and educational institutions of any immigrant group on the ranges. These institutions, based upon the needs and interests of myriad local groups of Finnish immigrants, provided a great deal of services and goods and social cohesion to the large population that they served. Deservedly the Finnish settlements and their institutions and history have received a great deal of attention in the last twenty years or so and the literature is rich and diverse. To compliment that work we shall examine a group that has received comparatively little attention. This group is the Yugoslavs.

The Yugoslavs are not in fact a single cultural, linguistic, or religious group. They are, rather, five separate groups which are the Slovenes, Croats, Bulgars, Serbs, and Macedons. The Slovenes and Croats are primarily Roman Catholic in religious affiliation and they have their own respective languages, while the Serbs, Bulgars, and Macedons are primarily Orthodox Christians, also having their own respective languages. To further complicate matters, a large number of Serbs and Croats have been adherents of Islam for several centuries - a development associated with the Turkish conquest of the Balkans in the fourteenth and fifteenth centuries. A diverse and complex political and socioeconomic history also distinguishes the Yugoslavs. We must limit our appreciation of this history to a few central observations, however. First, the great majority of Yugoslav

immigrants to the United States came from the Dual Monarchy of Austria-Hungary. Second, these migrants came overwhelmingly from rural, agrarian backgrounds as opposed to urban, manufacturing ones. And, third, the Yugoslavs came primarily in the period 1900 to 1914, especially Serbs and Croats, although Slovenes began to come in the late 1880s and early 1890s.

The Slovenes were the first Yugoslavs to come to the Minnesota Iron Range. They began arriving in the late 1880s and early 1890s and, from their own accounts, they came from the iron and copper mines of Upper Michigan and not directly from Europe. It appears that these Slovene migrants had skills appropriate to selective iron mining and thus were able to find employment in the underground mines around Tower and Ely, on the Vermilion Range. In retrospect, in the 1890s it appears that the Slovenes were destined to become a major segment of the Iron Range population. The first national Slovene newspaper, Amerikanski Slovenec (American Slovene), was initiated in Tower in 1894. The first national Slovene immigrant organization was organized in 1896 and its first president and half its initial membership were from the Vermilion Range. The Slovenes established a planoply of local organizations in various Range towns and even created a Slovene language library and reading room in Ely in 1897. The Slovenes established seven Slovene Catholic church parishes across the Range between 1893 and 1912. In spite of these promising beginnings, however, the Slovene community stopped growing between 1900 and 1910 and was overshadowed by the much larger Finnish immigrant population by the later date. Two factors seem to explain this. First, the selective mining skills of the Slovene miners, which were acquired in long traditions of metal mining and coal mining in Europe as well as in the United States, and the edge these skills gave to

them in the U.S. labor market were undermined by the basic changes in the iron mining industry. It is impossible to demonstrate from the available evidence but it seems possible that Slovene immigrants who possessed these skills and who came after 1900 found greater opportunities in coalmining and other types of mining where selective mining was still employed. Secondly, the growth of the total number of jobs in iron mining ceased after 1910 so that opportunities for all groups were being restricted after that time.

The somewhat abrupt end to the growth of the Slovene community on the Range made its further institutional development and diversification, as occurred and continued to occur among the nationally most significant Finnish population, somewhat difficult if not impossible. The lack of new jobs in mining made it difficult for the immigrants to invite kinfolk and fellow villagers to join them and so the reconstruction of kin and village relationships characteristic of their communities elsewhere was stunted. This was, of course, a selective process so that some families and village groupings were more represented in the community than were others. In fact, most of the Slovene population was male. In 1910 there were approximately 225 Slovene males for every 100 Slovene females. By 1920 the number of males per 100 females declined to 170 and by 1930 this was reduced further to 150. While these figures are not age-specific and not completely reliable in delineating specific patterns, it can be assumed that it reflects a large number of unmarried or unaccompanied adult males present in the Slovene population. The continuance of this trend beyond 1930 cannot be measured because of the nature of subsequent census data, but the longterm overabundance of males had two implications. One is that these men would have to marry outside the ethnic group

if they were to remain on the Range and wished to form families. The other is that to maintain group cohesion the immigrants had to develop a social mechanism to deal with the longterm, awkward male/female imbalance.

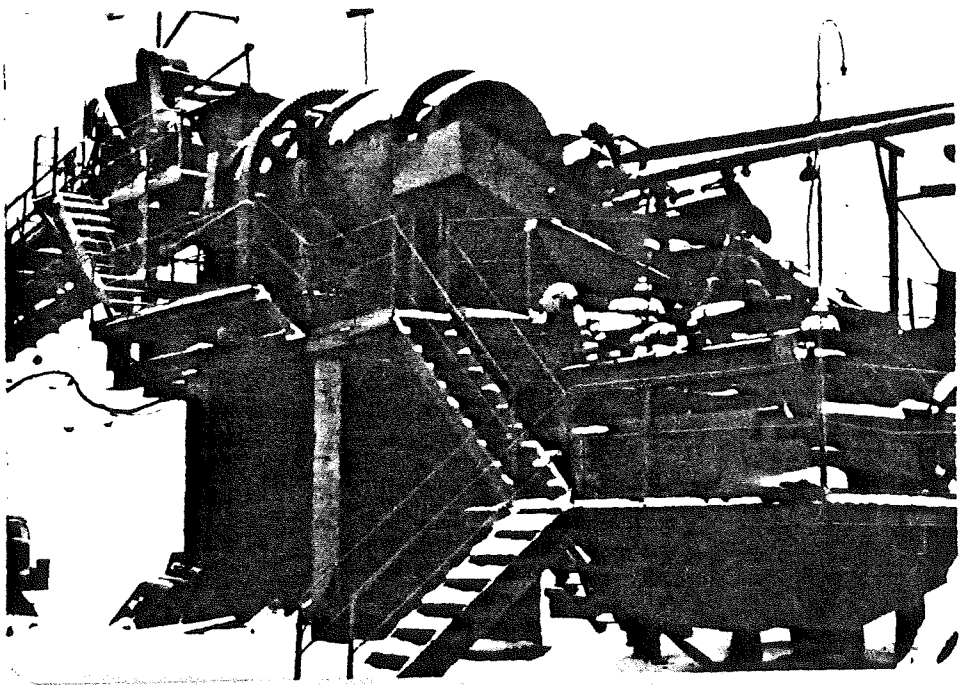
Before speculating on the social mechanism that was developed it is necessary to explore further the decline of the Slovene community before 1910. The changing nature of labor relations in the iron mining industry after the advent of the corporation also, I believe, played a major role in the decision of Slovene migrants to find the Iron Range less desirable than it once had been. The Slovenes were very much involved in the Iron Range strike of 1907 which was officially organized and sponsored by the Western Federation of Miners. Only the Finns had greater absolute participation and proportionally the smaller Slovene group had equally high participatory rates in the walkout of that summer. In the aftermath of the strike, however, the Slovene strikers who were blacklisted by the mining companies as ardent unionists could not return to the mines as could not many Finns in similar straits. The Slovenes could migrate away from the Minnesota Iron Ranges to other centers of Slovene settlement in other parts of the United States in other industries, especially coalmining, however, to avoid the adverse effects of the blacklist. The Slovene community on the Range, therefore, experienced a loss of longterm residents as a result of the strike of 1907. The blacklisted Finnish strikers, on the other hand, could not migrate to other major areas of Finnish settlement because the Lake Superior region was their major area of settlement. There were other Finnish settlements in Oregon and Massachusetts but these settlement areas and the industries that supported them could not absorb the large number of Finns that were very seriously affected by the Range strike of 1907. These immigrants

had only three avenues of action open to them. They could return to Europe, they could migrate to other parts of the United States on their own devices, or they could remain in proximity to the Iron Range and make their way as best they could. From the existing Finnish historical literature it appears the majority of the black-listed Finns chose to remain in proximity to the Iron Range. Thus began their great saga of attempting to eke a modest existence from the barren earth of the Range area in agricultural pursuits. The point is that while strength in numbers and institutions offered some social and economic advantages, the same strengths could become serious weaknesses in the face of very adverse circumstances. The inverse is true also for the smaller groups like the Slovenes. While being a smaller migrant group hurt them in competition for jobs it also provided them with alternative choices in greater number in the face of adversity. With this point in mind let us now return to the question of how the Slovenes dealt with the problem of the male/female ratio imbalance.

Nothing is known about age at marriage for the total Iron Range population let alone for individual groups like the Slovenes, so it isn't possible to speculate about marriage patterns for them or anyone else at this time. We do know something about the development of social mechanisms and what we know leads us to the saloon and the boardinghouse system. The saloon provided the single adult males with a social center and the taking in of boarders provided them with what one scholar has called 'surrogate families.' The saloon and the boarding system together with other immigrant institutions - the church, the fraternal organization local, and the political club - were the primary devices utilized by the Slovenes and some other groups to deal with the sexual imbalance in the various groups.

The Slovenes entered the iron mining regions of Minnesota before the other South Slav groups and developed the largest population, around 7,000, at its peak, with the lowest male/female ratio of the South Slav groups. The Croats and Serbs began arriving about ten years after the Slovenes, but their populations also peaked around 1910 - the same time as the Slovenes. This clearly indicates the impact of the trends in the industry upon migration as there were less jobs there were many fewer in-migrants. The Croat population reached a maximum of 4500 people and the Serb population peaked at a total of 2600 at the same time. The male/female ratio for the Croats in 1910 was about 400 and that for the Serbs about 820. The problems of sexual imbalance was obviously greater for Serbs and Croats than they were for Slovenes. As the number of jobs in mining began to decline after 1910 the result was that the total population of Serbs and Croats began to drop rapidly as the single males began to look for work elsewhere. The Slovene population, on the other hand, declined comparatively little and stabilized by 1920. By 1930 the Croat population had dropped 50% to 2,200 people with a sex ratio of 190. By 1930 the Serb population had dropped by 60% to 1,200 people with a sex ratio of 240. Not surprisingly, the Croats and Serbs on the Range developed a less complicated set of formal organizations and institutions than did the Slovenes or larger groups like the English and Finns. This lack of social development seems to have been a function of the relatively small size of the groups rather than any lack of organizational skill. The lack of organization, then, was probably a function of size and the size of the group in turn was a function of timing of entry into the labor market and the subsequent patterns and duration of growth of opportunity in the labor market.

In the 1920s the Yugoslav groups on the Range began to systematically cooperate and integrate their formal activities. Slovenes and Croats had cooperated in religious affairs early on, with Croats attending Slovene churches rather than creating their own. In the 1920s, though, formal recognition of ties between the Yugoslav groups was established in the creation of several Yugoslav organizations that were dedicated to increasing cooperation in secular spheres, especially politics. This move toward 'Yugoslav' identity formation reflected the long term informal cooperation that had been practiced by the groups and also the creation of a united Yugoslav state in the aftermath of World War I. The depression and the shared hardships engendered by it reinforced this tendency to cooperate for the Yugoslavs as well as the other Range groups. The collective nature of the mobilization of resources during the Second World War also reinforced this process. At the same time, however, there developed a tendency for the Iron Range population to see itself as a distinct social group within the state - which in fact it was. Increased political activity and the rise of unionization as a result of the New Deal, continued dependence upon mining for the sustenance of the regional economy, the inability of the indsutry to absorb all the local potential workers, the resultant out migrations, the dependence upon educational attainment to make the out migrants competitive, and the distinctive southern and eastern European mix of a large part of the population compared with the generally Nordic cast of Minnesota as a whole, combined to make Iron Rangers see themsleves as something apart. What appears to have happened and what appears to be continuing to happen, is that the Iron Range people are developing into a new ethnic group based on the regional social experience rather than Old World tie and the experience of immigration.



If there is any merit to this hypothesis, or suggestion, at all, it must be also postulated that the political arena and the economic marketplace were the two key areas where Iron Range identity was forged. The reason that these two arenas were so vital is that in the beginning they were the sole domain of the native American settlers and the immigrants from northern and western Europe, especially the English, Irish, Germans, and Scandinavians. The mines were controlled by these people, most of the commercial activities were controlled by these people, and all of the political positions in the region were controlled by these people. In order for Iron Rangers to think of themselves as members of a larger social order than their particular immigrant groups and their native American (or 'Anglo') status, there had to occur a greater sharing of economic and political power at least at the local and regional levels. This sharing of power was more than simply symbolic but would reflect also the leveling of the population socioeconomically and reflect the upward mobility of the latest arriving groups.

What occurred was something of a revolution. Since the early 1940s, for almost forty years, the major political offices in the Range communities including mayoral seats, state senate and house seats, and city council seats in addition, have been held by Slovene, Finnish, and Italian immigrants' children. The congressional seat for northeast Minnesota has been held for 36 years by two successive Slovene immigrants' descendants. A governor has even been produced in the mid-1970s of Croatian extraction. The local mining officials include the descendants of Finnish, Yugoslav, and Scandinavian immigrants, immigrants who once labored in the mines for ten hours a day and six days a week. This political and economic revolution and the duration of it has

dramatically and irreparably changed the Iron Range social system. The impact of mining is still decisive in all things, the Range still retains it rough-and-tumble social flavor, and the people are still very conscious of their diverse origins, but it is truly a social system that reflects the potential strength that can arise from diversity. On this optimistic note, this historical analysis of the Iron Range is concluded.

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PART II

SUPPORTING DATA AND MATERIALS

This part is composed of a select bibliography, and detailed analyses of the censuses taken in 1885 and 1895.

SELECT BIBLIOGRAPHY

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APPENDIX B --
The Population of the Minnesota Iron Range in 1885

Settlers first moved onto the Minnesota Iron Range in large numbers during the early 1880s. The Soudan mine began shipping ore in 1884 with 62,000 gross tons shipped in that year and 225,000 the next. By May of 1885, when the state of Minnesota took its third decennial census, two settlements had been established: the mining village of Soudan, which housed the miners and was located near the shaft; and Tower, apparently a service center, two miles to the west at an old gold rush site on the shore of Lake Vermilion. According to the state census, 1426 people lived in these two new communities on May 1, 1885. This report describes their characteristics.[1]

I. The Data

The 1885 census is not especially rich in detail by comparison with the federal census of 1880 or 1890 (the manuscripts of the latter were long since destroyed by fire) or with the subsequent state census returns. It groups individuals into "families" (an ambiguous term discussed in more detail later) and reports their name, age, sex, country of birth, state of birth for those born in the United States, "color" (white, black, mulatto, Chinese, or Indian), whether the individuals parents were native or

foreign born, "condition" (whether the individual was deaf and dumb, blind, insane, or idiotic), and whether the individual had served as a soldier during the Civil War. No information was provided on occupations or employment, marital status (although this can often be inferred), education, school attendance, or literacy, wealth and income, relationships among the various persons in a household (although again, inference is possible), length of residence, and other matters often of interest to census takers and historians. Further, the enumerator for the range appears not to have been especially careful with the scanty information he was to have collected. He failed to record age in 81 cases, occasionally recorded a gender opposite that implied by the individual's name, usually entered United States rather than the specific state in which a person was born, and may have been careless in determining parental nativity.

Despite the scanty information and the apparently casual approach of the enumerator, we decided that the census of 1885 merited a major analytical effort. It is, after all, the first enumeration of range inhabitants, and it covers a period when few other sources are available. We need to know all we can about the first settlers, for their behavior set the stage for subsequent developments and a firm understanding of that population will provide a solid empirical base upon which generalizations can be built to be tested against more complete data drawn from later census returns. Accordingly we coded

the entire population, noting all the information provided by the census and extending that information where possible through a series of controlled inferences (the reliability of these inferences will be discussed at appropriate places in this report). A permanent record of these data has been stored on a tape housed with the Computer Center of the University of Minnesota. The original punched cards and a large batch of print output are currently in my possession; they will be released to the director of the Iron Range Historical and Cultural Survey when my work is finished. A copy of the code book is appended to this report.

II. Age, Sex, and Nativity

As was usually the case with "frontier populations," men outnumbered women at the Tower-Soudan settlements in 1885, in this case by about two and one-half to one (see Table 1). As Table 2 shows, the imbalance was especially severe among adults. The sex ratio among children hovered around unity (there were 174 boys under 15 and 169 girls, sex ratio = 103), jumped sharply for those in their late teens, rose even more steeply for persons in their early twenties, and continued to rise, reaching a peak of four men for each woman among those in their early thirties. Overall, the sex ratio for persons aged twenty and over was 355.2 (721 men, 203 women). Further, age was not reported for 76 of the males and five of the females. If, as seems likely from the position of such

persons in the households, all were adults, the sex ratio among those aged twenty and over was 383.2 (797 men, 208 women).

The age structure of the iron range settlements was also peculiar: there were relatively few very young or very old people in the population (see Table 3). Children under the age of fifteen made up only a quarter of the population, while the census reported only one person over the age of 65. The dependency ratio (persons under 15 and over 64 per person 15 to 64) was very low, perhaps one-half to one-third the norm for the United States as a whole in the late nineteenth century.

Figure 1 provides a graphic representation of these data. The contrasts with the familiar pyramid shape that such distributions assume in a "settled" population are striking. For persons under fifteen, the figure approximates the usual shape, but it then diverges sharply. Rather than two stairways of roughly the same size, steadily ascending to a peak, the structure reveals both a severe imbalance in favor of men and a fairly dramatic bulge at the midsection. Clearly, this shape reflects the job opportunities available in the area and the consequent composition of the migrant stream. Mining was "man's work," and the region was too isolated and too"new," as yet, that is, without a large service sector providing for the needs of miners and their families, to offer alternative employment, positions that might be filled by women. Most of those who came were young men, probably still

unmarried. At least few brought their families with them.

Tables 4 and 5 provide some context for these data on the age and sex structure of the iron range population. The degree of imbalance in the sex ratio and the concentration of the inhabitants in the working ages is striking, far outstripping that of agricultural or lumbering frontiers. Indeed, the distortion apparent on the iron range is surpassed only by that of California's gold country at the height of the rush. As the figures for Marquette county, Michigan, where iron mining began in the 1850s, suggest, a surplus of males among adults tended to persist in iron ore regions, although the proportion of children there in 1884 surpassed and the dependency ratio approached the national average. The peculiar characteristics of Marquette county's population were products of limited employment opportunities for women and high fertility which combined to produce unique iron range pattern, one that will be encountered again as this investigation pushes into the twentieth century.

Immigrants were a substantial majority among these first "rangers": 914 (64.1%) were foreign born, 512 (35.9%) were born in the United States. Table 6 reports country of birth for the 1426 inhabitants. The largest group among the foreign born came from Britain (England, Scotland, and Wales), the birth place of 334 of the inhabitants, nearly a fourth of the total population and a third of the foreign born. Canada was the birthplace of 122 settlers (8.6% of the total, 13.3% of the foreign born), Central Europe -- Germany, Austria,

and Poland -- of 81 (5.7%, 8.9%), Italy of 45 (3.2%, 4.9%), and Ireland of 44 (3.1%, 4.8%).

A majority of those born in the United States were the children of immigrants. Of the 512 native born residents, 337 (65.8%) reported that both parents were born outside of the United States, while another 33 (6.4%) reported one foreign born parent. Only 142 (27.7%) reported that both their mother and father were native born. Of these 16 were the grandchildren of immigrants, a minimum figure since such information is available from the census only for persons who were living with their parents when the enumeration was taken. Clearly, in 1885 the Minnesota iron range was an immigrant society (see table 7).

Table 7a reports the state of birth of those inhabitants of the iron range born in the United States. Two points stand out. First, the enumerator failed to record this information for over 70% of the native born, thus limiting substantially the usefulness of the census for the study of migration. Second, three-quarters of those whose state of birth was recorded were born in Michigan, Wisconsin, Pennsylvania, and New York, all states with large iron mining industries. The data is hardly conclusive, but it does suggest that many of these first immigrants to the Minnesota range were experienced miners.

Table 8 contrasts the age and sex distributions of native and foreign born persons. Natives dominated the bottom rungs of the pyramid, with the proportion foreign born in-

increasing steadily with age until they became a majority among those in their early twenties. The sex ratio among natives was much more evenly balanced than among the foreign born, but this was largely a function of differences in the age structure of the two groups. A majority of the natives (51%) were under age fifteen, a group in which the sex ratio approximated unity, while most of the foreign born (91%) were aged fifteen and over, the age categories in which the sex ratio showed the most severe imbalance (see Table 9). Among adults, the proportion of males in the population revealed only modest differences by nativity. If all those whose ages were not recorded were adults, the sex ratio among native born rangers over age fourteen was 308.2 (188 men, 61 women), while among the foreign born it was 368.5 (656 men, 178 women).

Tables 10 through 15 summarize the age and sex distributions among foreign born residents of the iron range by region of birth. All show a roughly similar pattern, with low ratios of children to adults and high ratios of males to females, especially evident among those aged fifteen and over. There are, however, some significant differences among the several groups, as Table 16 demonstrates. The adult sex ratios in particular show striking variations. Among adults born in Britain and Scandinavia, men outnumbered woemn by roughly 3.2 to 1, a ratio only slightly higher than that among those born in the United States. Adults of Canadian, Central European, and Italian birth, on the other hand, show a much more severe

imbalance, with between 5.5 and 6.5 men for each woman. Those born in Ireland fall between these two groups, although they are much closer to the lower range than to the upper. These variations in population suggest differences in the pattern of migration, a subject to be considered in more detail elsewhere.

III. Household and Families

The 1426 inhabitants of the Iron Range were grouped by the enumerator into "families" or households, defined by the following instruction:

> By a"family" is meant a number of persons, whether one or many, living together and subsisting at a common table, or from one common supply. A widow living alone and separately providing for herself, or two hundred individuals living together and provided for by a common head, should each be numbered as one family. The resident inmates of a hotel, jail, hospital, or other similar institution, should be recorded as one family, unless there be several tenements or distinct families, in which case they should be separated.[2]

The enumerator identified 180 "families," ranging in size from eighteen two=person households, usually a recently married young couple or two youthful bachelors, to a boarding house or hotel with 51 residents. Tables 17 and 18 describe the size distribution of households. While the average number of persons per household on the range was high (nearly eight people), the typical household was not large but contained only six persons. The mean was pulled up by a few large boarding establishments or hotels housing fifteen or more residents. Such dwellings served as "home" to more than a quarter of

of these early rangers.

Although the census is not explicit on such matters, it is possible to infer some useful information about the types of households and the relationships among people who lived in them. The enumerators were provided with fairly detailed instructions as to the sequence in which individuals in a household were to be recorded:

> The names are to be written beginning with the father or mother, or, if either or both are dead, begin with some other ostensible head of the family, to be followed, as far as practicable, with the name of the oldest child residing at home, then the next oldest, and so on, to the youngest; then the other inmates, lodgers and boarders, laborers, domestics, and servants.[3]

By assuming that this rule was followed with a fair degree of rigor (the phrase "as far as practicable" sounds a note of caution) and paying close attention to the ages and names, it should be possible to identify relationships with a high degree of accuracy and then to use those relationships to classify households by type. Accordingly, I developed a series of rules for determining relationships. I cannot, of course, be certain of the accuracy of these inferred relationships, especially for any one case, but for aggregate analysis they are probably sufficiently reliable so as not to produce misleading results. The 1900 federal census does describe the relationship of the members of the household to its head; when analysis of that document is completed it will be possible to speak with more assurance about the reliability of the following comments. In the meantime, I take encouragement from a similar analysis of a sample in the 1860 census conducted by Richard Easterlin and his associates.[4] Despite the fact that the data they worked

with did not contain names (a curious circumstance), they were able to reconstruct relationships within households with a high degree of accuracy simply by relying on age and sequence. Most of the errors they did make, furthermore, occurred in the identification of non-nuclear kin relationships, that is, in recognizing grandparents, stepchildren, nieces, nephews, and siblings of the head of household, connections which knowledge of names would often reveal. Given that I also had the name of each individual available to aid in making judgements, the results should be even more reliable.

Table 19 shows the distribution of individuals who appear on the census by their position in the household and relationship to its head. The table reveals two striking characteristics of the population, both already suggested by the discussion of age and sex characteristics. First, there were relatively few children who lived with a parent or parents. Only 352 persons, just under a quarter of the population, were children of the head of household, while an additional 50 children (3.5% of the total) lived with parents who were not listed as household heads. The second striking fact is the large number of boarders or lodgers, nearly half the total population. Of these 702 persons, 106 lived in nuclear kin groups within someone else's household (there were 33 such groups with 33 heads, 23 spouses, and 50 children). The remaining 596 persons (41.8% of the population), the vast majority of them young adult males, lived in households in which they apparently had no relatives. Table 20 shows that there were significant

differences in the way males and females were distributed within households. Women seldom headed households and they were rarely boarders or lodgers. Of the 80 females who can be classified as boarders, 47 lived with other relatives and only 33 (8.1% of all females) lived in households without kin members. Single, unattached females were a rarity, as one would expect in a region with so large a surplus of men and with so few job opportunities for women. Single, unattached males, on the other hand, were by far the most common grouping. 622 males were classified as boarders and of these only 59 lived with kin members. One further difference deserves mention. Males living with a parent or parents outnumbered females who did so by 217 to 185, perhaps the result of the composition of the migrant stream, the relative value to parents of the labor of sons and daughters, and differences in age at marriage between men and women.

Table 21 extends the analysis by showing the distribution of household positions by nativity. Clearly, the native born were much more likely to be children living with parents and much less likely to be boarders or lodgers than were those of foreign birth. As Tables 22 to 25 reveal, these differences are more a function of the age and sex structures of the two groups than of nativity. However, as Table 26 demonstrates, British born males were much less likely to be boarders and lodgers and much more likely to head households than those born in other regions, a fact which cannot be explained by differences in age and sex structure but rather seems to reflect their position as rather privileged immigrant group, in turn, perhaps, a function of their skills and prior experience as iron miners

in England as well as in the United States.

By close observation of names, age, and sequence, it was possible to infer the marital status of the inhabitants of the range. More strictly, I could determine whether a resident currently lived with a spouse, a proportion which must substantially understate the percentage married because many of the early settlers were men who may have left their families behind while they took a job on the range with the intention of later returning home or bringing their wives and children to join them in Minnesota. Of the 1426 residents of the range, 356 were living with a spouse, 19 were living with a child or children and were probably widowed, and 1051 were unmarried, or at least were not living with their spouse when the census was taken. Table 27 describes marital status by age and sex categories. There is no evidence in the census that anyone under the age of 15 was married, and only 4 of the 31 women (12.9%) and none of the men in their late teens were married. Sharp differences in the proportions married are evident among young adults. Only 16% of the men in their twenties were married or widowed, and only 33% of those in their thirties, while among women the comparable figures were 76% and 98%. The proportion of men who were or had been married continued to increase, reaching 62% of those aged 45 and over, but as there were no single women aged 35 or over -- the difference between males and females persisted. Somewhat surprisingly, as Tables 28 and 29 show, among adults the foreign born were somewhat more likely to be married -- or at least living with a spouse -- then were the native born, a general-

generalization that holds for both men and women.

There was a marked tendency for partners in marriage to have been born in the same country (see Table 30). In 16 of the 178 marriages (9.0%), both husband and wife were born in the United States, while in 123 (69.1%) both were born in the same foreign country. All told, only 39 (21.9%) were mixed by this standard, a figure that includes marriages between persons born in the same region of Europe, marriages between persons from English-speaking foreign countries and natives of the United States, and, perhaps, some marriages between a person born in a foreign country and a mate whose parents were also from that country. These first communities on Minnesota's iron range were as yet too new to have much dissolved the bonds of ethnicity, at least if marriage practices can serve as a proxy for their strength.

Table 31 describes differences in age between husbands and wives. In most cases, the husband was the older member of the marriage and the gap was small, less than ten years in 85% of the cases, although women were somewhat more likely to be older and the gap was more frequently large when both partners were immigrants than when both were native born. Table 32 reports a crude proxy for age at marriage calculated by subtracting the age of the oldest child living in the family from the ages of the parents. The measure is subject to distortion from several sources, particularly infant deaths and the migration of children, although the impact of the latter is minimized by using only families in which the wife was age 35

or less. Despite these weaknesses and the small number of observations for the native born, it ought to provide an accurate guide to relative ages at which groups of people had their first child. Fairly substantial differences appear. The native born, both male and female, were younger than immigrants when they had their first child, and, presumably, when they married. Since most of the marriages revealed by the census must have occurred before the couple migrated to Minnesota, conditions on the range can not explain the pattern. However, if, as there is some reason to believe, many of these first settlers were recruited out of older mining districts in the United States, places with a demographic and social environment that the Minnesota range would later approximate, we can expect the pattern to persist, with important consequences.[5]

Building upon the inferences concerning relationships, it is possible to group the 180 households on the range in 1885 into several categories (see Table 33). Sixty of the households were nuclear in structure, consisting of a husband and wife living alone in nine cases, and of a husband, wife, and their children in 51; 258 persons, 18.1% of the inhabitants, lived in such households. In 83 of the households this basic structure was complicated by the addition of boarders and or lodgers unrelated to the household head. In 14 of these 83, the nuclear unit consisted only of a husband and wife; in the remaining 69, husband, wife, and children were included. 818 persons, 57.4% of the population, lived in such households. Twenty-two of the households, with 218 inhabitants (15.3% of

the total) were boarding houses or hotels that were not headed by a nuclear kin group. Two of the remaining fifteen households were headed by a single parent (one obtained boarders, the other did not), while the rest were extended kin groups (11 with boarders, 2 without) in which the parents or siblings of the head joined the basic nuclear structure. Perhaps the most remarkable characteristic of this structure is that 1145 of the 1426 residents (80.3%) lived in households with persons to whom they were not related by kinship ties revealed in the information provided by the census.

In a recent study of household structures in late nineteenth century American cities, Modell and Hareven argued that boarding is best understood in terms of the life cycle. Their argument is worth quoting in full:

> ... in nineteenth-century cities the practice of boarding in families was closely articulated to the life cycles of both the boarders and of the families which took them in...Boarding in families in industrial America in the late nineteenth century was the province of young men of an age just to have left their parents' homes and was an arrangement entered into and provided by household heads who were of an age to have just lost a son from the residential family to an independent residence. It was plausibly a surrogate family -- in the psychological sense. But in terms of an economic calculus, it was almost precisely this. Or rather...it was a social equalization of the family which operated directly by the exchange of a young-adult income from his family of orientation to what might be called his family of re-orientation -- reorientation to the city, to a job, to a new neighborhood, to independence. It was a transfer from a family (often rural, whether domestic or foreign) with excess sons or daughters (or insufficient economic base) to one (usually urban) with excess room (or present or anticipated economic need). And often the excess room and the present or anticipated economic need can have come from the departure of a newly independent son.6

This life-cycle effect, if it can be said to have operated

at all, was clearly muted on the Minnesota iron range in 1885.Something like the pattern discovered by Modell and Hareven appeared among women on the iron range. The majority of women who boarded in the households of others were in their twenties, and the proportion who were boarders fell off sharply for those aged 35 and over, just as the proportion who headed households or shared headship with a husband jumped. Among men, however, the pattern was different. The majority of the boarders were young men and the proportion of who headed households increased with age, but substantial numbers of older men boarded. Only among the foreign born over forty did most males head households occupied only by kin (see Table 34). There is, however, some evidence of a life-cycle effect among the 33 families who lived within someone else's household. Seven of those families, 21%, consisted of childless couples, six, 18%, were couples in their twenties with one young child, and ten, 30%, were single parent families, seven of this category consisting of a father and son (or sons) of working age. Apparently, boarding offered advantages to both newly formed and recently broken families. On the whole, however, boarding on the iron range was less a function of the life cycle, more a response to the skewed age and sex structure, the new and rapidly growing nature of the population, and, perhaps, a shortage of housing that limited the options of the inhabitants.

Households on the range were often complicated by the presence of lodgers, but they were not marked by ethnic diversity. There was a marked tendency for persons who shared a household to share a national origin. 381 of the 652 adult boarders (58%)

on the range in 1885 lived in a household headed by a person who shared their country of birth, while only 59 lived in households with no other adult born in their native country. In 37 of the 117 households with boarders, (32%), all the adults were born in the same country. And these figures employ a strict definition of ethnicity. Were the standard relaxed to group together those from the same region or who spoke the same native tongue, these several indexes would describe even greater homogeneity.

IV. Conclusion

We are not done with the 1885 census. The data have not yet been placed in the context they deserve, they have not been used to illuminate migration patterns, and the information they contain on fertility remains to be explored. These subjects will be taken up in subsequent reports when evidence from later census returns is available for analysis. In the meantime, I hope enough material has been presented to justify the effort required to process and analyze this first count of the inhabitants of the Minnesota Iron Range.

Notes.

1. John W. Webb, An Urban Georgraphy of the Minnesota Iron Ranges (Ph.D. diss., University of Minnesota, 1958), 50. The census is available on microfilm at the Minnesota Historical Society, St.Paul.
2. Instructions to Enumerators, 1885 Minnesota Census.
3. Ibid.
4. Richard A. Easterlin, George Alter, and Grethcen A. Condran, "Farms and Farm Families in Old and New Areas: The Northern States in 1860," in Tamara K. Hareven and Maris A. Vinovskis, eds. Family and Population in Nineteenth-Century America (Princeton, 1978),22-84
5. I have discussed the pattern and discussed its causes and consequences for another time and place in Russell R. Menard, "Immigrants and Their Increase: The Process of Population Growth in Early Colonial Maryland," in A.C. Land, L.G. Carr, and E.C. Papenfuse, eds., Law, Society, and Politics in Early Maryland (Baltimore, 1977), 88-110.
6. John Modell and Tamara K. Hareven, "Urbanization and the Malleable Household: An examination of Boarding and Lodging in American Families," Journal of Marriage and the Family, 35 (1973), 467-479.

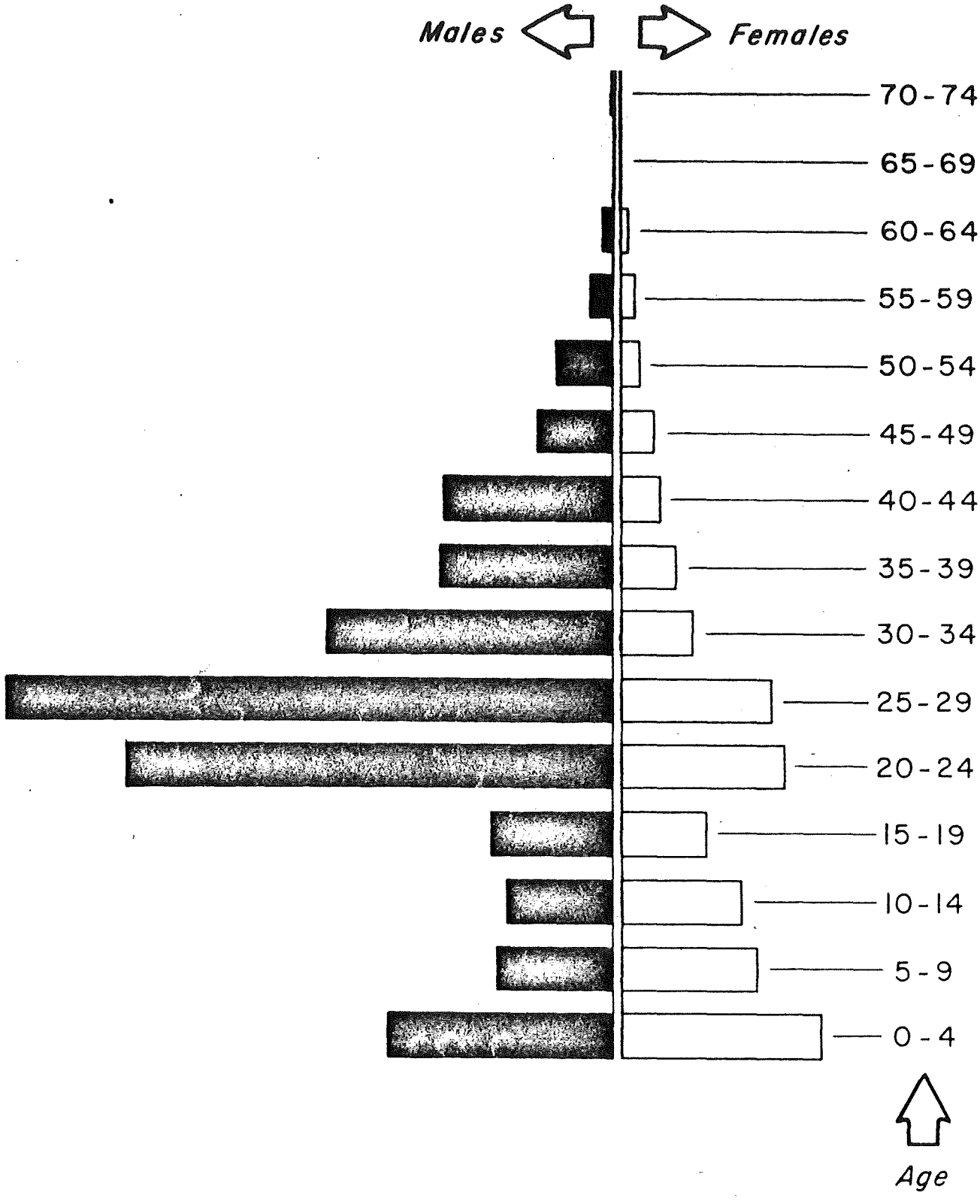

Figure 1. AGE & SEX STRUCTURE,
Minnesota Iron Range, 1885.

Table 1

Sex Ratio on the Minnesota Iron Range, 1885

Total Population	Males	Females	Males 100 Females
1,426	1,018	408	249.5

Table 2

Age and Sex Distribution, Minnesota Iron Range, 1885

Age Group	Males	Females	Sex Ratio
0- 4	86	75	114.7
5- 9	45	50	90.0
10-14	43	44	97.7
15-19	47	31	151.6
20-24	183	61	300.0
25-29	228	58	393.1
30-34	108	27	400.0
35-39	66	21	314.3
40-44	65	15	433.3
45-49	30	13	230.8
50-54	23	4	575.0
55-59	10	3	333.3
60-64	7	1	700.0
65-69	0	0	--
70-74	1	0	--
Total	942	403	233.7
Age Unknown	76	5	1520.0

Table 3

Age Structure, Minnesota Iron Range, 1885

Age Group	Males	Females	Total	Column Percent
0-14	174	169	343	25.5%
15-64	768	234	1,001	74.4%
65+	1	0	1	.1%

Dependency Ratio (Persons under 15 and over 64 per person 15-64)=.344

Table 4

Sex Ratios of the United States & Selected Regions, 1840-1890

Age	a. U.S. in 1890	b. Agricultural Frontier 1840-1860	c. Lumbering Frontier 1860	d. Gold Mining Co., 1850	e. Marquette Co. Michigan, 1884	f. Minn. Iron Range 1885
0- 9	103	106	102	108	100	105
10-19	101	111	102	1,206	105	120
20-29	103	150	238	5,779	162	345
30-39	113	165	205	3,991	156	362
40-49	108	141	364	7,725	158	339
50-59	108	116	240	4,650	155	471
60+	106	160	267	1,600	96	-
Total	105	125	168	3,329	127	250

a. - U.S. Census, 1890

- Jack E. Eblen "An Analysis of Nineteenth-Century Frontier Populations", Demography, II (1965), 404-S.

c. - George Blackburn and Sherman L. Ricards, Sr., "A Demographic History of the West: Menister County, Michigan, 1860", Journal of American History, 57 (1970), 604

d. - Sherman L. Ricards, "A Demographic History of the West" Butte County, California, 1850,"Papers of the Michigan Academy of Science, Pacts, and Letters, XLVI (1961), 481.

e. - Michigan State Census of 1884.

Table 5

Dependency Ratios in the United States and Selected Areas, 1850-1890

	Children	Aged	Ratio
U.S. in 1860 a	110.42	5.51	115.93
U. S. in 1890 b	92.18	7.74	99.92
Agricultural Frontier, 1860 a	119.26	5.76	125.02
Lumber Frontier, 1860 a	65.53	.35	65.88
Gold Mining Frontier, 1850 a	7.90	.18	8.08
Texas Cattle Frontier, 1850 a	76.98	4.58	81.56
Marquette Co., Michigan, 1884 c	92.27	2.12	94.39
Minnesota Iron Range, 1885	45.61	.11	45.71

Persons 0-19 and 65+ persons 20-64

a. - George Blackburn & Sherman L. Ricards, Sr., "A Demographic History of the West: Munister County, Michigan, 1860," Journal of American History, 57 (1970), 608.

b. - U.S. Census of 1840

c. - Michigan State Census of 1884

Table 6

Country of Birth, Minnesota Iron Range, 1885

Country of Birth	Numbered	% Total	% Foreign Born
United States	512	35.9%	
Austria	32	2.2%	3.5%
Canada	122	8.6%	13.3%
England	323	22.7%	35.3%
Finland	19	1.3%	2.1%
Germany	48	3.4%	5.2%
Ireland	44	3.1%	4.8%
Italy	45	3.2%	4.9%
Norway	48	3.4%	5.2%
Scotland	6	.4%	.7%
Sweden	212	14.9%	23.2%
Wales	5	.7%	.5%
Other[1]	10	.7%	1.1%

1 3 from France, the remainder from 7 other countries

Table 7

Parental Nativity of Native Born Residents of Minnesota Iron Range, 1885

Both Parents Native Born [a]	142
Father Native born, Mother Foreign Born	3
Mother Native Born, Father Foreign Born	30
Both Parents Foreign Born	337
Total	512

a At least 16 of these were the children of people with foreign born parents.

Table 7A

State of Birth, Native-Born Residents of the Minnesota Iron Range, 1885.

U.S., State Not Specified	364
Michigan	75
Minnesota	26
Wisconsin	26
Pennsylvania	7
New York	5
Iowa	2
Ohio	2
Other [a]	5
Total	512

a Five States with one each.1

Table 8

Age, Sex, and Nativity on the Minnesota Iron Range, 1885

	Native Born		Foreign Born	
Age	Males	Females	Males	Females
0- 4	79	65	7	10
5- 9	30	33	15	17
10-14	26	30	17	14
15-19	28	14	19	17
20-24	47	19	136	42
25-29	54	13	174	45
30-34	17	9	91	18
35-39	11	4	55	17
40-44	16	1	49	14
45-49	4	1	26	12
50-54	2	0	21	4
55-59	1	0	9	3
60-64	0	0	7	1
65-69	0	0		
70-74	1	0		
	316	189	626	214
Age Unknown	7	0	69	5

Table 9

Age by Sex, by Nativity Summary Table

	Natives				Foreign			
	Males	Females	Total	Sex Ratio	Males	Females	Total	Sex Ratio
0-14	135	128	263	105.5	39	41	80	95.1
15-64	180	61	241	295.1	587	173	760	339.3
65+	1	0	1	--	0	0	0	--
Age Unknown	7	0	7	--	69	5	74	1380.0
TOTAL	323	189	512	170.9	695	219	914	317.4

Table 10

Age and Sex Structure, Irish Born Population

Age	Males	Females	Total	Sex Ratio
0-14	0	1	1	--
15-64	33	9	42	366.7
64+	0	0	0	--
Age Unknown	1	0	1	--
Total	34	10	44	340.0

Table 11

Age and Sex Structure, Italian Born Population

Age	Males	Females	Total	Sex Ratio
0-14	2	1	3	500.0
15-64	32	6	38	533.3
64+	0	0	0	--
Age Unknown	4	0	0	
Total	38	7	45	542.9

Table 12

Age and Sex Structure, British Born Population

Age	Males	Females	Total	Sex Ratio
0-14	22	18	40	122.2
15-64	219	71	290	308.4
65+	0	0	0	--
Age Unknown	4	0	4	--
Total	245	89	334	275.3

Table 13

Age and Sex Structure, Scandanavian Born Population

Age	Males	Females	Total	Sex Ratio
0-14	10	14	24	71.4
15-64	167	57	224	293.0
65+	0	0	0	--
Age Unknown	29	3	32	966.7
Total	206	74	280	278.4

Table 14

Age and Sex Structure, Central European Born Population

Age	Males	Females	Total	Sex Ratio
0-14	2	4	6	50.0
15-64	39	9	48	433.3
65+	0	0	0	--
Age Unknown	26	1	27	2600.0
Total	67	14	81	478.6

Table 15

Age and Sex Structure, Canadian Born Population

Age	Males	Females	Total	Sex Ratio
0-14	3	3	6	100.0
15-64	92	18	110	511.1
65+	0	0	0	--
Age Unknown	6	0	6	--
Total	101	21	122	481.0

Table 16

Proportion of Children, Sex Ratio and and Adult Sex Ratio by Region of Birth

Region of Birth	% Under 15	Sex Ratio	Sex Ratio 15+
United States	51.4	170.9	308.2
Britain	12.0	275.3	314.1
Scandanavia	8.6	278.4	326.7
Central Europe	7.4	478.6	650.0
Canada	4.9	481.0	544.4
Italy	6.7	542.9	600.0
Ireland	2.3	340.0	377.8
Total	24.0	249.5	353.1

Note: Resources those whose age was not recorded were 15 years old or older.

Table 17

Household Size, Minnesota Iron Range, 1885

Size	No. Households	No. Persons
1 person	0	0
2	18	36
3	22	66
4	26	104
5	12	60
6	16	96
7	11	77
8	13	104
9	12	108
10	11	110
11	6	66
12	4	48
13	7	91
14	4	56
15	3	45
16	4	64
17	1	17
19	1	19
20	1	20
21	2	42
24	1	24
27	1	27
28	1	28
30	1	30
37	1	37
51	1	51
Total	180	1,426

7.92 persons per household
Median = 6 persons per household.

Table 18

Household Size, Minnesota Iron Range, 1885, Summary Table.

Size	# Households	% of Households	# Persons	% of Persons
0-5 persons	78	43.3	266	18.6
6-10	63	35.0	495	34.7
11-15	24	13.3	306	21.4
16-20	7	3.9	120	8.4
21-30	6	3.3	151	10.6
31 plus	2	1.1	88	6.2
Total	180	99.9	1426	99.9

Table 19

Household Positioning, Minnesota Iron Range, 1885

Position in Household	# Persons	% Total
Head[a]	180	12.6
Spouse of Head	152	10.7
Child of Head	352	24.7
Other relative of head[b]	27	1.9
Boarder, not related to head[c]	702	49.2
Unclassified, probable relatives of head	13	.9
Total	1426	100.0

a - includes 22 persons listed first in a household in which lived no one who could be identified as their relative.

b - includes two parents, 20 siblings, three spouses of siblings, and 2 nieces or nephews.

c - includes 33 persons who headed kin groups within households, 23 spouses of such persons, and 50 children of such persons.

Table 20

Sex by Household Position, Minnesota Iron Range, 1885

Position in Household	Male #	Male %	Female #	Female %
Head[a]	176	17.3	4	1.0
Spouse of head	0		152	37.2
Child of Head	190	18.7	167	39.7
Other relative of head[b]	19	1.9	8	2.0
Boarder[c]	622	61.1	80	19.6
Unclassified	11	1.1	2	0.5
Totals	1018	100.1	408	100.0

a - Males include 21 persons listed first in a household in which lived no one who could be identified as their relative, females include one such person.

b - Males include 2 brothers, 16 sisters, and 1 nephew; females include 4 sisters, 3 sisters-in-law, and 1 niece.

c - Males include 31 persons who headed kin groups within households, 1 husband of such a person, and 27 sons; females included 2 family heads, 22 wives, and 23 daughters.

Table 21

Household Position by Nativity, Minnesota Iron Range

Position in Household	Native Born # Persons	Native Born % Total	Foreign Born # Persons	Foreign Born % Total
Head[a]	30	5.8	150	16.4
Spouse of head	30	5.8	122	13.3
Child of Head	253	49.4	99	10.8
Other Relative of Head[b]	8	1.6	19	2.1
Boarder, not related to head[c]	181	35.4	521	57.0
Unclassified	10	2.0	3	.3
Totals	512	100.0	914	99.9

a - Native born includes 7 persons listed first in a household in which lived no one who could be identified as their relative, foreign born includes 15 such persons.

b - Native born includes 6 siblings, 1 spouse of a sibling, and 1 niece, foreign-born includes 2 parents, 14 siblings, 2 spouses of siblings, and 1 nephew.

c - Native born includes 6 persons who headed kin groups within households, 4 spouses of such persons, and 36 children of such persons, foreign born includes 27 persons who headed kin groups within households, 19 spouses of such persons, and 14 children of such persons.

Table 22

Household Position by Age, Native Born Males, Iron Range

Age	Head	Spouse of Head	Child of Head	Other Relative of Head	Boarders, Lodgers	Unclassified
0-14	0	0	112	0	18	5
15-19	0	0	16	0	12	0
20-24	4	0	7	1	34	1
25-29	13	0	1	1	36	0
30-34	4	0	0	0	13	0
35-39	0	0	0	0	11	0
40-44	4	0	0	2	10	0
45-49	2	0	0	0	2	0
50 plus	1	0	0	0	3	0
Total	24	0	136	4	139	6

Table 23

Household Position, By Age, Native Born Females, Iron Range

Age	Head	spouse of head	child of head	other relative of head	boarders, lodgers	unclassified
0-14	0	0	102	1	22	1
15-19	0	1	11	0	2	0
20-24	0	10	3	1	5	0
25-29	0	8	2	2	1	0
30-34	2	5	0	0	3	0
35-39	0	4	0	0	0	0
40-44	0	1	0	0	0	0
45-49	0	1	0	0	0	0
50 plus	2	30	118	4	33	1
Total	2	30	118	4	33	1

Table 24

Household Position by Age, Foreign Born Males, Iron Range

Age	Head	Spouse of Head	Child of Head	Other Relative Of Head	Boarder, Lodger	Unclassified
0-14	0	0	34	1	3	0
15-19	0	0	13	0	6	0
20-24	12	0	3	3	118	0
25-29	35	0	3	2	133	0
30-34	29	0	0	2	59	0
35-39	19	0	0	1	34	1
40-44	24	0	0	2	23	0
45-49	15	0	0	0	11	0
50 plus	14	0	0	2	20	0
Total	148	0	53	13	407	1

Table 25

Household Position by Age, Foreign Born Females, Iron Range

Age	Head	Spouse of Head	Child of Head	Other Relative Of Head	Boarder, Lodger	Unclassified
0-14	0	0	35	1	4	0
15-19	0	3	7	0	7	0
20-24	0	22	2	2	16	0
25-29	0	37	0	0	8	0
30-34	0	13	0	1	4	0
35-39	0	16	0	0	1	0
40-44	2	10	0	0	2	0
45-49	0	11	0	0	1	0
50 plus	0	6	0	0	2	0
Total	2	118	44	4	45	0

Table 26

Household Position by Region of Birth, Males, Iron Range

Region	Head	Child of Head	Other Relative of Head	Boarder, Lodger	Unclassified	Total
Ireland	7	0	1	25	1	34
Italy	7	2	2	27	0	38
Britain	79	33	9	123	1	245
Scandinavia	33	13	0	160	0	206
Central Europe	10	2	3	52	0	67
Canada	14	4	0	83	0	101
Other	1	0	0	3	0	4
U.S.	28	136	4	148	7	323

Table 27

Age by Sex by Marital Status, Iron Range

Age	Males			Females		
	Unwed	Currently M.	Previously Wed	Unwed	Currently Wed	Previously Wed
0-14	174	0	0	169	0	0
15-19	47	0	0	27	4	0
20-24	173	9	1	19	42	0
25-29	172	54	2	10	48	0
30-34	73	35	0	1	24	2
35-39	44	20	2	0	21	0
40-44	38	26	1	0	13	2
45-49	10	17	3	0	13	0
50 plus	17	19	5	0	8	0
Total	748	180	14	226	173	4

Table 28

Marital Status by Age and Nativity for Males

	Natives			Foreign Born		
Age Cat.	Unmarried	Currently Married	Previously Married	Unmarried	Currently Married	Previously Married
20-24	46	1	0	127	8	1
25-29	37	16	1	135	38	1
30-34	14	3	0	59	32	0
35-39	11	0	0	33	20	2
40-44	13	3	0	25	23	1
45-49	1	1	2	9	16	1
50 plus	3	1	0	14	18	5
	125	25	3	402	155	11

Table 29

Marital Status by Age and Nativity for Females

	Natives			Foreign Born		
Age Cat.	Unmarried	Currently Married	Previously Married	Unmarried	Currently Married	Previously Married
15-19	13	1	0	14	3	0
20-24	7	12	0	12	30	0
25-29	4	9	0	6	39	0
30-34	1	7	1	0	17	1
35 plus	0	6	0	0	49	2
Total	25	35	1	32	138	3

Table 30

Ethnicity of Marriage Partners

	N	%
Both Partners Native	16	9.0
Both Partners Born in Same Country Foreign	123	69.1
Partners Born in Different Country Foreign	11	6.2
Husband Native Born, Wife Foreign Born	8	4.5
Wife Native Born, Husband Foreign Born	20	11.2
Total Marriages	178	100.0

Table 31

Difference in Ages of Marriage Partners, Minnesota Iron Range, 1885

	Both Partners Foreign Born	Both Partners Native Born	Mixed	Total
Partners Same Age	12	2	2	16
Husband 1-4 years older	49	7	8	64
Husbands 5-9 years older	34	4	10	48
Husband 10 plus years older	15	1	5	21
Wife 1-4 Years Older	15	2	2	19
Wife 5-9 Years Older	4	0	0	4
Wife 10 plus years older	2	0	1	3
Totals	131	17	28	175

Table 32

Age of Parents at Birth of Oldest Child, Iron Range, 1885

	Native Males	Native Females	Foreign Males	Foreign Females
15-19	1	10	2	18
20-24	6	5	22	38
25-29	3	6	34	13
30 plus	0	0	20	0
Total	10	21	78	69
Mean	24.0	21.4	26.7	21.9
Standard Dev.	2.26	3.63	4.63	3.12
Median	24.0	19.5	26.0	22.0

Note: Calculated from the census by subtracting the age of the oldest child living in the family from the ages of the Parents in families in which the wife was aged 35 or under.

Table 33

Household Types, Iron Range, 1885

Type	# Households	# Persons	Persons per Household
Nuclear	60	258	4.3
Nuclear with Boarders	83	818	9.9
Boarders Only	22	218	9.9
Single-parent, kin only	1	9	9.0
Single-parent, boarders	1	7	7.0
Extended, kin only	2	9	4.5
Extended, with boarders	11	107	9.7
Total	180	1426	7.9

Table 34

Characteristics of Nuclear Households, Minnesota Iron Range, 1885

	Without Boarders	With Boarders
Mean Age of Husband	35.9	36.0
Mean Age of Wife	31.7	32.3
Mean Number of Children	2.3	2.3
Mean Age Oldest Child	8.4	10.2
Mean Age Youngest Child	3.0	4.8
Number of Households	60	83

APPENDIX C --
The Population of the Minnesota Iron Range in 1895

The population of the Minnesota Iron Range grew rapidly in the late 1880s and the early 1890s. The Vermilion Range grew from 1426 inhabitants in 1885 to 4497 in 1890 and to 5635 by 1895. Although there was a clear slackening in growth after 1890, the annual rate for the decade as a whole was an impressive 14.7%. Growth on the Mesabi was even more spectacular. The published report on the federal census of 1890 recorded no inhabitants in the region in its breakdown of the population of St. Louis County by minor civil division, although it is known that there were some work crews operating there at the time. In 1895, enumerators for the state counted 9519 residents on the Mesabi Range (see Table 1). Iron ore production also expanded rapidly. The 62,000 gross tons shipped from the Vermilion mines in 1884 had increased to more than a million by 1895, while shipments from the Mesabi grew from an initial 4000 gross tons in 1892 to 2.8 million in 1895 (see Table 2). The Minnesota iron boom was on. In 1895, inhabitants of the Range numbered 15,154, the vast majority of them dependent in one way or another on the mining industry. This report describes their characteristics.

Unfortunately, the federal census of 1890 is of little use to students of Minnesota's Iron Range. The original returns of the enumerators, which were especially rich in detail, were long since destroyed by fire, while the published version presents most of its data for counties and states, a level of aggregation that obscures as much as it illuminates. Total population figures for four minor civil divisions on the Vermilion Range have been preserved (see Table 3),

Table 1. The Population of the Minnesota Iron Ranges, 1885 - 1895.

Date	Vermilion Range	Mesabi Range	Total
1885	1426	-------	1426
1890	4497	-------	4497
1895	5635	9519	15154

Annual Growth Rates.

Period	Vermilion Range	Total
1885-90	25.8%	25.8%
1890-95	4.6%	27.5%
1885-95	14.7%	26.7%

Table 2. Iron Ore Shipments, Minnesota Iron Range, 1884-1895, In Thousands of Gross Tons.

Date	Vermilion Range	Mesabi Range	Total
1884	62		62
1885	225		225
1886	304		304
1887	394		394
1888	512		512
1889	845		845
1890	880		880
1891	895		895
1892	1168	4	1172
1893	821	614	1434
1894	949	1793	2742
1895	1078	2782	3859

Source: Lake Superior Iron Ore Association, Lake Superior Iron Ores: Mining Directory and Statistical Record...(Cleveland: 1952).

but other information is presented only for St. Louis County as a whole and is of little use for our purposes.

Aggregate Data, 1895. The fourth decennial census of Minnesota, taken on June 1, 1895, is an extremely valuable document for the study of the Iron Range. The published report contains, for minor civil divisions within the state, total population, the number of legal voters, the number of males and females, and some information on the nativity and occupation of the inhabitants.[1] Tables 4 through 6 abstract most of the available information for the Iron Range, broken down by minor civil division and with subtotals for the Vermilion and Mesabi Ranges. These tables provide much useful data and some valuable insight into the demographic process on the Iron Range, especially when attention is directed towards contrasts.

Table 4, which presents the population of the subdivisions on the Range, need not detain us, although it is worth noting that Virginia, with more than 3600 inhabitants, had already emerged as a sizeable town although it had been established only a few years earlier. Table 5, however, presents some useful information on sex ratios in the several Range communities and may provide some insight into the age of the inhabitants. On the Range as a whole, the sex ratio (males per 100 females) was 233.0, down slightly from the 249.5 reported for the region on the 1885 census, but still highly imbalanced even by the standards of frontier populations.[2] There is, further, a substantial difference between the two ranges: the sex ratio on the older Vermilion Range was 162.7, while in the Mesabi it was 296.7. The table also reports the number of legal voters in each subdivision, which, it seems reasonable to assume, is a category identical with the number of men aged 21 and over. If this assumption is correct, some conclusions concerning the

Table 3. The Population of the Minnesota Iron Range in 1890.

Civil Division	Number of Inhabitants
Breitung Township	1784
Ely Village	901
Morse Township	702
Tower City	1110
TOTAL	4497

NOTE: 942 persons lived in portions of St. Louis County not returned by townships; doubtless some of these lived on the Range.

Table 4. Population of the Minnesota Iron Range in 1895.

Subdivision	Population
Breitung	1954
Ely	2260
Tower City	1265
Morse	156
Total, Vermilion Range	5635
Biwabik	365
Biwabik Village	1011
Clinton	105
Eveleth	764
Hibbing	1085
Iron Junction	131
Mesaba	22
Mesaba Village	159
McDavitt	106
McKinley Village	136
Missabe Mountain	708
Merritt Village	60
Nichols	337
Mountain Iron Village	443
Stuntz	68
Virginia City	3647
Unorganized	372
Total, Mesabi Range	9519
Total	15154

age structure of the population are possible. First, among males, fully 71.6% were adults, down slightly from roughly 80% in 1885. If we make the further assumption that the sex ratio of those under 21 was 100 (in 1885 it was 110), then only about 40% of the population total was under 21. Clearly, this was a population dominated by adult males, with relatively few women or children; characteristics very much apparent on the Range in 1885. By these assumptions, there are also substantial differences in the age structure of the two ranges; clearly, the Vermilion had a higher proportion of children, the Mesabi was more thoroughly dominated by adults. The difference between the two populations in the sex ratio among adults, again if our assumptions stand, is also striking: on the Vermilion it was less than 300, on the Mesabi nearly 500.

Table 6 summarizes the published data on nativity for the Iron Range from the 1895 census. Of the 14626 inhabitants, 8695 (59.4%) were foreign born, 5931 (40.6%) natives, a modest increase in the proportion native since 1885 when the percentages were 64.1 and 35.9, respectively. The increase may reflect the growth in the proportion of children since 1885 suggested by the data in Table 5. Again, there is a clear difference between the two ranges: on the Mesabi, 39% of the population was native, while on the Vermilion 43.2% were born in the United States. Evidence on country of birth for those born outside of the United States is also summarized in Table 6. Clearly, the categories used by the compilers were inadequate for the Range: more than half the foreign born were lumped in a residual classification, apparently made up largely of Finns and Austrians (i.e., Slovenes). Despite these weaknesses, the data do reveal an increasingly diverse population since 1885, a change most evident in the decline in the

Table 5. Legal Voters and Sex Ratios, Minnesota Iron Range, 1895.

Subdivision	Population	Legal Voters	Males	Females	Sex Ratio
Breitung	1954	719	1252	702	172.3
Ely	2260	946	1404	856	164.0
Tower City	1265	342	737	528	139.6
Total, Vermilion	5479	2007	3393	2086	162.7
Biwabik	365	189	290	75	386.7
Biwabik Village	1011	470	683	328	208.2
Clinton	105	64	85	20	435.0
Eveleth	764	629	655	109	600.9
Hibbing	1085	624	896	189	474.0
Iron Junction	131	49	89	42	211.9
Mesaba	22	12	22	0	-----
Mesaba Village	159	49	107	52	205.8
McDavitt	106	73	94	12	783.3
McKinley Village	136	66	87	49	177.6
Missabe Mt.	708	461	553	155	356.8
Merritt Village	60	26	40	20	200.0
Nichols	337	215	242	95	254.7
Mt. Iron Village	443	188	267	176	151.7
Stuntz	68	62	67	1	6700.0
Virginia	3647	2152	2664	983	271.0
Total Mesabi	9147	5329	6841	2306	296.7
Total, Both	14626	7336	10234	4392	233.0
Other	528				
Total	15154				

NOTE: The entire population is described as 'white,' with the exception of 2 Chinese in Biwabik Village, 1 Ely, and 5 in Virginia; 10 'colored' in Virginia; and 2 'Indian half-breeds' in Tower.

Table 6. Nativity, Minnesota Iron Range, 1895.

Subdivision	Total Population	Native Born	Foreign Born	Great Brit.	Ireland	Scandinavians	Canada	Germany	Russia	Other
Breitung	1954	751	1203	133	4	336	23	14	0	693
Ely	2260	868	1392	132	7	125	68	46	8	976
Tower City	1265	746	519	44	14	212	83	31	24	113
Total, Vermilion	5479	2365	3114	309	25	673	174	91	32	1782
Biwabik	365	133	232	16	4	56	13	9	0	134
Biwabik Village	1011	418	593	25	13	93	52	21	6	383
Clinton	105	47	58	0	2	22	15	4	0	15
Eveleth	764	218	546	20	12	130	57	7	0	320
Hibbing	1085	354	731	9	10	284	111	14	2	301
Iron Junction	131	73	58	4	6	8	38	0	0	2
Mesaba	22	1	21	0	0	15	1	0	0	5
Mesaba Village	159	78	81	1	3	4	26	4	0	43
McDavitt	106	32	74	1	6	50	6	2	0	9
McKinley Vill.	136	64	72	6	1	27	19	7	0	12
Missabe Mt.	708	255	453	69	9	65	25	6	0	279
Merritt Vill.	60	25	35	0	1	9	12	0	0	13
Nichols	337	186	151	9	6	32	29	3	0	72
Mt. Iron	443	230	213	15	6	36	58	2	0	96
Stuntz	68	26	42	2	2	14	16	1	0	7
Virginia	3647	1426	2221	200	81	541	251	58	80	1010
Total, Mesabi	9147	3566	5581	457	162	1386	679	131	88	2701
Total, Both Ranges	14626	5931	8695	766	187	2059	903	229	120	4483
Other	528									
Total	15154									

Notes: Great Britain = England (631), Wales (6), Scotland (49).
Scandinavia = Denmark (21), Norway (373), Sweden (1663).
There were 1594 Russians in St. Louis County, 202 of them Poles.
Other includes 18 from France. There were 6121 'Others' in St. Louis County, including 3225 Finns and 1324 Austrians.

proportion from Britain and the rise in the numbers of Scandinavians, Finns, and Central d East Europeans.

The published summary of the 1895 census is of limited use, but it does provide some support for an interesting hypothesis. It was argued earlier that over time Iron Range communities changed from a predominantly male, foreign born, adult population to a largely native born population with more nearly equal proportions of men, women, and children, and that this shift was closely related to the timing of settlement and the pattern of growth.[3] In 1895, the range as a whole was clearly at the beginning of this process, but the contrasts between the older Vermilion district and the more recently settled Mesabi evident in the published data support the argument. Only a decade separated their opening, but the Vermilion settlements had clearly begun the transition and contained significantly larger proportions of women, children, and the native born than did those on the Mesabi. Subsequent sections of this report will elaborate the contrast between the two Ranges.

The manuscript of the 1895 census contains a wealth of information that the compilers of the published version failed to exploit. It groups individuals into families (an ambiguous term discuss d below) and reports their names, ages, sex, 'color' (white, black, mulatto, Chinese, Indian), residence, country of birth, state of birth for those born in the United States, whether the individuals mother and father were native or foreign born, length of residence in Minnesota and in the district (for adult males only), regular occupation and months employed over the past year (for adult males only), and whether the individual had served in the military (again, for men only). In addition, information on marital status and the relationships among various persons in a household can often be inferred by paying

strict attention to name, age, and sequence.

In order to exploit this detail, a sample of 1781 individuals, just under 12% of the total, was drawn from the manuscript schedules. The sampling procedure was simple. Budgetary constraints dictated a sample population of 1500 to 2000 individuals, somewhat on the thin side but probably adequate to my purpose. (A substantially larger sample has been drawn from the much richer 1900 federal census.) I then estimated the average number of entries per page and the number of pages encompassed by iron range districts, calculated the number of pages needed to achieve the target sample size, and, after a random start, coded all households on every nth page. Only households that began on a selected page were coded, but all individuals living in households that ran from a selected page to the next entered the sample. We coded the individuals thus selected, noting all the information provided by the census and extending that information where possible through a series of controlled inferences (the reliability of those inferences will be discussed at appropriate places in this report). A permanent record of these data has been stored on a magnetic tape housed with the Computer Center of the University of Minnesota. The original punched cards and a large batch of printed output are also available.

In 1895, the Minnesota Iron Range revealed the demographic characteristics of a 'frontier' population: the region was dominated by young adult males and there were few women, children, or eldersettlers in the region. Table 10 describes the age and sex distribution in the sample population; Table 11 provides a more concise summary of the data. The contrasts with the familiar pyramid shape that such distributions assume in a 'settled' population; Table 11 provides a more concise summary of the

Table 10. Age and Sex Distribution, Minnesota Iron Range, 1895, Sample Population.

Age	Males	Females	Sex Ratio
0-4	114	107	106.5
5-9	62	67	92.5
10-14	29	37	78.4
15-19	29	38	76.3
20-24	162	57	284.2
25-29	294	74	397.3
30-34	247	64	385.9
35-39	154	25	616.0
40-44	74	9	822.2
45-49	37	8	462.5
50-54	38	5	760.0
55-59	14	3	466.7
60-64	5	3	166.7
65-69	2	1	200.0
70+	3	0	-
Unknown	13	5	260.0
Total	1277	503	253.9

Table 11. Summary of Age and Sex Distribution, Minnesota Iron Range, 1895, Sample Population.

Age	Males	Females	Sex Ratio	Total
0-14	205	211	97.2	416
15-64	1054	286	368.5	1340
65+	5	1	500.0	6
				1762

Dependency Ratio (Persons under 15 and over 65 per person 15-64) = .315.

Table 12. Age and Sex Distribution, Vermilion and Mesabi Ranges, 1895, Sample Population.

	Mesabi Range			Vermilion Range		
Age	Males	Females	Sex Ratio	Males	Females	Sex Ratio
0-4	51	46	110.9	63	61	103.4
5-9	28	25	112.0	34	42	81.0
10-14	8	20	40.00	21	17	123.5
15-19	15	21	71.4	14	17	82.4
20-24	117	29	403.4	45	28	160.7
25-29	237	45	526.7	57	29	196.6
30-34	192	28	685.7	56	36	155.6
35-39	115	12	958.3	39	13	300.0
40-44	52	5	1040.0	22	4	550.0
45-49	29	3	966.7	8	5	160.0
50-54	27	2	1350.0	11	3	366.7
55-59	7	1	700.0	7	2	350.00
60-64	1	1	100.0	4	2	200.0
65-69	1	0	-	1	0	-
70+	2	0	-	2	0	-
Total	882	238	370.6	384	259	148.3

Table 13. Summary of Age and Sex Distribution, Vermilion and Mesabi Iron Ranges, 1895, Sample Population.

A. Mesabi Range

Age	Males	Females	Sex Ratio	Total	% Total
0-14	87	91	95.6	178	15.9
15-64	792	147	538.8	939	83.8
65+	3	0	-	3	.3
Total	882	238	370.6	1120	100.0

Dependency Ratio = .193

B. Vermilion Range

Age	Males	Females	Sex Ratio	Total	% Total
0-14	118	120	98.3	238	37.0
15-64	263	139	189.2	402	62.5
65+	3	0	-	3	.5
Total	384	259	148.3	643	100.0

Dependency Ratio = .600

data. The contrasts with the familiar pyramid shape that such distributions assume in a 'settled' population are striking. For persons under twenty, the figure approximates the usual shape, although the surplus of females in the teens is surprising and perhaps a result of the small sample size. Once it reaches age twenty, however, the pattern diverges sharply from the usual shape. Rather than two stairways of roughly the same size, steadily ascending to a peak, the structure reveals a severe imbalance in favor of men, a dramatic bulge at the midsection, and a sharp tapering in the older age classes. Two summary statistics reveal the extent of the divergence from a balanced distribution. The sex ratio among persons age 20 and over was 413.6, high even by the standards of mining frontiers and roughly 25% higher than that reported for the Range in 1885. The dependency ratio - the number of persons under 15 and over 64 per person, aged 15 to 64 - was .315, roughly a third that of the United States as a whole in 1890, strong testimony to the predominance of young adults in the population.

The differences between the two ranges in the year 1895, described in Tables 12 and 13, are striking and provide some insight into the process of change in these early iron mining communities. The Vermilion Range, where iron mines had first been opened in the early 1880s, had changed substantially in the ten years since the last state census. Although the process was far from complete, the adult sex ratio had fallen sharply, by nearly half, and the proportion of children had increased by as much. The Mesabi, on the other hand, first opened only a few years before, still remained very much a mining camp, with severe imbalances in its population. If we think of the data for the two ranges as describing a time series rather

a cross section we can gain understanding of demographic patterns on the range. Mining was 'man's work,' and the region was too isolated and, initially, too 'new,' at first without a large service sector providing for the needs of the miners and their families to offer alternative employment, positions that might be filled by women. Job opportunities shaped the migrant stream and the composition of the population. Most who came to the new mining settlements were young men, probably still unmarried. At least a few brought their families with them. The consequence of such a migration pattern were populations dominated by young adult males like that of the Vermilion in 1885 and the Mesabi ten years later. Over time, however, miners found wives and had children or sent for families left behind when they had first moved to a new site seeking work, while other sectors of the local economy grew and provided women with jobs, or some jobs. With these changes, the proportion of women and children grew and the population began to assume a more settled shape, a process well underway on the Vermilion Range by 1895.

* *

PART III

HISTORIC RESOURCE INVENTORY OF THE IRON RANGE

This part of the report of the survey is composed of the listing of National Register of Historic Places nominations suggested by the survey and also the complete listing of Iron Range historic resources identified by the survey.

LIST OF IRON RANGE RESOURCES
PROPOSED FOR NOMINATION TO THE
NATIONAL REGISTER OF HISTORIC PLACES
BY THE
HISTORIC-CULTURAL SURVEY OF THE IRON RANGE

This list of proposed National Register nominations is intended to reflect, as a collection, the historical development of the Minnesota Iron Range as outlined in Part I of the report. The proposed nominations will be presented to the Minnesota State Review Board for consideration in public meetings to be held at Eveleth and Chisholm, Minnesota, on Tuesday, 25 September and Wednesday, 26 September, 1979. The nominated resources are presented here with their historic name, name of community in which they are located or in the vicinity of which they are located, and the relevant section in the historical analysis (Part I of this report) which provides the context of the resource's significance. Specific statements of significance are to be found with the documentation that accompanies the National Register Nominations. This documentation forms a part of this report, but is physically distinct from it.

A. Proposed National Register Nominations of National Significance

Resource	Community	Section of Analysis
Soudan Mining District	Soudan	I, II, III, IV
Mesaba Park	near Cherry	IV
Hill Annex Mine	Calumet	I, II
Sintering Plant	Ironton	I, II

Resource	Community	Section of Analysis
Yugoslav Catholic Union	Ely	I,II,IV
All Steel Home	Hibbing	I, II
Croft Mine	Crosby	I, II

B. Regionally Significant Sites

1. Ethnic Structures and Organized Labor Structures

Slovenian Home	Chisholm	I, IV
Sons of Italy Hall	Hibbing	I, IV
Polish Church	Virginia	I, IV
B'nai Abraham Synagogue	Virginia	I, IV
Church of the Good Shepherd	Coleraine	I, II, IV
Congregational Church	Biwabik	I, IV
Grace Lutheran Church	Hibbing	IV
Socialist Opera Hall	Virginia	IV
Workers' Hall	Crosby	III, IV, II

2. Corporate Paternalism Structures

Carnegie Library	Coleraine	I, II, IV
Workers' Housing District	Crosby	I, II, III, IV

3. Workplace Structures

Leetonia Location	Hibbing	III, I, II, IV
Sibley Dry House	Ely	I, III, IV

Resource	Community	Section of Analysis
4. Social Institutions		
State Theater	Virginia	III, IV
Delvic Building	Hibbing	I, IV
Androy Hotel	Hibbing	I, IV
Rex Hotel	Hibbing	I, IV
Jukkola Boarding House	Virginia	I, IV
Finnish Sauna	Virginia	III, IV
Pyrinto Boarding House	Chisholm	III, IV
Nanni's Bar	Eveleth	III, IV
5. Buildings Related to Rise of Corporation		
City Hall	Hibbing	I, II, IV
Great Northern Iron Ore Building	Hibbing	I, II, IV
6. Nonmining Economic Activities		
Virginia-Rainey Lake Lumber Company Offices	Virginia	IV, III
Iron Range Brewery	Tower	III, IV
Shirt Factory	Virginia	III, IV
Lumber Mill Manager's Home	Virginia	III, IV
DuPont Plant & Office	Hibbing	III, IV, I
Burntside Lodge	Ely	II, I, IV
7. Transportation Resources		
Interurban Railway District	Hibbing, Virginia, Eveleth	IV
Virginia Railroad Depot	Virginia	I, IV
Anderson House (Bus)	Hibbing	I, IV

Resource	Community	Section of Analysis
8. Public Health Structures		
Tanner Hospital	Ely	III, IV
Eveleth Recreation Building	Eveleth	III, IV
9. Locally Significant Sites		
Jack Fena House	Hibbing	I, IV
Galob/Sikich Home	Hibbing	I, IV
John Chisholm Home	Hibbing	I, IV
High School	Hibbing	I, IV
Lenont Home	Virginia	I, IV
Coats Home	Virginia	I, IV
Brewery	Virginia	I, IV
Bailey House	Virginia	I, IV
Bernard Home	Eveleth	I, IV
Eveleth Manual Training Center	Eveleth	I, IV
Urania Hall	Eveleth	I, IV
Redstone House	Eveleth	IV
Resurrection/Holy Family Church	Eveleth	III, IV
Fire Hall	Tower	III, IV
Kearney's Saloon	Winton	III, IV
City Jail	Winton	III, IV
Merritt Bank	Biwabik	I, IV
Northern Hotel	Aurora	I, IV
Ukrainian Church	Chisholm	I, III, IV
Railway Depot	Crosby	I, IV
Milford Mine	Crosby	I, IV
Otto Johnson Home	Parkville	I, IV

* * * End of List * * *

LIST OF HISTORIC RESOURCES
IDENTIFIED BY HISTORICAL-CULTURAL SURVEY
OF THE MINNESOTA IRON RANGE (1978-1979)

This list is the complete inventory of historic resources identified on the Minnesota Iron Range conducted between October 1978 and September 1979. The resources are listed by community.

AURORA

Aurora City Hall and Fire Hall
Aurora Hospital
*Aurora Workers' Society Hall
*Chester Camps
*Colvin and Robb Lumber Company
#*Embarrass River Bridge
*Erie Mine Viewpoint
*Erie Preliminary Plant Site
#*Geggie Test Pits
*Hearding Building
Johnson School
#*Mallman Test Pits
*Mesaba Ridge Trail
#*Miller Mohawk Mine
Old Cooperative Store
Kelly House
*Palo Fire Site
*Powder Iron Plant
#*Stephens Location

BABBITT

#*Sulphur Camp Site

#*Mitchell Mine

#*Birch Lake Plantation

#*Old Babbitt

BIWABIK

*Ajax Mine Site

Karki Home

#*Bangor Mine

#*Belgrade Location

*Biwabik Hospital

*Biwabik Park and Community Building

#*Biwabik Printing Office

*Biwabik Spring

*Captain Lutes House

Drake and Stratton Boarding House

*D & IR RR Bridge Ruin

*Esquagama Club

*Longyear Camp #2

#*Merritt Ghost Town

#*Shanks Lumber Camp

BUHL

*Buhl Fire Hall

*Buhl Public Library

*Buhl Village Hall

Cronberg Building

#*Lucknow Ghost Town

*Sharon Hospital

*Shaw Hospital

CHISHOLM

Chisholm City Hall

Chisholm Community Building

*Chisholm Carnegie Library

CCC Camp, Sturgeon Lake

Community Methodist Church

*Fraser Ghost Town

*Glen-Pillsbury Mine

Graham Apartments

*Great Northern RR Trestle

Landfill Bridge

#*Longyear Camp #4 - Site

*Museum of Mining

NYA Project Buildings

The OCTAGON

*Russian Orthodox Church

*St. Vasilije Ostrog Serbian Church

Sartor's Store

Webber Hospital

CRISBY

Hallett Building

Spalding Hotel

Creamery

Martinetto Building

Old Shannon House

Lutheran Church

Old Armory

ELY

*Asa Camp Home

Berglund Hardware Store

Chamber of Commerce

*Chandler Location

Crossman Cafe

Elofson Home

Ely Bottling Works

Ely Methodist Church

Emeraldite Company

Fensky Home

Finnish Opera House

*Finnish Stock Company

Fortier Home

#*Hegmann Lake Pictographs

*Holms Residence

K-R Hall

Kelava Bay

Kapsch Saloon

Lampi Residence

#*La Rue Mine

Lincoln School

#*Lucky Boy Mine

*McComber Mine

NYA Project Buildings, Park

Old City Garage

Old Pete Residence

*Pillow Rock

*B.S. Richards Home

*Section 30

*Shagawa Hotel

*Shipman Apothecary

State Bank

Tertiary Waste Treatment Plant

Vail Home

Vail's Hardware

*Voyageur's Center

EVELETH

#*Adams Mine Camp

Brascugli Building

Detention Hospital

*Eklund Homestead

Elks Club

Essling Apartments

Eveleth Area Historical Center

*Eveleth Auditorium

*Eveleth City Hall

*Eveleth Public Library

Fee Owners Building

First National Bank

Golden Rule Store

*Hockey Hall of Fame

*Iron Junction

Lincoln School

Leonidas Location

*Leonidas Mine

Miners' National Bank

Masonic Hall

Monitor Hall

Runeburg Hall

*Time Vault

#*Vega Mine

GRAND RAPIDS

Arf Home

Aiken Home

Betts Home

*Blandin Paper Mill

Bossard Home

*Drumbeater Island

Finnigan Home

*Gumm Home

Gunderson Home

Huntly Home

*Indian Village Site

Kurtz Home

*Lind Greenway Mine

*Logging Grade

C.C.McCarthy Home

Meyers Home

O'Brien Home

Patrick Home

R. Patterson Home

*Pokegama Portage

Rossman Home

Russell Home

Sheldon Home

Sisler Home

*Sugar Bush Camp

Taylor Home

Whittemore Home

HOYT LAKES

#*Allen Junction

*CCC Camps

*Erie Taconite Plant

*Fisherman's Point

#*Hinsdale Granite Quarry

#*Mesaba Ghost Town

#*Mesaba Station

#*Skibo Mill

*Sugar Bush Camp

#*Williston and Charnley Mill

IRONTON

City Hall

Spina Hotel

Presbyterian Church

MEDIMAEN

*Bray Mine

First State Bank

*Keewatin City Hall

*Mesabi Chief Mine

*National Taconite Plant

Old State Bank

*Pickerel Brook

MOUNTAIN IRON

*Mountain Iron High School

*Mountain Iron Carnegie Library

Mountain Iron City Hall

City Power Plant

Episcopal Church

Lutheran Church

West Virginia School

NASHWAUK

*Butler Taconite Plant

*Cooley Ghost Town

*Hawkins Location

City Hall

*Ollila Hotel

SOUDAN

*Breitung Mine

#*Jasper Peak

#*Mud Creek Gold Camp

#*Mud Creek Iron Mine

*North American Gold and Iron Mine

TOWER

#*American Fur Company Post

#*Lee Hill Mine

*Minnesota Iron Company Sawmill

*Pike Bay Lumber Company

Tower Bank

City Hall

*Lumber Mill

#*Wheeler's Post

Virginia

#*Bailey Lumber Mill Site

Benson Home

Detention Hsopital

Crow Residence

Enterprise Building

Fire Hall

*Franklin Village

*Carnegie Library

Masonic Hall

#*Moon and Kerr Sawmill Site

Roman Hall

*Pakala Building

Roosevelt School

Silver Lake Hotel

School Farm

South Side School

State Bank Building

*Svea Hotel

*City Hall

*Water and Power Building

*Zion Lutheran Church

WINTON

Clothing Store

*Community Church

Pool Parlor

St. Croix Club House

St. Croix Store

Swallow-Hopkins Horse Barn

Swallow-Hopkins Office Building

Winton School

*Previously identified by Marvin Lamppa.
#Previously identified by Charles Aguar.

HIBBING

Blessed Sacrament Church

Remington Home

Rockwell Home

St. Leo's Convent

Blacklock Home

Redfern Home

St. Michael's Orthodox Church

Agadah Achim Synagogue

Power Home

Gannon Home

Old Post Office

1st Avenue Pharmacy

Carson Exploration Company

Coob-Cook School

Park School

Memorial Building

Howard Street Mall

Homer Theater

Gopher Theater

State Theatre

Brooklyn Theater

Anderson Garage

Befera Home

Nelson Location

Hendrickson Home

Sandberg Building

Congdon Building

Hibbing Hotel

Mesaba Ore Building

Canelake Cafe

Coons Building

Hibbing Produce

Mesaba Transportation

Cleveland Cliff Building

Hanna Mining Company Building

Planetarium

County Court House

Ryan Home

Hooper Home

Oliver Apartments

Belmont Apartments

Iron Range Committee Report

Accepted	Rejected	Tabled for More Information or Passage of Time (50 year suggestion)	Accepted with direction to SHPO to continue conversations with owner
(All those sites not found in columns 2-4)	Iron Range Brewery Northern Hotel Merritt State Bank Congregational Church Old State Theater Grace Lutheran Church Rex Bar and Hotel Milford Mine	Burntside Lodge Slovenian Home All Steel Home Dupont Powder Plant	Kearney's Saloon Shirt Factory (Virginia) Interurban (Virginia and Hibbing portions) Androy Hotel Great Northern Iron Ore Properties Building